Governance

Windscanner.PT

National Research Infrastructure (PINFRA/22207/2016)

WindScannerPT

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November 2021

Summary

This document presents the governance structure foreseen for the operationalization of the WindScanner.PT research infrastructure. The methodology for the implementation of the governance structure, followed the one developed for the European Infrastructure WindScanner.EU, which was the origin of this Portuguese RI. However, as the European RI did not move forward due to a series of situations related to the infrastructure financing rules of the various members of the European consortium. In this sense the Portuguese consortium decided to maintain the project and adapt the RI structure to the Portuguese context and follow a simple model based on the usual research projects, and based on the governance structure defined for WindScanner.EU.

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1. The Infrastructure Model

1.1. Legal structure

The WindScanner.PT was intended to follow the European WindScanner Infrastructure [1] which corresponded to the ERIC model. However, as the European IR did not move forward due to a series of situations related to the infrastructure financing rules of the various members of the European consortium, the Portuguese consortium decided to go ahead with the planning of the implementation of the Portuguese infrastructure. In this sense, the governance structure of the windScanner.PT research infrastructure, follows a simple model based on the usual research projects, and based on the governance structure previously defined for the European research infrastructure, WindScanner.EU.

1.2. Governance Structure

The governance model for the WindScanner.PT research infrastructure is based on the developed for the European Infrastructure WindScanner.EU, since it was meant to be a national node for this RI. Nevertheless, and although the European Infrastructure was not fully implemented, since the nature of the services to provide, the equipment and the target users followed the same idea, the main guidelines for the governance structure were maintained.

The selected governance model, follows, in a general way, the ERIC legal model, and the basic elements needed to guarantee the pursuit of research activities in the area of wind, provision of services to the industrial sector and support to public entities, such as airport services, municipalities or others that need a detailed characterization of the 3D behavior of the wind.

In this sense, and following the usual governance models established for the European Commission funded research projects, the governance structure includes two mandatory bodies, a members' assembly and a board of directors.

The infrastructure is composed of members from different Portuguese R&D and private entities, and the highest decision-making body is the General Assembly that will vote and approve the proposals presented for the several management areas and projects/services to be provided in the scope of the Windscanner.pt RI. The General Assembly will be assisted by an International Advisory Board in order to make the services and R&D projects more suitable and applicable to the present needs of the R&D and industry sectors.

Finally, a secretariat will be created to assist the Board of Directors in the day-to-day business of the RI.

Further working groups and committees can be established during the operation of the RI as they are needed for specific subjects.

In the next paragraphs the roles of each body are described.

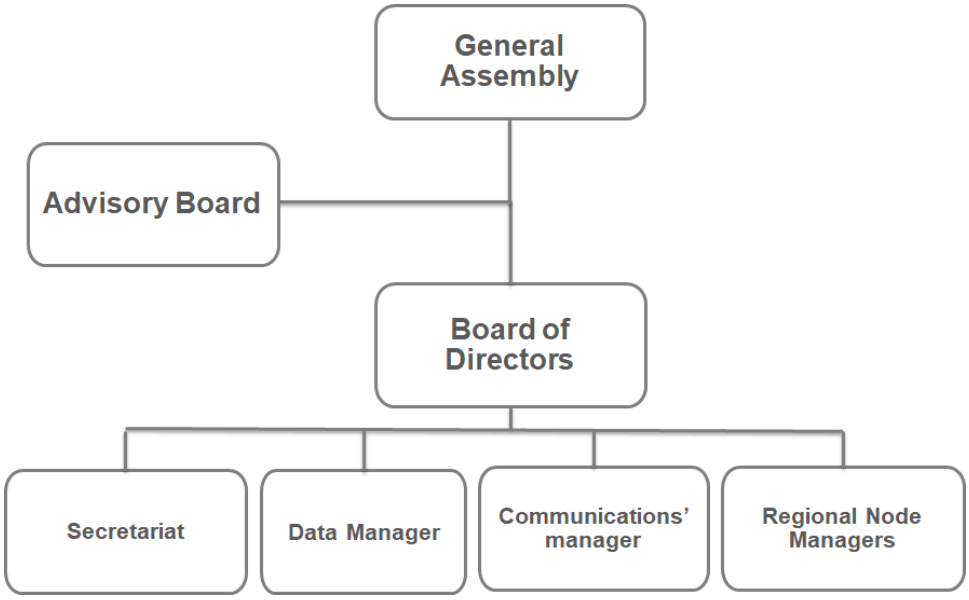

Figure 1. Management Structure.

