

Deliverable 2.1: Legal Entity Analysis

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1. Purpose of the document

The purpose of this document is to study what kind of legal entity model would best suit for the ACTRIS RI and what kind of synergies and cooperation possibilities there might be with other research infrastructures. The purpose is not to study all existing legal forms, their benefits and disadvantages for a research infrastructure but focus on ACTRIS RI and its needs. ACTRIS RI is a larger and complex infrastructure and in order to function most efficiently it needs a strong management structure and legally binding commitments from countries as well as active involvement of them to maintain its activities sustainably.

2. ACTRIS legal entity

2.1. Different possibilities for a legal model

There are in principle two kinds of ways to establish a legal model for a research infrastructure: a contractual model and a legal entity model. The contractual model is based on an agreement between the parties involved. The contractual model is a relatively simple and fast way of creating commitment for cooperation and in the field of research there are organisations in Europe that cooperate only through contractual basis, for example, joint research units, institutes and research centres in France or Germany. Usually, however, the contractual model is considered as the first step aiming towards a more permanent and more legally binding commitment. The ACTRIS RI also is already functioning on contractual basis at the European level, e.g. via the ACTRIS preparatory phase project consortium agreement and country collaboration stated in the Letter of Intent for the Interim ACTRIS Council, and at the national level many research organisations have established joint research units or national ACTRIS consortia. This document is analysing more permanent and sustainable legal model options for the ACTRIS RI.

For legal entity models there are different kind of options. You can create an international organisation, an entity under the European legislation or an entity under the national legislation.

2.1.1. International organisations

International organisations can be established under international legislation, like for example the CERN <https://home.cern>, or under national legislation, like for example the FAIR GmbH <http://www.fair-centre.eu/>. International organisations are established by states through an intergovernmental agreement but the involvement of national legal entities representing the states is needed as well to run the activities. The ratification and establishment process in the states involved is often long lasting and several kind of documents such as by-laws are needed. Privileges such as tax exemptions can be negotiated and included.

2.1.2. Entities under the European legislation

Under the European legislation there are several options for a legal entity. First there is the EEIG (European Economic Interest Grouping) <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1501747025958&uri=CELEX:31985R2137>. This is, however, meant for facilitating and developing the economic activities of its members by pooling resources and improving or increasing the results of those activities, and not so much intended for non-economic activities. There is also one important disadvantage of the EEIG legal model as the members have unlimited joint and several liability towards third parties for the debts of the grouping which can make it impossible for some states or organisations, especially public bodies, to join.

The European company <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1501747136712&uri=CELEX:32001R2157> is also basically meant for commercial field and companies, not for research infrastructures that mainly function on a non-economical basis. Also the EGTC (European grouping of territorial cooperation) <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32006R1082> would not seem to be fitting for pan-European research infrastructures for its specific aims and characteristics.

As above mentioned legal entity models are not optimal for research infrastructures, a specific legal entity model, the ERIC (European Research Infrastructure Consortium) <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464858763037&uri=CELEX:32009R0723>, has been created. It gives a legal capacity, which is recognised in all EU member states, and the possibility also for non-European countries to join as members. The members of an ERIC can be EU member states, associated countries, third countries and intergovernmental organisations. Exemption for VAT and excise duty is available as well as the possibility to adopt own procurement rules. The establishment process of an ERIC is often faster than creating an international organisation, but the same way as in case of an international organisation, several by-laws are usually needed in addition to the founding documents. The governance requirements include the assembly of members and director or board of directors as the legal representative. ERIC functions under the European legislation and under the legislation of the state where the statutory seat is located. An ERIC is mainly set up for non-economic purposes and can carry out only limited economic activities related to its principal task. Most of the ESFRI RIs have adopted the ERIC as legal status or are in the process to establish an ERIC. At the moment, 16 ERICs have been established https://ec.europa.eu/research/infrastructures/index_en.cfm?pg=eric-landscape.

2.1.3. Entities under the national legislation

Under the national legislation there is the possibility to establish private companies either with limited liability or unlimited liability or one can choose a non-commercial and non-profit organisation form such as for example an association, model chosen for example for the IAGOS-AISBL <http://www.iagos.org/>, or a foundation. Unlimited liability in a company means that the shareholders are liable for their debts so that model has an important disadvantage and would make it impossible for some public organisation partners to join.

Different countries have different legislations but there are also a lot of similarities so all these models are probably available in all European countries in some form. The establishment of an entity under national law can be a rather quick and simple process, and the compulsory requirements are often rather small. In Finland, for example, the minimum requirements for governance in a limited liability company in addition to the assembly of shareholders is the board of directors, and the minimum share capital for a private company is 2.500 euros and for a public company 80.000 euros <http://www.finlex.fi/en/laki/kaannokset/2006/en20060624>. For a foundation in Finland, the minimum original capital is 50.000 euros, the minimum requirement for governance in addition to the assembly of shareholders is the board of directors and the foundation can carry out limited economic activities related to its task or other economic activities stated in its founding rules <http://www.finlex.fi/fi/laki/alkup/2015/20150487>.

