WORKSHOP REPORT

Cross-border Collaboration and Portfolio Management of Research Infrastructures

DUBLIN, 30 AND 31 JANUARY 2017

SCIENCE EUROPE
Shaping the future of research

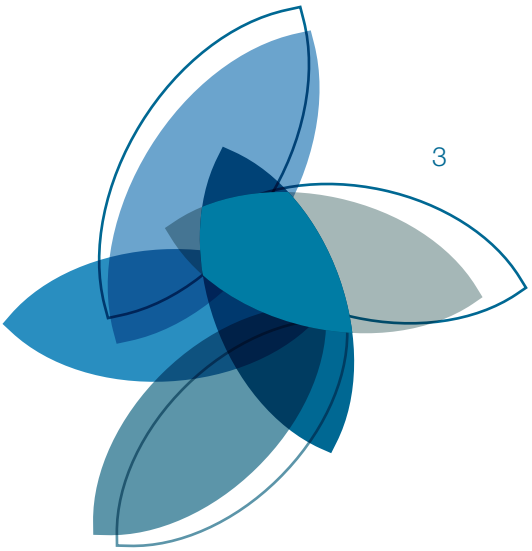
September 2017

'Workshop Report: Cross-border Collaboration and Portfolio Management of Research Infrastructures': D/2017/13.324/7

Author: Science Europe
For further information please contact Science Europe Office:
office@scienceeurope.org

Cross-border Collaboration and Portfolio Management of Research Infrastructures

WORKSHOP ORGANISED BY THE SCIENCE EUROPE WORKING GROUP ON RESEARCH INFRASTRUCTURES



Introduction

Science Europe published its Survey Report 'Strategic Priorities, Funding and Pan-European Co-operation for Research Infrastructures in Europe' in January 2016.[1] This report gives insight into the diversity of processes in place to define strategic priorities across different national research systems, and describes the decision-making landscape of planning, funding, and collaboration of Research Infrastructures (RIs) therein. It also proposes 15 recommendations to foster the development of a stronger RI base for the European Research Area, presented in four categories: landscape analysis and strategic priorities; assessment procedures; funding of RIs; and international co-operation.

To build on this work, the Science Europe Working Group on RIs organised the workshop 'Cross-border Collaboration and Portfolio Management of Research Infrastructures' on 30 and 31 January 2017 in Dublin, Ireland, co-hosted by Science Foundation Ireland and the Health Research Board. It aimed to further explore the challenges facing Science Europe Member Organisations (MOs), and for research funding and performing organisations in general, to:

- design and manage balanced RI portfolios – what approaches are developed and adopted to balance the support to (i) existing vs. emerging RIs, (ii) national vs. international RIs, (iii) RIs of different sizes, and those serving different communities; and

- design effective cross-border collaborations when setting up and running joint RIs.

This exploratory workshop addressed members of the Science Europe Working Group on RIs, senior officials from Science Europe MOs and representatives of various RI-related initiatives from across Europe. It led to the identification of lessons learned and possible ways forward. The key points discussed during the workshop are summarised in this report, starting with a review of discussions on Portfolio Management and followed by the report of discussions on Cross-border Collaboration.

Portfolio Management of Research Infrastructures

The first part of the workshop aimed to foster mutual learning on RI portfolio management and existing mechanisms to balance funding for:

A. existing vs. new RIs (including decommissioning aspects);

B. national RIs vs. international RI participation (including the evaluation of a country's return on investment in international initiatives); and

C. RIs for different research areas, sizes, and formats.

RIs are long-term investments, but most organisations (if not all) have a limited budget. As a consequence, Research Funding Organisations (RFOs) and Research Performing Organisations (RPOs) need to optimise their budgets, in order to ensure that suitable support for RIs exists. Discussions from the three title sessions above are reported in the following sections.

A. Balancing Out Support for Existing vs. Emerging Infrastructures

Janet Seed from the Science and Technology Facilities Council (STFC) in the UK, presented the STFC's prioritisation framework,[2] which is used for all programmes run by the organisation, including RIs. It consists of:

1. A strategic review of a specific subject area, which can be an infrastructure provision, such as neutron science, Free Electron Lasers,[3] or computing.