All WindScanner.pt infrastructure operations are run and financed by the consortium and by the incomes from projects and services to the target users.

The Infrastructure consortium includes at least three Portuguese regions at the time of this report, where the operations will be co-managed – North, Centre (Metropolitan Lisbon Area) and Madeira Island. In this sense, a Regional Node Managers Forum will be created, consisting of the heads of each Regional Node and a support team selected by each of the regional managers. Each regional manager can create further working groups and committees according to the activities that will be developed. All the working groups and Committees need to be approved by the General Assembly.

In addition, a Responsible for the communication and dissemination of the RI activities will be appointed by the Board of Directors and subject to approval by the General Assembly.

1.2.1. General Assembly

The General Assembly is the principle decision-making body for overall strategy and policy for the WindScanner.pt. This management body is composed of representatives of the WindScanner.pt partner entities and has as main responsibilities, to:

- Elect a chairperson from the representatives of the Partner Entities for a period of two years.
- Meet at least once a year.
- Make all strategic decisions including appointing the members of the Advisory Board and the Board of Directors.

- Receive and approve the annual report, the financial statement and the annual spending plan submitted by the Board of Directors.
- Review, at least annually, the actual and forecasted survey and operating costs.
- Receive and approve the annual activity plan from the Board of Directors, which contains the broad scientific aims of WindScanner.pt.
- Review performed tasks and activities.
- Appoint a responsible for the data management of the RI and the project managers for the services and co-funded projects.
- Define the levels of access for the open-access database and fees.

1.2.2. Board of directors

The Board of Directors is headed by WindScanner.eu Executive Director and will provide support to the General Assembly. As a core role, the Board will support and coordinate the activities of the infrastructure as well as managing resources.

The Board of Directors and the Executive Director will be appointed by the General Assembly. Due to the dimension of the RI the Executive Director will work part time based on secondment from their home institution and will pass to full time when the volume of work in the RI increases in a way that justifies that change.

1.2.3. Advisory Board

The General Assembly and the Board of Directors will be advised by an independent Advisory Board, which oversees the quality of WindScanner.pt activities.

The Advisory Board will be composed by two external advisors that will assist the Board of Directors and will act as consultant Body of the RI.

The Advisory Board will report and give advice on issues like the overall quality assurance, strategic planning, evaluations and reviews. It is not a decision-making body. The Advisory Board will, when relevant, and at least once a year, be summoned to meet with the Board of Directors.

1.2.4. Secretariat

The Secretariat will assist the Board of Directors in implementing the decisions made by the General Assembly, including planning measurement campaigns, hosting and updating the WindScanner.pt website, and organizing training and education for the members of WindScanner.pt and external users.

The staff will be employed by WindScanner.pt in Hub.

The staff will consist of IT and LiDAR specialists that can assist both the Regional Nodes and the RI with a wide range of tasks. There will, furthermore, be IT specialists to develop, establish and operate the WindScanner User Platform.

It is furthermore foreseen that employment based on part time secondment of staff from the universities and research institutions of the Regional Nodes can be used to ensure well-balanced costs and a flexible secretariat. Salary and working terms will be handled by the institution and shall be in accordance with the HR policy of WindScanner.pt.

1.2.5. Data and Communication managers

Due to the complexity of the foreseen experiments to take place, and the consequent amounts of data to be generated, a Data Manager and Communication Manager will be appointed. The BoD will propose a Data Manager and a Communications Manager to the GA, and the GA will approve the DM and CM with a “Majority of votes” scheme. They will be in charge of managing and storing the data in the users platform created for this end (Data Manager), and be responsible for the organization of the dissemination and communication actions.

