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Module 3. Capacity-Building for Researchers

UAL, IPC

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Circular

Unit 3.1 Key steps in circular economy research implementation

Unit 3.2 Organizational aspects in circular economy research

Unit 3.1 Key steps in circular economy research implementation

Starting the process of creating a research project involves several steps that help structure and guide the research.

Here are the essential steps to begin:

1. **Literature review**
2. **Identify key topics**
3. **Emerging trends**
4. **Gap analysis:**
5. **Evaluation of research opportunities**
6. **Engage with stakeholders**
7. **Synthesise findings.**

After this initial exploratory phase, you start to construct the research project in a more detailed and structured manner.

Here are the next steps:

Unit 3.1 Key steps in circular economy research implementation

Identification of the Problem:

What I intend to study: Clear definition of the research topic.

Starting hypotheses: The initial assumptions or questions the research seeks to explore or answer.

Objectives: The specific and general objectives aimed to be achieved with the research.

State of the Art:

Most significant works: Reference to the most important studies and research on the topic in recent decades.

Theoretical debates: Summary of the current state of theoretical debates on the topic.

Main findings and points of contention: The main discoveries and existing controversies in the literature.

Brief Framework:

Historical, sociological, comparative, etc.: Contextualization of the topic from different perspectives.

Justification of relevance: Explanation of the scientific and/or social importance of the topic to be studied.

Theoretical-Methodological Analysis Grid:

Main concepts, taxonomies, models, or theories: Detailed description of the concepts and theories that will guide the research.

Guidance for research and data treatment: How these theoretical elements will be applied in data analysis and writing.

Sources and Resources:

Archives, libraries, documentation centers, and museums: Indication of the locations and sources that will be explored to build the documentary corpus.

Profile of interviewees and/or surveys: Description of the people to be interviewed or the questionnaires to be applied, including the objective, target audience, and methodology.

Timeline:

Tasks x Months: Project planning organized into tasks distributed over the months.

Activity Plan: Preparation of a detailed timeline with all the activities to be carried out throughout the project.

Deadlines: Definition of deadlines for each stage of the project, from the literature review to data analysis and the writing of the final report.

Unit 3.1 Key steps in circular ec implementation

- **Budget:**
  - ✓ **Required Resources**: Specification of the finan needed to execute the project.
  - ✓ **Cost Justification:** Detailed explanation and ju

- **References:**
  - ✓ **Sources Used:** Complete list of bibliographical preparation of the project, following appropric APA, etc.).

- Scopus: https://www.elsevier.com/products/scopu
- Web of Science: https://www.webofscience.com/u
- GreenFILE: https://www.ebsco.com/products/rese
- Science Direct: https://www.sciencedirect.com/
- PubMed: https://pubmed.ncbi.nlm.nih.gov/

Resources Funding

❑ **Government Agencies**:

- FCT (Foundation for Science and Technology, in Portugal): Offers scholarships and funding for research projects in various fields of knowledge.
- CNPq (National Council for Scientific and Technological Development, in Brazil): Funds scientific and technological research and provides scholarships for researchers.
- NSF (National Science Foundation, in the USA): Funds research in science and engineering.
- European Research Council (ERC): Offers funding for cutting-edge research in Europe.

❑ **International Organizations:**

- UNESCO: Funds projects that promote education, science, and culture.
- World Health Organization (WHO): Offers funding for research related to public health. The World Bank: Funds development projects, including applied research in various areas.

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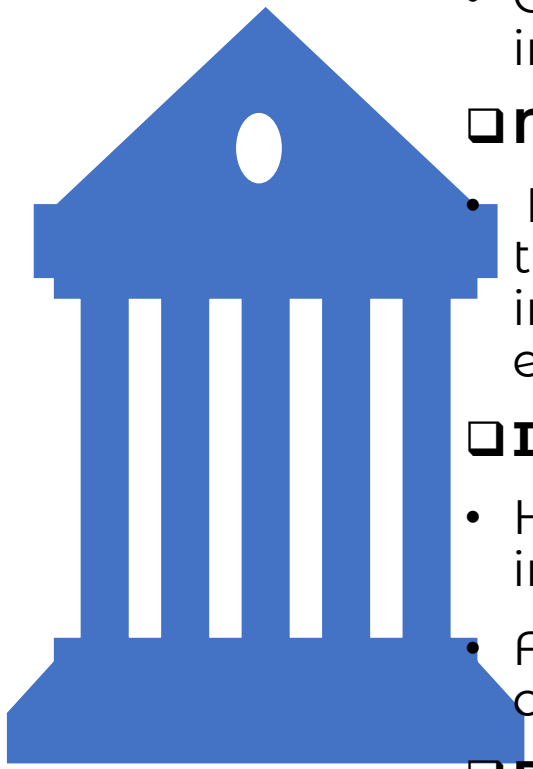
- **Private Funds and Foundations:**
  - Bill & Melinda Gates Foundation: Funds research projects in global health, development, and education.
  - Wellcome Trust: Offers funding for biomedical and health research.
  - Calouste Gulbenkian Foundation (in Portugal): Funds projects in the areas of science, education, arts, and charity.
  - La Caixa Foundation
- **Universities and Academic Institutions:**
  - Internal Scholarships:
  - Many universities offer internal scholarships and funding for research projects by their students and faculty.
  - Research Centers: Some universities have research centers with funds allocated to support specific investigations.