The difference compared to an international organisation under national legislation is that in these models also the legal entities, like research institutes or universities, can be members, not only states. As there often are quite detailed legislations available, especially concerning limited liability companies, there is less need for several by-laws, but on the other hand the flexibility to establish own rules is lacking.

Considering the above mentioned legal entity models available, the most suitable legal models for a research infrastructure would seem to be an international organisation, company, foundation or association under national legislation or an ERIC.

Setting up an international organisation requires a lengthy process, especially ratification of the international organisation in all the participating countries can be a long process. As ACTRIS is aiming at setting up the legal entity as soon as possible, a quicker process is preferred.

A legal entity under national legislation is usually used if the partnership is dominated by one or several partners in one country or the activities are carried out mainly in one country or in few countries and this is not the case in the ACTRIS with more than 20 countries involved. A legal entity under national legislation, like for example IAGOS-AISBL, would also not seem to be very applicable for large and complex infrastructures. The benefits and disadvantages of a legal entity under national legislation on the other hand depend on the specific national legislation of the decided seat country of the ACTRIS RI. So the implications of this model could only be studied after the seat country is chosen.

The ERIC has been created especially for the Pan-European research infrastructures and it can include many countries as members. It has also been chosen as the legal model by several ESFRI RIs so has been already tested in many cases in Europe. Thus in the following chapter the ERIC as a legal model for the ACTRIS RI is described in more detail.

2.2. ERIC as a model for the ACTRIS RI

The ERIC regulation was adopted in order to facilitate the establishment and the operation of large European research infrastructures among several member countries and associated countries by providing a new legal instrument, the European Research Infrastructure Consortium (ERIC). The ACTRIS RI, being a complex distributed Pan-European research infrastructure with many member countries involved, is perfectly suited for adopting the ERIC regulation as a legal entity when the ACTRIS RI is progressing beyond its present preparatory phase project status.

The ACTRIS RI requires a firm legal framework for its construction (2019–2021), pre-operation (2021–2025) and operation (2025–) phases. The ACTRIS RI has evolved and matured over a number of years and includes National Facilities in 21 European countries with more than 80 observational and exploratory platforms, comprising field stations, simulation chambers and mobile platforms distributed widely across Europe, and also includes sites located outside Europe but owned and operated by European research performing organisations (e.g., in the Arctic, Antarctica, and the tropics). ACTRIS will have European-level Central Facilities across Europe. The scale of the ACTRIS services, size and distribution of the operations and number of member countries involved in the ACTRIS RI calls for a legal entity model that can deal with this level of participation and complexity. An ERIC as a model meets these requirements very well.

The ERIC regulation is accepted by all EU member states and recommended by the EU Commission as the first option to consider when establishing Pan-European research infrastructures. Through its structure, an ERIC automatically ensures the active involvement and commitment of the participating countries and not only research performing organisations, thus also safeguarding the long-term sustainability and funding that is absolutely essential for the ACTRIS RI.

According to a report from the workshop on Long term sustainability of Research Infrastructures, “Exploring RI’s full potential” arranged in November 2016 by the European Commission https://ec.europa.eu/research/infrastructures/pdf/Its_research_infrastructures_workshop_report.pdf#view=fit&pagemode=none, the capacity to address a global challenge requires an international approach as it is the most effective solution. For this purpose, the ERIC instrument was seen as one way of contributing to consolidate and strengthen the EU positioning in international initiatives.

Adopting the ERIC regulation is most likely the quickest route towards establishing a legal entity for the ACTRIS RI from the different options. The ERIC regulation has been extensively tested since its adoption in 2010, and the EU member states are by now well acquainted with the procedures for setting up an ERIC and how to handle possible related issues (VAT, excise duty, procurement, staff employment etc.).

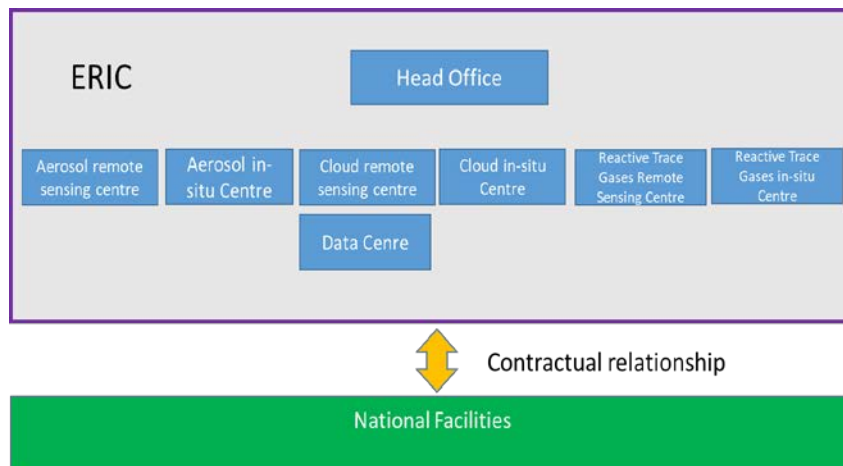
Adopting ERIC as a legal entity for the ACTRIS RI is a vital step towards firmly establishing the ACTRIS RI as a key atmospheric research infrastructure in the European RI landscape. With the ERIC as a legal entity, collaboration and alignment with other RIs in the environmental domain, such as for example ICOS ERIC and IAGOS-AISBL, can be established and formalised.