In this sense their main roles are:

- Data Manager: To manage the data generated by the experiments – Formats, quality check and similar. Define the levels of access and design the rules related with the data use and publishing with the help of the IT team at the National Hub
- Communications Manager: Responsible for the dissemination implementation actions; contact lists and communications to the press. Close cooperation with the IT Team and Project Managers.

1.3. WindScanner Central Hub (WCH)

WindScanner.pt will establish a centralized hub to enable and strengthen stakeholders’ ability to perform innovative research and create impact in society. This WindScanner Central Hub will be managed by the Board of Directors and operated by the Secretariat.

The WindScanner Central Hub will coordinate the planning of national and European measurement campaigns to ensure efficient use of the WindScanner equipment and assist to exploit the scientific value of the proposed campaigns. Each measurement campaign will be financed through the Regional Nodes by specific funding sources, each applying their own rules for evaluation of proposals, open access etc. Moreover, the WindScanner Central Hub will, as a rule, not perform commercial activities, as this will be done by the Regional Nodes.

However, the WCH can assist the National Nodes when there are joint calls for commercial tenders and similar services that require the use of the equipment. Thus, any responsibility or liability issues related to commercial activities are placed at the nodes. The ownership of the equipment belongs to the regional nodes that financed it. The hub will, on the other hand, provide assistance to the regional nodes on the scheduling of use and time use allocation to each user, as well as the sharing rules to follow for the projects.

The services provided by the WindScanner Central Hub are as follows:

- Training: Education and training of technicians and researchers in operating the WindScanner Systems owned by each node; inform on scheduling and use of the equipment whenever needed and available services on the nodes..
- Data management: Develop a Data Management plan that handles the actions related with the data flow on the nodes, data storage solutions, hosting of servers if needed, data dissemination (user platform), hosting the website for WindScanner.pt and analysis and processing of data.
- Administrative tasks: Manage an administrative office covering issues like standardization, organizing and defining the needs/requirements of further prototype WindScanners; organize exchange of researchers among the nodes; organize training, summer schools and exchange courses and even modules for master students and Ph.D's etc.; assist scientifically, technically and administratively when a National Node has issues related to WindScanner Systems.

1.4. WindScanner Regional Nodes

The Regional Nodes' main role is to ensure the continuous use of the WindScanner technology, as well as providing access to the user community, enhancing a set of joint research actions and activities for this technology. All the commercial activities will be conducted by the regional nodes, using their budgeting and planning usual procedures as long as they follow the general rules for the infrastructure to ensure the quality of the work and results. The Regional Nodes will also define their specific operational areas (technical, commercial, financial, etc.) and include them in the annual plans of activities. Nevertheless, in case specific activities arise, the WindScanner Central Hub might request specialized personnel in certain areas to have the same type of response among all Regional Nodes (i.e. data treatment, databases). The Regional Nodes are responsible for conducting the experiments in their region and act as a contact point for researchers and Industry to provide the necessary services in the area of this RI.

The WindScanner.pt research infrastructure will be constituted by 3 regional Nodes - North, based at Porto, Madeira Island and Lisbon region, at this date, but new members can step in at any time after approval from the General Assembly. The regional nodes are also in charge of:

- Develop an annual activitíes plan specifying the services and activities that will take place in the scope of the RI and submitted for approval of the GA.
- Define and submit to the GA for approval of the different plans (Scientific and Academic program, Funding program) and:
    - Acquisition of Technical Equipment (or related costs):
    - Site selection and campaigns planning
- Staff and training: Define the necessary staff to support all the activities proposed and the stakeholder's demands (decide between hiring or use of own personnel).

1.4.1. Services provided and collaboration with the WindScanner "Central Hub"

In this RI, there are expected to exist three regional nodes, with the possibility to expand to more nodes. Each Regional Node will develop their activities plan every year where the windscanner technology is to be used, having as principle the continuous application of this technology. The Regional nodes plans will contain the specifications of the services and activities provided referring to the connections with the central hub and other nodes whenever applicable.

The Activities' plans must be approved by the General Assembly.

At this time, the serviced foreseen and to be provided by the regional nodes in collaboration with the central hub are:

Funding program: The regional node is responsible for the funding sources supporting the activities targeted by the stakeholders, whether in research programs or Tenders. In all cases, a detailed plan for each funding opportunity shall be elaborated.

