ENVRI Common Operations of Environmental Research Infrastructures

ENVRI

Services for the Environmental Community

ENVRI Sustainability Summary

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Purpose of the ENVRI Sustainability Summary

This ENVRI Sustainability Summary is a condensed version of the ENVRI Sustainability Document, produced in May 2014. The ENVRI Sustainability Document describes the benefits of the ENVRI project results and analyses the most viable alternatives for sustaining the project outcomes. This Summary concentrates on the most significant conclusions and recommendations and is mainly intended for European and national policymakers as well as people involved in managing and developing current and emerging Research Infrastructures.

ENVRI at a glance

The ESFRI Environmental Research Infrastructures are constructing a major part of the European research landscape in environmental science for the coming 20 to 30 years. Realising this potential will ensure that the scientific community derives full value from investments in these large-scale environmental projects, and will keep scientists at the forefront of global research as they tackle the scientific challenges ahead.

The ENVRI project, “Common Operations of Environmental Research infrastructures” is a collaboration effort in the ESFRI Environment Cluster, with support from ICT experts, to develop common e-science components and services for their facilities.

ENVRI targets a few priorities of common interest for the ESFRI Environmental Research Infrastructures projects, with the key objectives to:

1. Develop and maintain a common policy for the ESFRI Environmental Research Infrastructures;
2. Design guidelines for a Common Reference Model to promote infrastructure interoperability;
3. Provide common solutions for data discovery, data integration and harmonisation for the infrastructure projects.

Why sustaining the ENVRI project results?

The success of ENVRI has been enhanced by including IT partners into the consortium even if they are not directly part of Environmental RIs. The main aim of sustainability planning in ENVRI is to make sure that the project outputs are taken to the next level and put in a bigger context for further development and operational use within the Research Infrastructures.

A major benefit of the ENVRI work is the development of strategic policy level collaboration between the Research Infrastructures. Lack of co-operation in long-term goals is seen to be a major drawback, hindering use of the RI products and their development. Even more importantly, the lack of organised high-level collaboration in Earth System sciences, have lead to difficulties in answering key societal challenges. One of the crucial outcomes of the ENVRI project is the increased level of dialog and institutional co-operation between Research Infrastructures. ENVRI gives the opportunity for the Research Infrastructures to create a joint vision and to speak with a common voice to express the needs and aims of the Environmental sector. Collaboration on policy level additionally reduces the risk of overlap and duplication of work and facilitates identification of gaps.

This dialogue and alignment of work is further improved by the ENVRI Reference Model (ERM), hosted at www.envri.eu/rm, which contributes to the development of a common language with agreed concepts and definitions – the basis for achieving a common understanding. The ENVRI RM is key to maintaining interoperability between the research infrastructures on the system level. Also the development of technologies in ENVRI has as the guiding principle to tackle issues that are common to the Environmental RI cluster. The data discovery, access and visualization tools that the project has produced enhance the possibility of multi-disciplinary environmental science. This supports in a concrete way the vision for Environmental RIs created by the ENVRI policy activities.

The described common approach deriving from the strategic collaboration, the ENVRI Reference Model and joint technical solutions additionally contributes in making Environmental sector more approachable for the stakeholders.

How to sustain the results?

The various outputs of the ENVRI project all have different outlooks for sustainability. However, all of them depend ultimately on the need and interest of the Research Infrastructures to adopt, use, develop, support, and/or endorse these results.

The ENVRI RM is dynamic by its nature and would additionally benefit greatly from user involvement in its further development. This naturally requires commitment from the customer community side supported preferably with public funding. It is important to underline that the ENVRI RM is not limited to the environmental field, but applicable to Research Infrastructures in general. Investments to the ENVRI RM development thus have the potential for an even wider impact on European research. The maintenance of the ENVRI Reference Model would also benefit from further community efforts, possibly through Research Data Alliance.

The sustainability of the project outcomes is also strongly supported by the fact that these are based on open source technologies, open standards, and open interfaces (the technical tools); and distributed under open licensing (the ENVRI Reference Model). The main developers of the technical outcomes plan to continue with the technologies, meaning that there is a strong competence center available ensuring continuity of the technologies.

In summary, three main methods to utilize and adopt Reference model, tools and technologies developed in ENVRI project can be identified, namely

1. *'As a service model'*: The RIs acquire the functionality they require from an external service provider
2. *Open source model*: The RIs take the technology and deploy it within their operations
3. *Collaborative model*: The RIs and ICT providers further develop and setup services in a collaborative effort

The three models are not exclusive. Instead, the approach at each RI is probably a combination of two or three models. Important note on the *as a service* model is that the current ENVRI partners can conveniently act as such providers of contracted services.

Particularly, the collaborative model can be said to be crucial for the future success of the Environmental Research Infrastructure cluster, because in absence of collaboration the activities towards interoperability and integration of data will be more difficult which will slow down the progress of Environmental science.

European e-infrastructures such as EGI and EUDAT provide many services that are suitable for the current and emerging Environmental Research Infrastructures. Involving these in providing platforms and services for RIs will in many cases be very beneficial, especially what comes to data discovery and access across research infrastructures. The e-infrastructures are in a position to provide platforms across user communities and operate them in a cost-effective manner.

Final Recommendations

1. Collaboration of ESFRIs on Environmental cluster should be extended beyond the current ENVRI project in order to continue policy level discussion between the partners and to form a joint interface towards major European and international initiatives.

2. The ENVRI project is an excellent basis for the cooperation of environmental research infrastructures in support of advanced interdisciplinary research addressing the grand challenges of our changing environment. Next steps are required to benefit from the added value as developed in ENVRI.

3. To facilitate the creation of the above, and to allow further development of technical results and the ENVRI reference model, as well as their transfer to production use, an EC funded follow-up project to ENVRI from 2014 onwards is needed.

4. The ENVRI Reference Model is seen as highly beneficial tool for the RIs to plan, manage and develop their operations. The maintenance and further development of the ERM should be secured by collaborative efforts preferably under public funding.

5. The ICT developers are willing to continue the technical development for Environmental cluster, but the adoption of ENVRI outcomes at the Research Infrastructures requires action from the RIs themselves. To support the adoption and sustainability of ENVRI technical results, three alternative models are presented (as a service, open source, and collaborative). Based on this study, these models are feasible both for RIs and for ICT partners, and thus can form the basis for discussion on the form of future collaboration.

6. The capabilities for inter-disciplinary platforms and cost-effective solutions from European e-infrastructures should be used and exploited when possible.

