

Deliverable report

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Leaflet on tools and services available and offered by RIs to SMEs

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TABLE OF CONTENTS

1.	Overview.....	3
2.	Links and References.....	7
3.	Dissemination Channels	8
4.	The Leaflet.....	8

1. Overview

Research Infrastructures (RIs), as highlighted in the European Strategy Forum on Research Infrastructures (ESFRI) White Paper, have the potential to contribute to local and regional socio-economic development supporting regional research priorities and the implementation of the Smart Specialization Strategies (S3).

Smart specialisation is an innovative policy concept which emphasizes the principle of prioritisation in a vertical logic (to favour some technologies, fields, population of firms) and defines a method to identify such desirable areas for innovation policy intervention. Its rationale involves both the fact that, even in the information age, the logic of specialisation is intact, particularly for small entities such as regional economies in Europe and the argument that the task of identification (of what should be prioritised) is very difficult and therefore needs a sophisticated policy design. With this policy brief, it is our aim to set out a coherent vision of the goals of the policy approach that is evoked by the term smart specialisation.

The core activity of Task 4.3 is to design, develop and promote a thematic booklet. The focus in this activity will be put on the links between research infrastructures and smart specialization strategies and the potential of RIs to benefit the regional and national S3 goals. The booklet will include a collection of success stories of utilized links and synergetic partnerships from member states represented by project partners.

In preparation for the deliverable, the task leader (Ministry of Education and Science of Bulgaria) drafted an overview of various types of research infrastructures and organisations as a basis for further description and showcasing of the portfolio of services provided from RIs to business and industrial organization, within the context of Smart Specialization Strategies implemented across Member States.

Information and references on the subject are provided as means for elaboration on the examples presented in the document

Profile of the RI/R&D organisation	Explanations	Examples and references
Research infrastructure	Research infrastructures (RIs) are facilities that provide resources and services for the research communities to conduct scientific research and foster innovation in their fields. RIs usually have and utilize major equipment or sets of instruments, knowledge-related facilities such as collections, archives and scientific data libraries/repositories.	The National Center for High Performance and Distributed Computing (http://nchdc.acad.bg/en/) (Bulgaria) is an electronic computing infrastructure that provides stable and reliable computing services for solving large tasks in a sustainable way, in the long term, with maximum flexibility, training and support to users from various scientific fields. NCVRP has a highly qualified team and manages and operates various resources: high-performance resources - supercomputer and clusters with different hardware architectures, grid sites, clouds with the possibility of running virtual machines for services and distributed computing, data storage resources with the possibility of short-term and long term storage.
Center of Competence	Are usually collaborative entities established to facilitate synergy on regional or national level between scientific research organizations and industry/business. Centers of Competence, by default, are resourced by highly-qualified and experienced researchers associated with research institutions who are tasked to carry out focused strategic research for the benefit of society and national economy.	Center of Competence "Clean technologies for a sustainable environment - water, waste, energy for a circular economy" (CLEAN&CIRCLE; https://www.clean-circle.eu/en/) (Bulgaria). The "Clean&Circle" Center of Competence aims to invest in scientific infrastructure, professional capacity, innovative, technological and business models that create conditions for the functioning of an ecosystem in the field of clean technologies and the circular economy with a focus on water, energy and waste management. The strategic goal is the CC to become a national and European innovative research, applied development and educational center in the field of leading technologies and biotechnologies for the circular economy. This center will create and test algorithms for the ecosystem of experienced experts and young innovators.