The preparatory phase project considers the ERIC to be the best legal entity form for the ACTRIS RI.

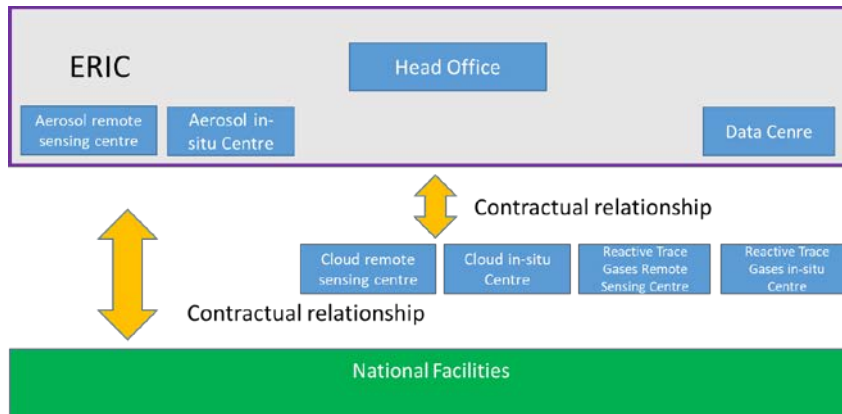
2.3. ACTRIS legal entity structure

The ACTRIS RI consists of National Facilities and Central Facilities. The Central Facilities are the European level key operative entities of the RI in charge of the service provision for the users, including quality assurance and quality control of the ACTRIS measurements and provision of ACTRIS data, data products and tools. The Central Facilities include several Topical Centres, the Data Centre, and the Head Office. The National Facilities are observational and exploratory platforms operated at the national level for producing the ACTRIS data and offering physical access for users.

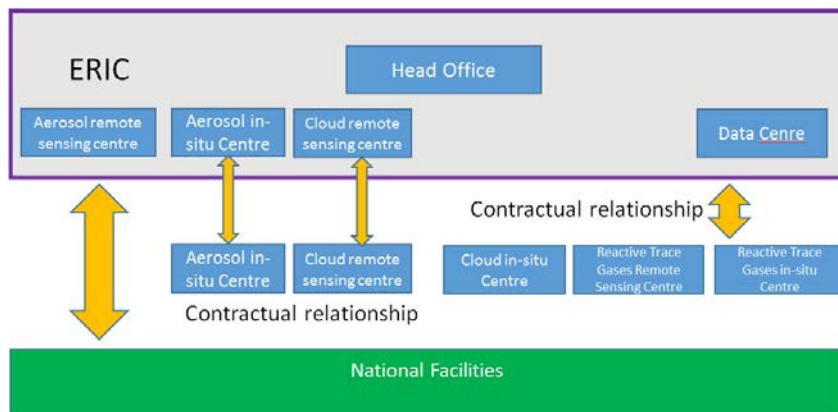
These components of the ACTRIS RI can be linked to the ACTRIS legal entity structure in different ways as shown below. The ERIC as a legal model has been taken as an example but in principle these options can be managed also in other legal entity forms. The options include: 1) all Central Facilities are part of the legal entity; 2) only some of the Central Facilities are part of the legal entity; 3) only some parts (nodes) of the Central Facilities are part of the legal entity; and 4) none of the Central Facilities, except the Head Office, are part of the legal entity.