2. Programme evaluations – within a programme area, such as particle physics.

3. A balancing of programmes – across related activities, such as particle physics, nuclear physics, and astronomy.

Based on the STFC approach and experience, Seed flagged relevant aspects that could be considered and/or adapted by others when balancing out support to their existing vs. emerging infrastructures. She highlighted that:

- A long-term vision is needed for the research that will be carried out at a specific RI: it is essential to (i) understand the research community's long term vision of the future of their fields and (ii) go beyond the 'more of the same' approach.

- Operators of existing facilities are the experts on how their facilities could develop. The challenge is to identify suitable experts who could provide additional advice on what new capabilities and technologies the infrastructures could offer.

- Sustainability of RIs needs to be balanced with responsiveness to new opportunities. The risk in making RIs highly sustainable and secure is that it can become difficult to close them. Political considerations will come into play: it is crucial to ensure that RIs remain consistent with bottom-up priorities.

- The interests of different constituencies or bodies, such as host countries, research communities, industry, or other users, must be weighted.
- Funding for capital construction, operations, and decommissioning might not be equally easy to access, and may have to come from different bodies.
- When considering decommissioning costs and other liabilities, one must assess whether it is too expensive in the short term to close down an infrastructure.

Participants were then invited to consider the following questions:

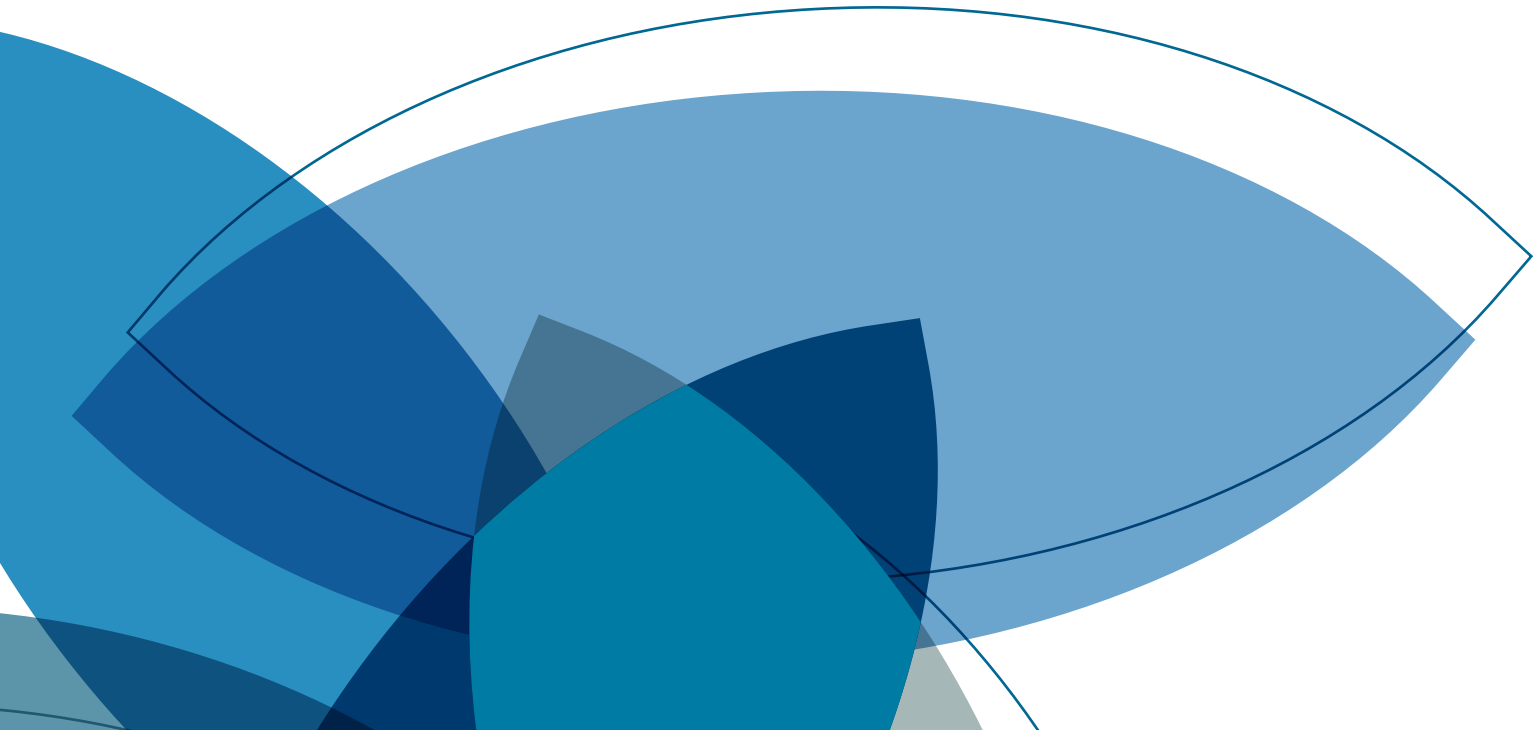
1. How are funding decisions made in your country when support is required for existing and new RIs? Is there a central (national) plan in place that guides the decision to support new or existing RIs?
2. Is it the responsibility of each RFO to decide what RIs to support – particularly in relation to existing vs. emerging infrastructures?
3. Is there a themed or targeted approach taken by each RFO? Does each one have specific domains that are targeted?