<p>Center of Excellence</p>	<p>Is usually a national consortium of research organizations and universities set up with the purpose to unite existing resources, infrastructure and expertise and become a highly competitive and internationally recognized research complex</p>	<p>National Center for Mechatronics and Clean Technologies at the Technical University of Sofia (Bulgaria). The Center for Excellence in Mechatronics and Clean Technologies is the largest in terms of capacity and concentration of scientific potential of such a center in the country. It involves 17 research institutions that are equal partners and are the best in particular thematic areas. It includes 3 scientific campuses: Campus "Student City", which is located in the completely renovated block 8 of TU Sofia, specializing in mechatronics; Lozenets campus, located on the territory of Sofia University "St. Kliment Ohridski", focused mainly on research in the field of clean technologies; and Geo Milev Campus - on the territory of BAS, covering the fields of mechatronics and clean technologies.</p>
<p>Research Institute (usually affiliated to the respective national Academy of Sciences)</p>	<p>A research institute or research organization is an establishment founded for doing scientific research. Research institutes may specialize in basic research (expanding the boundaries of scientific knowledge) or may be oriented towards applied research (scientific, technological and innovative compounds and technologies that could be transformed into products and services for the benefit of society (incl. business and industry). Research institutes affiliated to the respective national Academy of Sciences are predominantly financed by public funds.</p>	<p>Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (https://www.iict.bas.bg/en/subject.html) Contemporary calculations: development of efficient means for analyzing the reliability of large-scale computer models, high-performance algorithms for parallel processing and supercomputer applications; creating customized biomedical applications; reliable and effective pollution control / environmental recovery models, etc. “Big” data: processing large volumes, type and variety of data coming from a variety of input devices (3D computer tomography, thermal camera, high-speed camera, etc.); development of new methods, tools and applications using “big” data in such problematic areas as preservation and conservation of cultural heritage, development of new nanomaterials, etc. Intelligent interfaces: solving tasks with big computational complexity related to real-life objects or the Internet that will allow for the development of advanced tools for processing text repositories, semantic networks, analysis and synthesis of speech; creating new, effective methods and algorithms for multifunctional interfaces based on eye movement tracing, gesture recognition, mimic, body language, etc., as well as new methods and algorithms for processing information from hyperspectral cameras, acoustic grids, inertial sensors and other devices.</p>

<p>Dedicated National Scientific Research Program</p>	<p>Much like the Centers of Competence and Excellence, a dedicated National Research Program is carried out by a consortium of organizations. The program consolidates knowledge, equipment and human resources to push the development of a particular scientific, technological and/or industrial field (for example - cleantech, ICT and AI, smart livestock and husbandry, etc.). National Research Programs are financed by public funds and usually have a span of up to three years.</p>	<p>The National Science Program "Intelligent Animal Husbandry" (Bulgaria) is carried out by a consortium of 8 partners (universities and research institutes). The program is meant to boost the development in the relevant domain by providing recommendations, expertise, research results and innovative solutions that can be turned into products and services, such as:</p> <ul style="list-style-type: none"> Reduction of the human factor in animal husbandry; Genetic improvement of herds; Balanced feeding of animals with the aim of reduced emissions (of ammonia and methane) and high quality of meat and milk; Intelligent waste management; Animal health and welfare monitoring; Robotization and automation of technological operations in animal husbandry; Open science and providing open public access to scientific results; Digitization of science and animal husbandry; Digitization of education and creation of new educational resources in the field of animal husbandry based on the results of scientific research; Sustainable management of pastures and meadows. (https://smartlivestock.eu)
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2. Links and References

[Innovation-oriented cooperation of Research Infrastructures](#)

This ESFRI Scripta volume describes the different forms of industry and Research Infrastructure collaboration that generate innovation: industry as supplier for the construction / upgrade of the RIs, being instructed and guided in developing new technologies or production protocols; industry as partner of RIs and industry as user exploiting the specific dedicated access modes as well as through the academic access supported by research grants.

[MERIL \(Mapping of the European Research Infrastructure Landscape\) portal](#)

The MERIL (Mapping of the European Research Infrastructure Landscape) portal provides access to a database that stores information about openly accessible research infrastructures (RIs) in Europe, across all scientific domains, including the social sciences and humanities.

The MERIL database is a dynamic resource that is being continuously populated. MERIL data consists of lists of identified, eligible RIs, and a set of data for each individual RI, collected and displayed in a standardised format. The MERIL public portal is an open access resource displaying available information that has been collected with input from European Member States and Associated Countries, and the RI scientific community. The information is quality-checked by the MERIL Team.

[SME guide for access to research infrastructures](#)

This guide is aimed at small and medium-sized companies, SMEs with an interest in collaboration with research infrastructures in the Stockholm region. Other stakeholders in Stockholm's innovation system who have close contact with SMEs and research infrastructures can also benefit from the material.