Scientific program: Each Node will have to create a research plan collecting the current plans and the regional members' proposals.

Academic program: Identify and promote the exchange of scientists and engineers among the Regional Nodes. There can be the need to have additional technical assistance in complex experiments, and in this case the rules to follow will be set by the Central Hub and approved by the general Assembly. The same happens with the rules for the use of the databases generated by the experiments suitable for academic purposes. Moreover, PhD and MsC thesis will be proposed to work with the data generated or to participate in the existing projects at the same time.

Technical Equipment: Equipment is to be bought by each Regional Node or shared among windscanner.pt partners. The Procedures for buying equipment are executed by the regional Node. For each experiment or activity demanded by a stakeholder, the regional Node will define the necessary staff to support it and about either dedicating some personnel from their organization, from other associated members or simply hiring new personnel to work exclusively with WindScanner activities.

National Nodes will train its staff in general wind matters as they wish. However, all staff operating or analyzing data of WindScanners will receive the specific training developed by the WindScanner Central Hub, or equipment provider, and will be formally qualified.

Sites selection and Measuring Campaigns: Regional Nodes provide sites, people and equipment to run ad-hoc campaigns as defined and coordinated jointly with the WCH. It is also its responsibility to set up the measuring campaign, starting with the necessary operational specifications and site assessment. These actions will be validated by the WCH to ensure the quality of the experiments and the standardization of operational procedures. The National Nodes can also provide this service to projects in which the National Node is actively participating, or as a service for a third-party project. But in all cases, the results obtained will comply with the regulations from WCH and data treatment.

1.4.2. Involvement of stakeholders and users

The involvement of stakeholders in the RI is of utmost important due to the dissemination level that needs to be achieved to develop the activities, due to the importance that the views and needs of the different end end users bring to the development of the activities, and also to make the necessary adaptations to the research and application services in order to have a more effective value to the users/clients.

In this sense, the platform developed for this RI is one of the means foreseen by the consortium for this end, together with all the actions planned in the communication strategy.

Being the founder member part of the stakeholders that will be using this infrastructure, the main functions of these stakeholders will be:

- Organizing meetings between partners of the project, for discussion of activities to develop and already developed inside the project.
- Gathering information from different areas related to the project that may aid its development.
- Providing resources and knowledge for the projects activities that may require.
- Spreading information and promoting the project's services.
- Promote meetings with sectoral stakeholders and disseminate the RI activities, while at the same time, collect information on areas that need specific R&D and where the RI can contribute.

1.5. Membership and membership levels

In the WindScanner.pt the members are all Portuguese entities and the RI is not connected to any other European Infrastructure. In this sense, the members that found the Infrastructures – Founder Members – will all have the same membership level. The acceptance of new members will be subject to the approval of the General Assembly, being always necessary that the candidates to membership present the added value of their participation.

In terms of rights and obligations, all the members will be equal. The General Assembly can, at any moment, implement other types of membership, such as observers or associated members. The admission of new members is encouraged, being the approval subject to, at least, two thirds of the General Assembly’s approval.

1.5.1. Membership fees

Not applicable for founder members. For the new members a symbolic fee may be applied and will be defined at the first trimester of the operational phase of the RI.

1.6. IPR management

The Intelectual property rights (IPR) follow the general rules for the European Funded Projects. In this sense the IPR results created by the research entities (Universities, research centres and similar) that are part of the RI, belong to the ones that generated the results. On the other hand, the IP of results created by the WindScanner.pt shall belong to the consortium that founded the Infrastructure. Background information will be identified at the beginning of the operation phase and will be managed by the Board of Directors. Being a Portuguese Infrastructure without connection to any other European country research infrastructure, the questions related with Intellectual Property Rights, between the regional nodes will be governed by the Portuguese legislation on this subject. At the beginning of the operational phase, all the documentation related with this subject will be prepared and be part of the legal statutes of the windscanner.pt infrastructure.