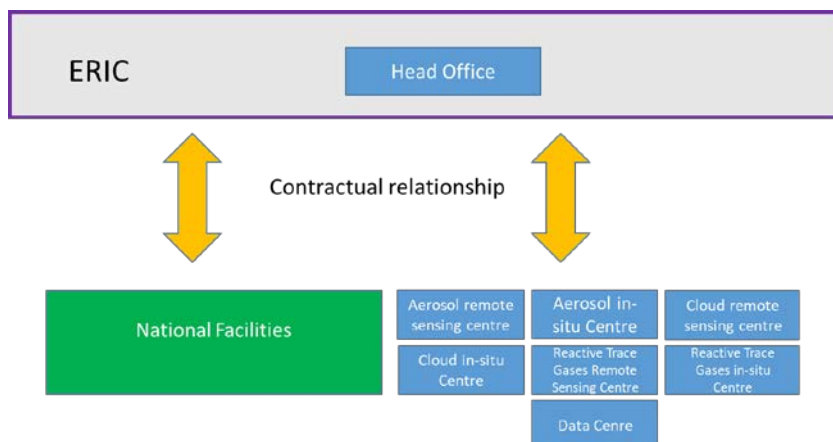
Option 1. All the Central Facilities are part of the legal entity



Option 2. Only some of the Central Facilities are part of the legal entity (an example)



Option 3. Only some parts (nodes) of the Central Facilities are part of the legal entity



Option 4. None of the Central Facilities, except the Head Office, are part of the legal entity

2.3.1. Option 1. All the Central Facilities are part of the legal entity

If all the Central Facilities are part of the ACTRIS legal entity, the funding of the Central Facilities is part of the ACTRIS legal entity budget and accounts, and they are managed by the ACTRIS legal entity. The member countries' and research performing organisations' contributions (funding and resources) to operate the ACTRIS activities are included in the ACTRIS legal entity budget and the resources needed in the Central Facilities are allocated by the ACTRIS legal entity based on the annual work plan.

The physical facilities of the Central Facilities can either be owned by the ACTRIS legal entity or by the hosting organisations. In case the hosting organisations own the physical facilities, the use of the facilities by the ACTRIS legal entity is negotiated and agreed upon between the hosting organisations and the ACTRIS legal entity.

The staff of the Central Facilities can either be fully or partially (for example the directors of the Central Facilities) employed by the ACTRIS legal entity as there is flexibility in terms of how the personnel is connected to the legal entity. The staff belonging to the ACTRIS legal entity are under its direct supervision and are ruled by both the ACTRIS staff policy and the applicable national legislation of either the country where the statutory seat is located or the Central Facilities are located. For those people that are not employees of the ACTRIS legal entity there are many options: the hosting organisations can employ the people in which case they could be in kind contributions to the ACTRIS legal entity, or they can be hired from a pool of local employees/personnel or through an open recruitment or secondment could be used.

From the governance point of view, option 1 implies that the directors of the Central Facilities have an executive role in the management structure with prominent role, rights and responsibilities under the direct supervision of the ACTRIS legal entity. Directors of the Central Facilities can be members of the board of directors if so defined. From the operations and the ACTRIS service provision point of view, option 1 gives strong executive role for the ACTRIS RI, as the service provision and operations can be planned and implemented in a coherent manner with a common strategy, work plan, budget and governance and management structure. The Central Facilities as part of the ACTRIS legal entity could enjoy all the benefits of the chosen legal entity (for example the legal entity's VAT and procurement rules) and would be fully part of the governance of the legal entity.

The appropriate liability and the required agreement for option 1 would depend on what kind of arrangements are chosen. For example, if the ACTRIS legal entity fully runs the activities so that it owns the premises and employs all the people, the ACTRIS legal entity would naturally be liable for everything. In case other arrangements are chosen, i.e., the personnel are only partly employees of the ACTRIS legal entity and the premises are not owned by the ACTRIS legal entity, the liability is divided accordingly depending on who is responsible and how and things need to be agreed upon in more detail in agreements made between the ACTRIS legal entity and the hosting organisations of the Central Facilities.

In option 1, the National Facilities are linked to the legal entity by contracts. These contracts need to define the obligations and rights of the ACTRIS legal entity and the concerned National Facility owners (e.g., the research performing organisations) to produce data and provide access in accordance with the

ACTRIS legal entity work plans, and policies and they need to be approved and signed by all independent organisations providing such services for the ACTRIS legal entity.

2.3.2. Option 2. Only some of the Central Facilities are part of the legal entity

In option 2, some of the Central Facilities are directly included through funding, budgeting, accounting, personnel and execution power into the ACTRIS legal entity and its governance and management structure as described in more detail in chapter 2.3.1. The other Central Facilities are linked to the ACTRIS RI operations by contracts which regulate the obligations and rights of the hosting organisations of the Central Facilities and the ACTRIS legal entity.

The finance of the Central Facilities that are not part of the ACTRIS legal entity is not part of the ACTRIS legal entity budget and accounts but is part of the budget and accounts of the hosting organisations. The cost and revenue structure of the Central Facilities has an impact on the agreements, liability, responsibility, financial reporting, etc. and the management activity is more complicated.

The directors and the staff of the Central Facilities that are not part of the ACTRIS legal entity are not under the direct supervision of the ACTRIS legal entity and are not working under the ACTRIS legal entity staff rules and policies. The directors of the Central Facilities that are not part of the ACTRIS legal entity are not part of the executive bodies of the ACTRIS legal entity. They can only have an advisory role in the RI committee. Their right to represent the ACTRIS RI is also weaker than if they were part of the ACTRIS legal entity executive bodies.