A diverse range of approaches and mechanisms were discussed during the break-out and plenary sessions and the following points are a summary of those discussion. For example, most research organisations assess their portfolios and strive to ensure a balance between new and existing RIs via monitoring and evaluations.

For the research organisations that do not fund running costs, existing and new RIs compete for funding only when support for an upgrade of existing RIs is applied for.

In other countries/organisations, a bottom-up principle solely applies, and the balancing of the RI portfolio spend there is based on available funds only.

When organisations proceeded with closing down RIs in the past, the main triggers for the closure were concerns expressed following a review of the facilities, the development of a more advanced RI in a similar field, or the lack of interest from within the national research institutions involved.



B. Balancing Out Support for National vs. International Infrastructures

Magnus Friberg from the Swedish Research Council (VR) presented how VR mapped the benefits of VR membership in international organisations for Swedish research. He also presented a scheme that allows for the monitoring and comparison of International Research Infrastructures (IRIs) with national infrastructures.[4]

The primary aims of VR's ongoing initiative are to:

- describe Swedish return of VRs memberships;
- provide a basis for evaluating if VR funding is well spent;
- test a monitoring process of IRIs, in order to enable comparisons with national RIs; and
- evaluate each membership on its own merits (the approach will not result in a ranked list based on metrics).

The initial collection of data was completed in January 2017 and encompasses data on RI's and IRI's backgrounds, publication statistics, economic data (in-kind/procurement; user fees; academic/commercial), and users (Swedes/total; men/women; academic/commercial). The strategic analysis primarily consists of further consultations with universities, institutes, VR's Boards and panels in order to:

- relate their strategic agendas to VR's membership in IRIs;
- discuss with their RI users;
- identify potential 'homeless' communities (not catered for by any RI or IRI); and
- propose alternative solutions.

Participants were then invited to consider the following questions:

1. What is your understanding of the term 'International Research Infrastructure'?

2. Is there a process in place to prioritise national and international RIs? If yes, is the categorisation theme driven?

3. What level of 'national impact' is required when deciding to fund RIs of an international nature?

The ensuing discussions revealed that evaluations of national RIs and IRIs are often similar and rely on the collection of data on publications, engagement/contracts with industry, wider societal impact, the level of alignment to the national strategy, the value for money for national researchers, the access and services for the relevant scientific community and the extent to which IRIs provide opportunities that are not available through national RIs.

One organisation is currently developing a new model for general administrative oversight of its memberships of IRIs (primarily for Big Science facilities), that is built on three pillars: controlling, governance, and policy.

For some organisations, the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap plays a key role when considering the balance between national RIs and IRIs. In those countries IRIs are compared based on the national contribution to (the design and preparatory phases of) the IRI.