2. Data Management and the WindScanner User Platform

2.1. Data Management

The operation of the WindScanner equipment has a similar behavior to LiDAR based sensors and generate substantial amount of data. For this reason, it is necessary to have a robust e-infrastructure able to support a strong data work-flow process: scanning, data acquisition, collection, processing and visualization, data mining and long-term preservation. This will enable to handle cutting-edge research and facilitate impact in society by enabling access to and re-use of the research data generated, extensive data consolidation requiring an effective and solid structure.

The data management in WindScanner.PT are assessed following the requirements of the EC council regulation on the Community legal framework. In the same way, the facility shall contribute to the mobility of knowledge within the ERA as well as the dissemination and optimization of the results of activities in Community research, technological development and demonstration.

In this research infrastructure, a platform including a database for data storage is created and available to the target communities, enabling access to the data obtained in the experiments and related documents. The platform also includes an e-science component to make available to the scientific community and industry, research documents – papers, technical notes, thesis and other related documents. This platform will be hosted by the WindScanner Central Hub, which will provide the possibility to protect and distribute data according to different confidentiality, and access, levels.

In the scope of this RI, a platform to manage the data and the experiments is under development and will enable to secure, store and structure the data - WindsPT. The specifications of the equipment installed in each experiment and related documentation are available and a dedicated channel to store the data, interlinked to the documentation of each experimental campaign is avaliable. With this platform the database available at WindScanner.pt assures that the data is made available to users. The Data Manager will at the operation phase define the suitable levels of access according to the target groups.

WindsPT [2] supports the work of Campaign managers and participant institutions from planning and preparation to execution and dissemination of the results.

The objective of this Web application is to be a support tool for the design and management of field campaigns, and an archive of all the relevant information linked to them. Campaign participants find in WindsPT the location of the stations and equipment used to collect experimental data, the list of relevant events, and the documentation produced.

WindsPT includes the following functionalities:

- Collaboration intention surveys: to collect partners' intention of collaboration while building a categorization structure and involved equipment information.

- General purpose experiment information: general information that will be useful for all experiment participants, such as: location, contact, dates, topography and roughness maps.
- Collaboration intentions' summaries by experiment: one page summary of all resources for one experiment: equipment, wind flow models and personnel.
- Field stations installation and equipment: a functionality, allowing the Campaign Manager to create stations and equip the tower stations with the equipment required.1)
- Equipment inventory: the data base of all the equipment by: category and manufacturer, with datasheets and manuals.
- Logbook: record of campaign events of different categories and diverse visibilities: Issue, Schedule, Installation, Social, and more.
- Document manager: management of a campaign “Dropbox” with folders and files related with the campaign.
- Timelines: management of campaign staff and equipment.
- Administrative management functionalities: management of the whole platform: user accounts, equipment, logbook events, documents, wind flow models data curation.

2.2. WindScanner Platform

The WindScanner Platform represents one-point-of-entry for users where they can acquire necessary knowledge about the technology and have the possibility to download data series for their studies – validate models, perform wind energy potential estimates, wind behavior characterization, and other applications that require a detailed knowledge of the wind behavior.

It will also enable them to communicate and collaborate with peers and contribute to ongoing projects or start new ones, whether on co-funding programs (Horizon 2020, other) or use their own funds. In this sense, the accessibility and facilitation of the technology will be met with this platform. The consortium members in the implementation phase are responsible for its development and implementation.

2.2.1. Open Access

According to the European Commission, open access is “the practice of providing on-line access to scientific information that is free of charge to the end-user”. In this sense, the WindScanner User Platform, will be aligned with the policies on open access as set out by the European Commission, to facilitate the best possible dissemination of results generated by the RI. Therefore, it is intended to give access to the research data, free of charge, to the users, being this granted according to the levels of confidentiality associated to the different data sets defined by the contractual terms defined for each generating data funding – funding agencies, services provision, and other.

3. Impact

Emerging technologies can represent considerable impacts across a number of fronts. As technologies evolve so does the life quality of a population, although some improvements in technology may also involve negative impacts in other areas or sectors. With this in mind, one can list several positive and negative impacts across different key areas of this project.

3.1. Scientific Impact

A lot of effort has been done over the past years in research around renewable energies. Driven by the climate crisis, leaders all around the world have generally increased their concerns on reducing their impacts on weather and environment [3]. This new trend has brought an increasing investment in the green sources of energy, therefore it has also brought impact to their development and, consequently, to all types of research around the subject.