The Central Facilities not part of the ACTRIS legal entity cannot enjoy the benefits of the ACTRIS legal entity, including for example VAT exemption.

Detailed agreements are needed to regulate the obligations and rights between the organisations hosting the Central Facilities that are not part of the ACTRIS legal entity and the legal entity, including conditions on money flow from the ACTRIS legal entity to the hosting organisations, the management of the Central Facilities, the obligation to accept the ACTRIS legal entity policies as part of the hosting organisations' Central Facility activities, etc. The ACTRIS legal entity would be liable only for those activities that are under its management as described in chapter 2.3.1 so depending on the structure and arrangements chosen. The ACTRIS legal entity is not liable for activities run by the Central Facilities that are not part of it and the liability of the outside Central Facilities towards the ACTRIS RI is defined in the agreements.

The organisations running those Central Facilities that are not part of the ACTRIS legal entity need to make their own consortium agreement defining the operations of the Central Facilities and what are the rights and obligations of each participating host organisation.

The National Facilities are linked to the ACTRIS legal entity through contracts the same way as in option 1.

2.3.3. Option 3. Only some parts (nodes) of the Central Facilities are part of the legal entity

In option 3, a Central Facility may partly be linked to the ACTRIS legal entity through contracts and partly be part of the ACTRIS legal entity, meaning that one national node of the Central Facility, established by some national organisations, can be part of the legal entity and another node of the same Central Facility is not part of the legal entity.

Option 3, where one or some nodes of the Central Facility is a part of the ACTRIS legal entity and one or some nodes are outside the legal entity, is the most complex option and there are currently no examples of such a solution known among those research infrastructures established so far.

Option 3 is a mixed model and the implications are also complex and include many issues that need to be carefully taken into account, e.g., the involvement of the Central Facility nodes in the ACTRIS legal entity governance and management structure, as conflict of interest is easily existing, how to separate the funding, budget and accounting of the Central Facility between the ACTRIS legal entity and the participating host organisations. So several analyses prior to the adoption of option 3 should be worked out.

As described in chapter 2.3.1 and 2.3.2, the implications for the ACTRIS legal entity and the Central Facility would vary depending on how the structure and arrangements would be made. But one additional aspect would be that this mixed model would be challenging for the Central Facility to establish their management structure, and the representatives of the Central Facility could have a different status within the ACTRIS RI and in the ACTRIS legal entity.

The National Facilities are linked to the ACTRIS legal entity through contracts the same way as in option 1.

2.3.4. Option 4. None of the of the Central Facilities, except the Head Office, are part of the legal entity

In option 4, all the Central Facilities are linked to the ACTRIS legal entity through contracts the same way as the National Facilities. Only the Head Office, as being at the same time the statutory seat of the ACTRIS legal entity, would be part of the legal entity.

The implications in case a Central Facility is not part of the ACTRIS legal entity are described in detail in chapter 2.3.2 under the option 2 and they would now apply to all the Central Facilities.

The finance of the Central Facility is not part of the ACTRIS legal entity budget and accounts, but is part of the budget and accounts of the hosting organisations. In order to distribute any membership fee contributions to the Central Facilities, the cost and revenue structure of the Central Facilities and therefore annual financial reporting of the Central Facilities is needed.

The directors and the staff of the Central Facilities are not under the direct supervision of the ACTRIS legal entity and are not working under the ACTRIS legal entity staff rules and policies. The directors of the Central Facilities are not part of the executive bodies of the ACTRIS legal entity. They can only have an advisory role in the RI committee.

The Central Facilities cannot enjoy the benefits of the ACTRIS legal entity, including for example eventual VAT exemption.

Detailed agreements regulating the obligations and rights between the organisations hosting the Central Facilities and the ACTRIS legal entity are needed, including conditions on money flow from the ACTRIS legal entity to the hosting organisations, management of the Central Facilities, obligation to accept the ACTRIS legal entity policies as part of the hosting organisations' Central Facility activities etc. The ACTRIS legal entity is not liable for the activities run by the Central Facilities and the liability of the Central Facilities towards the ACTRIS RI is defined in the agreements.

The organisations running the Central Facilities need to make their own consortium agreement defining the operations of the Central Facilities and what are the rights and obligations of each participating host organisation.

From the operations and the ACTRIS service provision point of view, the option 4 means more coordination work and responsibility for the ACTRIS legal entity to ensure that the operations are planned and implemented in a coherent manner.

The National Facilities are linked to the ACTRIS legal entity through contracts the same way as in option 1.

2.3.5. Conclusions concerning the different options

Options 2 and especially 3 are rather complex and could be difficult to manage. Concerning the option 3, not all the implications are clear nor cannot be foreseen, but more detailed studies should be made.