Some organisations secure their IRI investments through national projects and consortia from several research institutions, in order to instil a sense of national ownership.

C. Balancing Out Support to Infrastructures of Different Sizes, Serving Different Communities

Randy Phelps from the National Science Foundation (NSF) in the USA introduced the existing NSF RI-related programmes that are based on both multidisciplinary needs and scale:

- For small-scale facilities, there are few remaining discipline-specific instrumentation programmes; for these, NSF runs a foundation-wide 'Major Research Instrumentation' (MRI) programme;
- For large-scale facilities, NSF runs a foundation-wide 'Major Research Equipment and Facilities Construction' (MREFC) account.
- For mid-scale facilities, there are very few discipline-specific 'in-between-scale' (mid-scale) activities; currently, NSF has no foundation-wide mid-scale activity.

Participants were then invited to consider the following questions:

1. Are different RFOs responsible for different RIs in relation to the scale/size of the RI?

2. Is the funding of large-scale RIs decided at national or RFO level?

3. Regarding small-, medium-, and large-scale RIs does the RPO community provide direction on which RIs to fund? Do RPOs have 'more say' in the support of small-scale RIs rather than larger-scale facilities, or vice-versa?

The responsibility of funding RIs in relation to their scale varies from one country to another. One influencing factor is the size of a given country and its budget, which obviously determines the level of funding available; another factor is the type and number of organisations in charge of giving out the funding. For example, in some countries there may only be one RFO. Also, in some countries, mid-scale could relate to an investment of €15 million, while in others this may be considered a large-scale investment. It is complex and case-dependent.

Workshop participants suggested that funding decisions could be made as follows: by one (or more) ministry(ies) for contribution to IRIs; by RFOs for large- to medium-scale facilities, (especially when a roadmap exists); by RPOs for smaller-scale facilities.

Discussion Outcomes

When discussing possible ways of reaching an optimal portfolio of RIs, workshop participants suggested that relevant parties might consider the following:

- Organise strategic reviews of specific research fields, in which researchers and stakeholders identify future RI needs (including e-Infrastructures) and anticipate future research questions. Such reviews could result in roadmaps or white papers, flagging priorities, not just wish lists.

- Develop support/funding schemes tailored to the scale of the facilities (see Recommendation #9 on page 26 of the above-mentioned Science Europe Survey Report[1]).

- Explore the relevance and feasibility of evaluating existing and new, national and international RIs (including e-Infrastructures) in parallel and using the same criteria.

- Investigate the launch of national calls to meet specific ESFRI commitments.

- Facilitate closer collaborations between RFOs, RPOs, and industrial partners.
- Request RIs to develop business plans (see Recommendation #7 on page 24 of the above-mentioned Science Europe Survey Report[1]).

Given the exploratory nature of this workshop, the above points are not a consensus, but instead are meant to inform possible future reflection and work on the concept of RI portfolio management.

Cross-border Collaboration for Setting Up and Running Research Infrastructures

Introduction

Research Funding Organisations and Research Performing Organisations are often confronted with requests from scientific communities for Research Infrastructures that they cannot fully fund or even support. The design of Cross-border Collaboration (CBC) initiatives could enable them to support a broader range of RIs; noting that not all types of facilities would be set up in every country.

CBC will not increase the total access time per se, but from the perspective of funders and managers, it would allow access to a broader range of scientists (per RI), and from the perspective of the scientists, it would allow access to a broader variety of RIs.

The setting up of ESFRI projects and other IRIs relies on CBC models. Such models can also be implemented on a sub-ESFRI level (i.e. for facilities requiring less capital investment and less running costs, and those that are less 'complex'); they can involve a smaller numbers of partners; and they can start from bilateral CBC agreements.

For the purpose of this workshop, CBC for RIs was considered:

- at sub-ESFRI level, i.e. for actions smaller in terms of budget and/or complexity than ESFRI projects; and
- as different from the CBC efforts of Science Europe Member Organisations for standard project funding. This distinction between CBC for RIs and multi-lateral project funding derives from RI-specific requirements (such as long-term agreements, governance, management, business plans, and access rules) that typically go far beyond the requirements of project funding.