How Efficiently Does the EU Support Research and Innovation in SMEs ([Science Direct](#))

The [European Regional Development Fund](#) devoted around 66 billion Euros to the financial support of innovation and productivity in European enterprises over the 2014–2020 programming period. In this framework, the research team assessed the implementation of the Operational Programmes dedicated to fostering research and innovation, particularly in small and medium-sized enterprises. With this aim, the research team used a network slack-based [data envelopment analysis](#) model paired with cluster analysis that encompasses a multitude of performance framework indicators to assess 53 Operational Programmes from 19 countries.

3. Dissemination Channels

The leaflet will be disseminated among the RICH Europe stakeholder mailing list (targeting the Industry category) and the RIs NCPs mailing list for further dissemination. Moreover all the RICH Europe dissemination channels will be activated, such as RICH Europe Website, Twitter, LinkedIn and RICH News.

This will raise awareness about the need of RIs to promote their instruments & tools to SMEs in their region or country and in turn raise the awareness of SMEs about the opportunities to utilize the tools and services provided by RIs.

4. The Leaflet



TOOLS AND SERVICES AVAILABLE AND OFFERED BY RESEARCH INFRASTRUCTURES TO SMES

RESEARCH INFRASTRUCTURES (RIS), AS HIGHLIGHTED IN THE EUROPEAN STRATEGY FORUM ON RESEARCH INFRASTRUCTURES (ESFRI) WHITE PAPER, HAVE THE POTENTIAL TO CONTRIBUTE TO LOCAL AND REGIONAL SOCIO-ECONOMIC DEVELOPMENT SUPPORTING REGIONAL RESEARCH PRIORITIES AND THE IMPLEMENTATION OF THE SMART SPECIALIZATION STRATEGIES (S3).

Example

Research infrastructures (RIs) are facilities that provide resources and services for the research communities to conduct scientific research and foster innovation in their fields. RIs usually have and utilise major equipment or sets of instruments, knowledge-related facilities such as collections, archives and scientific data libraries/repositories.

Centers of Competence are usually collaborative entities established to facilitate synergy on regional or national level between scientific research organisations and industry/business. Centers of Competence, by default, are resourced by highly-qualified and experienced researchers associated with research institutions who are tasked to carry out focused strategic research for the benefit of society and national economy.

Example

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A **Center of Excellence** is usually a national consortium of research organisations and universities set up with the purpose to unite existing resources, infrastructure and expertise and become a highly competitive and internationally recognized research complex.

A **Research Institute** (usually affiliated to the respective National Academy of Sciences) or research organization is an establishment founded for doing scientific research. Research institutes may specialise in basic research (expanding the boundaries of scientific knowledge) or may be oriented towards applied research (scientific, technological and innovative compounds and technologies that could be transformed into products and services for the benefit of society, business and industry. Research institutes affiliated to the respective National Academy of Sciences are predominantly financed by public funds

Example

Please keep in mind that **the competent Ministry in your country should have publicly shared information and links on its website** to the National Roadmap for Research Infrastructures, to relevant partner organisations, to thematic websites and portals, as well as to dedicated tools and service lists that facilitate the partnership between education, science and business/industry.

LINKS AND REFERENCES

INNOVATION-ORIENTED COOPERATION OF RESEARCH INFRASTRUCTURES



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MERIL

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SME GUIDE FOR ACCESS TO RESEARCH INFRASTRUCTURES

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HOW EFFICIENTLY DOES THE EU SUPPORT RESEARCH AND INNOVATION IN SMES

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SERVICES CATEGORIES OFFERED BY RESEARCH INFRASTRUCTURES FOR INDUSTRIES

MAIN TYPES OF SERVICES PROVIDED TO USERS

1) Access service

- a) Access to data
- b) Access to aggregators
- c) Access to facilities
- d) Access to equipment

2) Analysis service

- a) Data analysis services
- b) Material analysis services

3) Expertise (consultancy) service

4) Data Management

- a) Maintenance service
- b) Data storage service

5) Material processing service

- a) Material maintenance and modification
- b) Material production service
- c) Materials testing and validation
- d) Materials storage service

6) Support service

- a) Project development
- b) Development of models and tools
- c) Development of solutions

7) Training and education service

8) Transport service

This classification does not reflect on a potential third level of services, which may be more specific to science fields

**LET'S START THE
COLLABORATION
WITH THE RIs**