Options 1 and 4 are the less complicated with rather clear implications. Within option 1 there is room for different kind of arrangements concerning staff and facilities and some sort of agreements are needed. Option 4, on the other hand, would mean that basically everything concerning the running of the ACTRIS RI would be defined and agreed upon in detailed agreements. As stated above from the operations and the ACTRIS service provision point of view, option 1 would mean a strong executive role for the ACTRIS legal entity and the Central Facility directors and the operations could be planned and implemented in a coherent manner. The preparatory phase project recommends option 1 as the best solution.

3. Collaboration and synergies with relevant ESFRI Infrastructures and other international collaboration activities

3.1. Collaboration with other RIs

The ACTRIS RI is a research infrastructure for the study of short lived atmospheric components which are relevant for both climate and air quality research. The ACTRIS RI provides access to high-quality data and physical access to large facilities and laboratories, including simulation chambers, to conduct excellence research in the atmospheric domain. In this respect, the ACTRIS RI is unique not only because it provides unique information, not covered by any other European RIs, but also because it is the only ESFRI RI in the atmospheric domain offering physical access to advanced facilities and laboratories.

Because of this specificity, the ACTRIS RI is organized based on a concept that fundamentally differs from other atmospheric RIs. Making an effort seeking synergies with other (environmental) RIs, wherever feasible and reasonable, can result in unprecedented scientific breakthroughs. However, as a general strategy, any initiative to integrate the ACTRIS RI into existing ERICs or other legal entities in the ENVRI (Environmental Research Infrastructure) domain is not recommended and independency should be considered the overruling requirement with respect to other requirements (such as full-filling scientific scope and agreed service provision).

It is clear that the same added scientific value can be obtained by collaboration instead of integration, in particular because the ACTRIS concept differs from most other RIs identified in the ESFRI roadmap:

- ACTRIS RI addresses the atmospheric compartment of the Earth system, from ground-based systems,
- ACTRIS RI does not only target one specific component, but a whole series of short-lived species, hence, requiring the use of many different analytical techniques,
- ACTRIS RI does not exclusively address observations of the natural atmosphere but also synthetic mixing in simulation chambers,
- ACTRIS RI represents the European contribution and provides services to several international networks and programmes,
- ACTRIS RI is unique in placing physical (and remote) access to observing and exploratory platforms as key feature of its services, in support of excellent research and innovation.

While ACTRIS is unique and organized towards a fully independent RI, cooperation with other RIs in the ENVRI domain, and particularly the atmospheric domain, is a key to the users and stakeholders. The ACTRIS RI is fully integrated in the European Landscape of Atmospheric Research Infrastructures together with the IAGOS-AISBL, the ICOS ERIC Atmosphere and the EISCAT-3D project and cooperation with other RIs (which may be formalized) is part of its overall strategy. More specifically:

- ACTRIS RI complements the area of the ICOS ERIC Atmosphere (greenhouse gases) with the provision of information on short-lived pollutants including short-lived climate forcers.

- ACTRIS RI completes information provided by the IAGOS-AISBL both temporally by adding the required continuity of the time series and spatially by offering 3-D information across Europe on parameters measured by both RIs.
- ACTRIS RI investigates the atmosphere from surface to stratosphere and therefore complements the EISCAT-3D, mostly focusing on upper atmosphere dynamics, a region and a domain not covered in the ACTRIS RI.

In addition, other projects are currently funded under the European Commission Horizon 2020 Research Infrastructure Programme by the European Commission which are connected to the Atmospheric Domain of ENVRI:

- ARISE2: a design study aimed at monitoring atmospheric dynamics up to the stratosphere and coupling of modelling and observations.
- EUROCHAMP-2020: a clear convergence is established between ACTRIS and EUROCHAMP to merge activities into the ACTRIS RI.
- HEMERA: a newly funded project dealing with atmospheric sounding technologies. HEMERA is a starting community and connexions have not been established.

Outside the atmospheric domain, the ACTRIS RI has potential cooperation with other RIs in the ENVRI domain, such as the EPOS, for studying the evolution of a volcanic ash cloud after an eruption, or with the marine RIs such as the Euro-Argo ERIC and the EMSO ERIC, for the atmosphere-marine coupling for climate and environmental research. The ACTRIS RI is cooperating with all the ENVRI RIs within the ENVRIplus project to create a more coherent, interdisciplinary and interoperable cluster of Environmental Research Infrastructures across Europe.

Potential future co-operations are also possible with RIs from other domains for example: the CTA (Cherenkov Telescope Array), in the Physics domain, where the ACTRIS RI can provide relevant data for atmospheric transmissivity, or in the energy domain where the ACTRIS data and technologies are relevant for both energy supply and consumption (wind energy, solar energy etc.), or in the health and food domain where the ACTRIS data are relevant for impact on health and on the agriculture (i.e. ANAEE) and also within the social science where the ACTRIS data and technologies are relevant for the impact on cultural heritage (E-RIHS) and on life (ESS ERIC, SHARE- ERIC).