Three presentations helped set the scene for further discussion:

Christian Renner from the German Research Foundation (DFG) presented the results of a preparatory inquiry among members of the Science Europe Working Group on RIs. There is a general openness to CBC on RIs, usually in the context of regular programmes or national roadmaps. Linking CBC initiatives to roadmaps implementation may turn out to be challenging, considering that national roadmaps are developed in an asynchronous manner. "Funding RIs abroad is generally not seen as a problem, as long as access for scientists from the funding country is provided", he said. Previous cases of CBC on RIs have mostly been initiated bottom-up, i.e. by the respective research communities.

Harald Schwalbe from Frankfurt University in Germany and co-ordinator of several transnational access networks (e.g. Integrated Infrastructures Initiative, I3-projects), emphasised the need for CBC at all levels. The small number of examples for CBC on RIs (but also for 'Money Follows Researcher' and related mechanisms) could be an indication that barriers exist, even if they are not explicitly stated. "Regarding the initiation of CBC, past examples show that willingness for CBC cannot be taken for granted", he said.

Sverker Holmgren from the e-Infrastructures Reflection Group (e-IRG) reported on his experience in the field of e-infrastructures, notably the work of e-IRG. Initiatives in this area have been successful both prior to and outside of the ESFRI process (e.g. GÉANT, the pan-European Network of National Research and Education Networks), or as part of the ESFRI Roadmap (e.g. PRACE, Partnership for Advanced Computing in Europe). E-infrastructures are an underlying basis for research in general and for specific RIs; however ensuring their ownership by scientists as 'end users' remains challenging. He explained that experience so far shows that solutions at the national level should be a first step before engaging heavily on a European level.

Discussion on Benefits and Barriers for Cross-border Collaboration

The subsequent discussion on benefits and barriers for CBC on RIs resulted in partially heterogeneous results. Participants' opinions on the drivers for CBC on RIs were diverse:

- Some thought that RFOs were the drivers, whereas others saw RPOs and scientific communities as the drivers.
- Drivers for CBC on RIs include, among others: science diplomacy, the existence of RI roadmaps, and the inclusion of a specific RI in the roadmap.

The matter seems to call for further joint reflection from both RFOs and RPOs.

Higher visibility and quality for the RI and improved cost efficiency, were mentioned as potential benefits of CBC on RIs.

The very initiation of CBC on RIs often seems to be a barrier. It was expressed that there is need for a platform to ease the initiation of CBC; the facilitation of so-called 'sandpit exercises' – free thinking fora to uncover innovative solutions for a given issue – might help to advance initiation. Although only a small number of cases were reported, there was a feeling that CBCs currently come to realisation via varied ad hoc practices, at least in some countries.

Participants also discussed a hypothetical case of CBC on RIs – using the example of an integrated structural biology centre in Europe, with unique capabilities that make it attractive for US scientists as well – involving five potential partner organisations. In this hypothetical scenario, it turned out that three of the prospective partner organisations would be able to decide by themselves to join the CBC, while

the other two would need to involve their government (via national roadmaps). Regarding the types of costs and funding required, the five partners could each fund a range of costs, from construction to running costs and access fees for users. In-kind contributions would likely play a major role in the financial model; especially relating to staff secondment.

There was a general consensus, or a preference, to select RPOs (notably universities) as legal partners for the RI. RFOs can encounter more difficulties when entering formal agreements and will often hesitate to take over legal responsibility. Despite major differences in the procedures, timelines seemed comparable for all partners: a two-year period would likely be required for each partner to formalise the CBC via a Memorandum of Understanding (MoU). Decisions on funding would take an additional one to two years.

Discussions indicated that the overall time horizon of three to five years still holds, even when the CBC initiation and funding decisions are made simultaneously. It was also generally agreed that following the initiation phase, more partners and more users should be recruited to increase visibility and impact. No distinction was made between European and International CBC on RIs.

For the hypothetical case, it was assumed that the scientific case was sound enough and undisputedly supported by the involved communities. Should the need for community building or for a refinement of the scientific case arise, this would indeed induce further delays to the CBC initiation.