WindScanner.pt is aiming to create a largely distributed research infrastructure, in which participants will be able to exchange knowledge and information evolving wind energy and meteorology. This research network will bring many positive impacts to the scientific communities, by introducing a new technology still under development and with much room to grow.

3.2. Societal Impact

Social impacts and social risks are both endemic to infrastructure. Social impacts represent collateral benefits to communities that extend from the investment. However, these often come at a cost resulting in trade-offs that one must address during the investment process. Thus, impacts and risks co-exist in an integrated way in large-scale infrastructure projects and are often challenging to disentangle when making investment decisions.

From a practice perspective, there is a material gap in professional and scholarly writings focused on the discrete social impacts of research infrastructures. What types of social consequences and social risks arising from investments in infrastructure projects? How are these identified, monitored, and their effects measured? What practices do institutional investors employ to effectively integrate social impacts and social risks throughout their investment processes? Finally, what procedures do they use to ensure their effective integration into the operational phase of their projects?

The distributed characteristic of WindScanner.pt Infrastructure will result in a small but positive social impact due to synergies from the partners from the design onset.

The infrastructure management will continuously integrate the Social impacts, and risks will be across the investment process. The administration will connect investment objectives at the pre-investment phase with outcomes at the asset management phase using measurable and reportable metrics. Discrete key performance indicators (KPI's) will permit analysis of a greater degree of asset- and sector-specific detail, thus measuring the evolution of the social impact.

3.3. Economic Impact

It is known that wind is a well grown but still promising source of energy. But, due to the dimension involved, wind energy also represents a big investment and risk for wind park managers. In order to have a secure investment, there is the need to determine the level of potential that each site represents for energy generation. Development has been made over the years regarding this concern, but the methods of experimental assessment of the wind are still not very capable of providing quality information to users, partly due to their spatial limitations. WindScanner.pt introduces an all-new method on experimental measuring of the wind resource, offering an improvement to the limitations previously stated. The use and development of this technology will allow investors to have more information on the wind profiles over their target sites, therefore have more assurances about their potential for electricity generation during the lifetime of the project. In short, WindScanner.pt will aid the decision making of the investors and avoid bad investments on projects, this will have significant impacts due to the economic dimension dealt with in this sector.

3.4. Measures to maximize impact

3.4.1. Communication and dissemination

The communication strategy is based on the interactions with the stakeholders that will benefit from the RI activities and made through the actions to be taken by the partners on the dissemination level and through:

- The creation of a discussion Forum in the first semester of the RI operation.
- The organization of meetings with the stakeholders.
- The organization of periodical meetings between the regional nodes and its managers.
- The advertisement of the activities in social media, partners web sites and other channels usually defined for this purpose.

Also, the identity of the RI will be created - official web page, documentation templates, leaflets and brochures that enable the potential client to understand the type of activities that will be conducted by the RI.

The RI will also organise workshops and webinars, participation in demonstration events and R&D conferences.

3.4.2. Education and training

Being among the partners involved in this RI academic institutions and Research laboratories, efforts to involve young researchers in the activities is one of the objectives of the consortium. The participation through MsC and PhD thesis to train young researchers on the target topics related to the foreseen activities will increase the dissemination and outreach of this infrastructure.

Also Training actions for technicians already involved in the wind sector in order to give them skills to operate the equipment will increase the reach of this IR, as well as the number of users and beneficiaries of the activities and results to be obtained, thus allowing for a greater development of this technology.

In summary, the consortium will conduct the following actions:

- Training actions involving young researchers - summer courses and Msc and PhD thesis.
- Training of technicians.

4. Final Notes

This document presents the governance structure for the operationalization of the Portuguese Research Infrastructure WindScanner.PT.

The structure follows a simple model based on usual research projects and the main highlights referred on the WindScanner.EU RI.

During the first phase of operation of the RI, this governance structure will be updated according to the final configuration of the RI and members that will integrate it on that phase.

Nevertheless, the work here presented already covers the most relevant aspects needed for its operation and assure its well functioning.

5. References

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