At present, apart from the general statements above, the ACTRIS RI can foresee the need for formal agreement with some RIs for dealing with the following issues:

At the national level

- Cost-efficient use of skilled personnel: Some employees might be shared whenever RIs do not require a full time position. This is already implemented in some countries whenever different RI are operating from the same location. Co-location allows a more efficient use of resources, as several RIs can use the same ancillary measurements (such as meteorological parameters) and some part of the same physical infrastructure.

- Joint physical access policy and incentive for collaborative projects, in particular for RIs belonging to other domains, to favour cross-disciplinary research.

It should be taken into account, however, that for the financial benefit there are also limitations. The same general physical infrastructure can be used by more than one RI only if it has free capacity available. If the infrastructure or manpower is already in 100 % use, more use by another RI cannot be added. Furthermore, as the RIs have different scientific scopes and thereby use many RI-specific instruments, the same staff does typically not have the expertise needed by both RIs. Since most facilities also already exist and are functioning there seems little financial benefits from building up co-locations.

At the European level

- Work towards Interoperability of data centres will be an important objective for the next 5 years. As different RIs have different scientific scopes their data are of different nature and are structured differently, even though increased data interoperability is sought for within projects such as the ENVRIplus. As a result of this, the use of the same data processing tools in more than one RI is rather limited, even within the same domain. This will require pooling of resources in different data centres either in a joint project (ENVRIplus follow-up, Next-GEOS/EURO-GEOS) or as a joint activity of a sub-ENVRI RI group, possibly in the atmospheric domain.
- Collaborative efforts may well be pursued under joint representation of atmospheric ERICs and other legal entities in research and development projects, funded at the European level. For example, the ACTRIS RI should, and does, collaborate with e-infrastructures. In this context the term e-infrastructure is not limited to ESFRI e-infrastructures, but also to other data banks and data depository services. E-infrastructures already have available data storage capacity and many of the tools and expertise that RIs need. The level and nature of the collaboration with an e-infrastructure depend on the data requirements of the RI, and it should be decided case-by-case what tools and services are to be developed within the ACTRIS RI, and what can be obtained from an external e-service provider.
- Synergies and integration can be sought also on management and activity level. Shared governance bodies with other RIs for running the operations would not seem feasible because of the complexity of the different RIs and the differences in the science objectives and, hence, requirements for knowledge management. Some advisory boards, such as for example ethical boards, however, might be common for several RIs if the scientific field is similar enough. The costs of these advisory boards are rather small compared to other expenses, though, so the financial benefits would be rather small, too.
- On an activity level, the ACTRIS RI could benefit from shared training and education courses with other RIs. This kind of cooperation is already done in the ENVRIplus project.

The organizational level integration becomes less feasible if the legal framework chosen is different between the research infrastructures under discussion. If one RI is a legal entity under national law and

the other RI is one under European law, the governance bodies may have different types of formation. However, the required external advisory bodies may have a very similar mandate and there are possibilities for collaboration (see above) since distributed environmental research infrastructures share commonalities in data management, ethical issues and services to users.

Deeper organizational integration, if considered feasible from the legal framework point of view, so that the highest decision making body is integrated and all activities and budgets are decided at the same meetings, would require changing the constitutional documents (e.g. statutes, financial rules), business model, renegotiating the membership fees, and reformulation of the joint vision and mission. In addition, currently all the research infrastructures in the atmospheric domain have different representation of the countries as a member. The different member representations of different RIs would be very difficult to take into account in the decision making process (e.g. in voting rights and rules).

3.2. Collaboration with other organisations

In addition to collaboration with other RIs, the ACTRIS RI shall collaborate and conclude mutual agreements with a number of organizations, either to facilitate the production of services, or to ensure that a specific service is provided or to ensure that the role of the ACTRIS RI is clearly established. As of today, we expect collaboration with the following organizations and programmes:

- WMO (World Meteorological Organisation): No legal binding envisaged but the ACTRIS RI may officially apply to become a contributing network to the GAW (Global Atmosphere Watch) programme under the WMO. A specific issue will be the situation of the WDC and WCC (World Data and World Calibration Centres) of the WMO which are included as ACTRIS Central Facilities. Currently, operations at the WDC and the WCC are partially funded under the EU ACTRIS-2 project and through targeted funding in Germany, in Switzerland and in Norway. It is recommended that a Memorandum of Understanding should be established between the ACTRIS legal entity and the WMO/GAW for ensuring continuity of services under the ACTRIS legal entity.
- ECMWF (European Centre for Medium range Weather Forecasting): the current contractual agreements will be formalized and reinforced under the ACTRIS RI for the provision of information from the ECMWF to the ACTRIS RI. Currently, provision of information from the ECMWF is organized either through the National Weather Services in different countries or cooperation agreements with specific research performing organisations. Under the ACTRIS legal entity, provision of ECMWF data and products should be granted for all the ACTRIS Central Facilities which require them. It is obvious that use of the ECMWF data and products by the ACTRIS RI will have stringent restrictions.
- COPERNICUS: A number of small-scale contracts are being established with the Copernicus programme to develop future services. It is expected that once the preparation phase is over (2020), the ACTRIS legal entity will pursue the existing collaborations and establish an