Conclusion

The discussion of the hypothetical case demonstrated that the initial steps of negotiating CBC on RIs can be fairly straightforward, as long as partners are willing to engage and can rely on a sound scientific case. However, difficulties are likely to arise along the way from the CBC idea, to its realisation. The initial hurdle, however, seems to be the identification of a worthwhile CBC opportunity.

During the final plenary discussion, CBC on RIs was strongly supported as a useful and beneficial enterprise. CBC should however not be considered as an end per se; instead, the expected benefits for all parties involved should be carefully and routinely assessed. Multilateral agreements should be designed so that they do not conflict with national regulations.

A platform for identifying opportunities for CBC is needed. Comparison of national roadmaps could help support the identification of CBC options. A sound scientific case for the CBC on RIs is a prerequisite and RFOs might act as facilitators or catalysts on the matter.

Notes and References

1. See http://scieur.org/rif-survey
2. STFC's Programme Evaluation: http://www.stfc.ac.uk/about-us/our-purpose-and-priorities/planning-and-strategy/programme-evaluation/
3. Free-Electron Laser (FEL) Strategic Review: http://www.stfc.ac.uk/files/fel-report-2016/
4. For more information on VR's work on RIs: https://vr.app.box.com/s/ok27iqpqrsemol5i087lfnbdd3w6ud9i

Annex

Monday 30 January 2017 // Dublin Castle

11.40 Opening

- **Michael Ryan**, Science Foundation Ireland
- **Darren Morrissey**, Science Foundation Ireland
- **Maud Evrard**, Science Europe

Workshop Objectives and Expected Outputs

- **Sofie Björling**, Swedish Research Council
- **Christian Renner**, German Research Foundation

12.00 **Design and Management of Research Infrastructures Portfolio**

Balancing Out Support to Existing vs. Emerging Infrastructures

Moderator **Kas Maessen**, Netherlands Organisation for Scientific Research

United Kingdom Case Study
Janet Seed, Science and Technology Facilities Council, United Kingdom

Breakout Group Discussions, Feedback and Plenary Discussion

Balancing Out Support to National vs. International Infrastructures

Moderator **Sonny Rathod**, Biotechnology and Biological Sciences Research Council, United Kingdom

Swedish Case Study
Magnus Friberg, Swedish Research Council

Breakout Group Discussions, Feedback and Plenary Discussion

Balancing Out Support to Infrastructures of Different Sizes, Serving Different Communities

Moderator **Sofie Björling**

United States Case Study
Randy Phelps, National Science Foundation, United States

Breakout Group Discussions, Feedback and Plenary Discussion

Take-home Messages and Possible Ways Forward
Sofie Björling

Introduction to Day 2
Maud Evrard

Programme

Tuesday 31 January 2017 // Dublin Castle

09.00 Opening of Day 2
Maud Evrard

09.30 **Cross-border Collaboration for Setting Up and Running Research Infrastructures**

Setting the Scene

Moderator **Christian Renner**

Science Europe Member Organisations' Approaches to Cross-border Collaboration
Christian Renner

Cross-border Collaboration in Research Infrastructure Networks and Consortia
Harald Schwalbe, Frankfurt University, Germany

eInfrastructures' Experience with 'Cross-border' Collaboration
Sverker Holmgren, eInfrastructures Reflection Group (eIRG)

Preconditions and Barriers to Cross-border Collaboration

Moderator **Christian Renner**

Introduction to Discussion Topics
Christian Renner

Breakout Group Discussions on:
- Preconditions and barriers to cross-border collaboration
- A hypothetical case of envisaged joint investment for a given facility

Feedback from Breakout Groups and Plenary Discussion

Workshop Conclusions
Michael Ryan

Science Europe is a non-profit organisation based in Brussels representing major Research Funding and Research Performing Organisations across Europe.

More information on its mission and activities is provided at www.scienceeurope.org.

To contact Science Europe, e-mail office@scienceeurope.org.

Science Europe
Rue de la Science 14
B-1040 Brussels
Belgium

Tel +32 (0)2 226 03 00
Fax +32 (0)2 226 03 01
office@scienceeurope.org
www.scienceeurope.org