agreement for the provision of data for CAMS and C3S (Climate services), including provision in NRT of cloud, aerosol and trace gas data. It is important to clarify which will be the policy applied to data transferred for the Copernicus-related services.

- NWS (National Weather Services): it is expected that the NWS are regular users of the ACTRIS RI which may in the future allocate resources to develop services targeted for the NWS.
- EMEP (European Monitoring and Evaluations Programme): Relationship with the EMEP must be established most likely under the form of a Memorandum of Understanding between the ACTRIS legal entity and the EMEP steering body representatives. The ACTRIS RI and the EMEP operate jointly the EBAS, which is the Topical Centre for near-surface data on aerosol and trace-gases under NILU's (Norwegian Institute for Air Research) responsibility. The EBAS is also linked to the WMO GAW program. How the joint coordination under the MoU will be established is not settled yet. Relationship with the EMEP may also concern use of ACTRIS Topical Centres. While some the EMEP station (Level 2 and 3) will fall into the National Facility category, others will not and may ask for using calibration services offered by the ACTRIS RI. If this will be handled at the National Level (by National EMEP committees), at the EMEP level, or both is still an open question.
- ESA (European Space Agency) has established contracts with several ACTRIS partners but the nature of the possible ESA contract with the ACTRIS legal entity remains to be clarified. Issues that can jointly be under the ACTRIS-ESA contract may regard the use of ESA computing resources by the ACTRIS RI, and vice-versa, the use of ACTRIS products by the ESA. Again, level at which subsidiarity applies between centralized ACTRIS activities and activities by one of its members remains to be clarified
- EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites): idem as for ESA
- EEA (European Environment Agency): no formal agreement is expected to bind the ACTRIS legal entity to the EEA, but ACTRIS experts can be called to participate, as representatives of the ACTRIS RI
- European Commission: under a legal entity status the ACTRIS RI will be able to participate as unique and sole beneficiary in any projects funded by the European Commission.
- Private partnership: It is not so clear at this stage how private partners will be using the ACTRIS RI. What kind of agreements and on which level they are negotiated depend on what kind of internal structure from the different options described in chapter 2 is chosen for the ACTRIS RI. In principle if the ACTRIS Central Facilities are used the service agreements should be dealt with by the ACTRIS legal entity. A key issue will be the amount of time the Central Facilities are operating for the ACTRIS RI. For use of National Facilities, no direct link with the ACTRIS legal entity is expected.

Through collaboration with other RIs, with international organisations and programmes, the ACTRIS RI can address scientific and societal challenges through synergies and complementarities. For this good coordination by the ACTRIS legal entity is needed.

4. Conclusions and recommendations to the Interim ACTRIS Council

Organizational integration is not seen as an option as the RIs' objectives, legal models, country memberships and representations, level of maturity, and structures varies too much to gain any administrative or financial benefits. Instead valuable and far reaching collaboration can be achieved by optimizing the interoperability of the data systems among the other environmental RIs. This work is in progress in the ENVRI cluster under the ENVRIplus project. Another possibility of linking activities is the co-location of the sites when it is appropriate.

Adopting a legal entity for the ACTRIS RI is a vital step towards firmly establishing the ACTRIS RI as a key atmospheric RI aligned with the ICOS ERIC, the IAGOS-AISBL and other RIs in the environmental domain.

The ACTRIS preparatory phase project is proposing the Interim ACTRIS Council to select the ERIC as the legal entity model for the ACTRIS RI as the ERIC has been particularly established for Pan-European research infrastructure needs. Moreover, the ERIC has already been many times successfully implemented and all the European member countries are familiar with this concept.

If the countries are not ready to establish an ERIC, another kind of international organisation is not foreseen as an option. The second choice for the ACTRIS RI to establish a legal entity would be an organisation under some national legislation like, for example, a non-profit limited liability company in Finland. This option, however, is not regarded as very practical considering the complexity and size of the ACTRIS RI.

The ACTRIS preparatory phase project also encourages member countries together with their research performing organisations to work towards an ACTRIS structure where a maximum number of Central Facility level operations are included in the ACTRIS legal entity (option 1 in chapter 2.3.1.) to ensure the coherent coordination and management required for common operations under a common decision making structure.