❑ **Companies and Industry:**

- Public-Private Partnerships: Collaborations between universities and private companies to fund applied research that benefits both sectors.
- Corporate Grants: Some companies offer grants for research and development in areas of mutual interest

❑ **Non-Governmental Organizations (NGOs) and Charitable Institutions:**

- Local and International NGOs: Many NGOs finance research that aligns with their missions and objectives. Charitable Institutions: Some charitable institutions offer funding for research in specific areas such as health, environment, or education.

❑ **International Cooperation Programs:**

- Horizon Europe: European Union program that funds research and innovation in various fields.
- Fulbright Program: Offers scholarships for research and teaching in various countries.

❑ **Research Councils and Academies:**

Council for Humanities and Social Sciences Research: Funds research in these areas. Academy of Sciences: Many national academies of sciences offer grants and scholarships for research projects.

To obtain funding, it's essential to

Develop a good project:

With clear objectives, a well-defined methodology, and solid justification. Research opportunities

Stay informed about deadlines and requirements for each funding source

Write a convincing proposal:

Highlight the relevance and potential impact of the project.

Seeking funding can be a competitive process, but with a well-planned project and a well-crafted proposal, your chances of success increase significantly.

GUIDE TO WRITE A PROPOSAL

https://former.fct.pt/apoios/projectos/guiao_en.pdf

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- EXAMPLES

https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

https://www.hezelburcht.com/en/grants/horizon-europe-food-bioeconomy-natural-resources-agriculture-and-environment/

https://www.worldbank.org/en/events/2016/02/18/calls-for-proposals-for-the-strategic-research-program

https://www.unesco.org/creativity/en/ifcd/apply

Unit 3.2. Organisational aspects in circular economy research

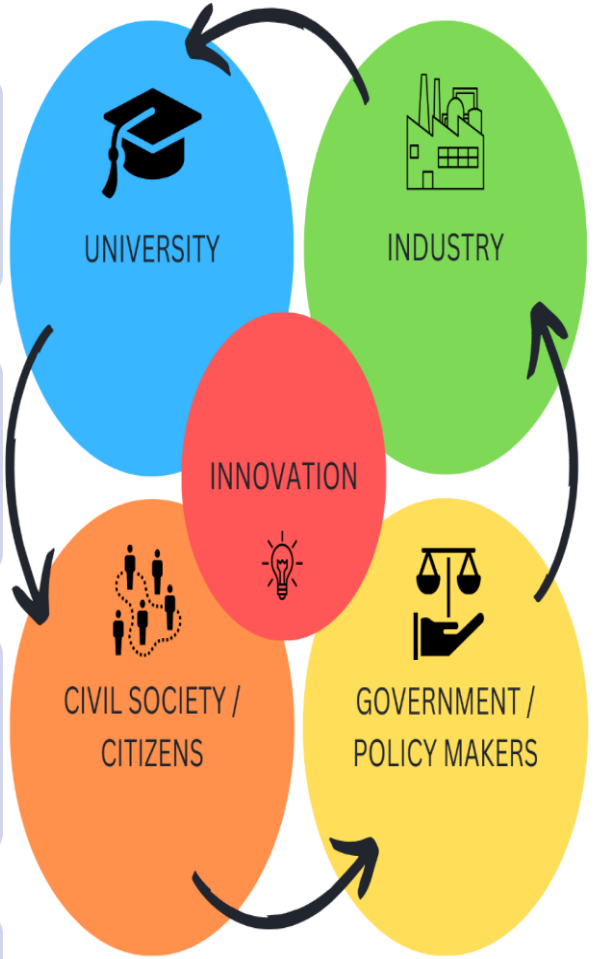
Key Points on Fostering the Quadruple Helix:

Practical Implementation: Focus on practical application over academic discourse. Share successful practices and interaction mechanisms among territorial authorities to demonstrate the benefits of helix models.

Civil Society Engagement: Integrate civil society into helix strategies to leverage its innovative potential. Civil society's involvement aids consensus-building in policymaking and enhances innovation efforts with minimal resources.

Data Clustering and Analysis: Use helix-based clustering to assess a territory's strengths, weaknesses, opportunities, and threats. This method helps decision-makers improve helix strategies and inform strategic planning.

New Indicators: Universities should develop new indicators and enhance existing ones to measure knowledge and innovation effectively.



The Quadruple Helix.
Source: Own design by the author of the module with Canva.

Key Points on Fostering the Quadruple Helix:

- **University's Entrepreneurial Role: Improve universities' innovation performance by boosting their roles in technology and knowledge transfer to policymakers and industry actors.**

- **Regional Specialisation: Focus on regional specialisation and enhance civil society's innovative potential through social inclusion and bottom-up approaches. Ensure connectivity among all Quadruple Helix actors.**

- **Enhanced Interactions: Improve interaction opportunities within the Quadruple Helix to facilitate the transfer and utilisation of high-value knowledge from universities to industry and civil society.**

- **Innovation Culture in Public Administration: Share successful practices among public administrators and involve innovation professionals to modernize public administration and operationalize the helix model.**

- **Structured Information Sharing: Create structured environments for information sharing tailored to specific stakeholders, whether physical or virtual.**

- **Institutional Structures for QHCs: Establish formal procedures for partner selection, reporting, and communication, and co-create a shared vision. Ensure ongoing efforts, secure funding, and build trust through clear communication channels and legal instruments.**

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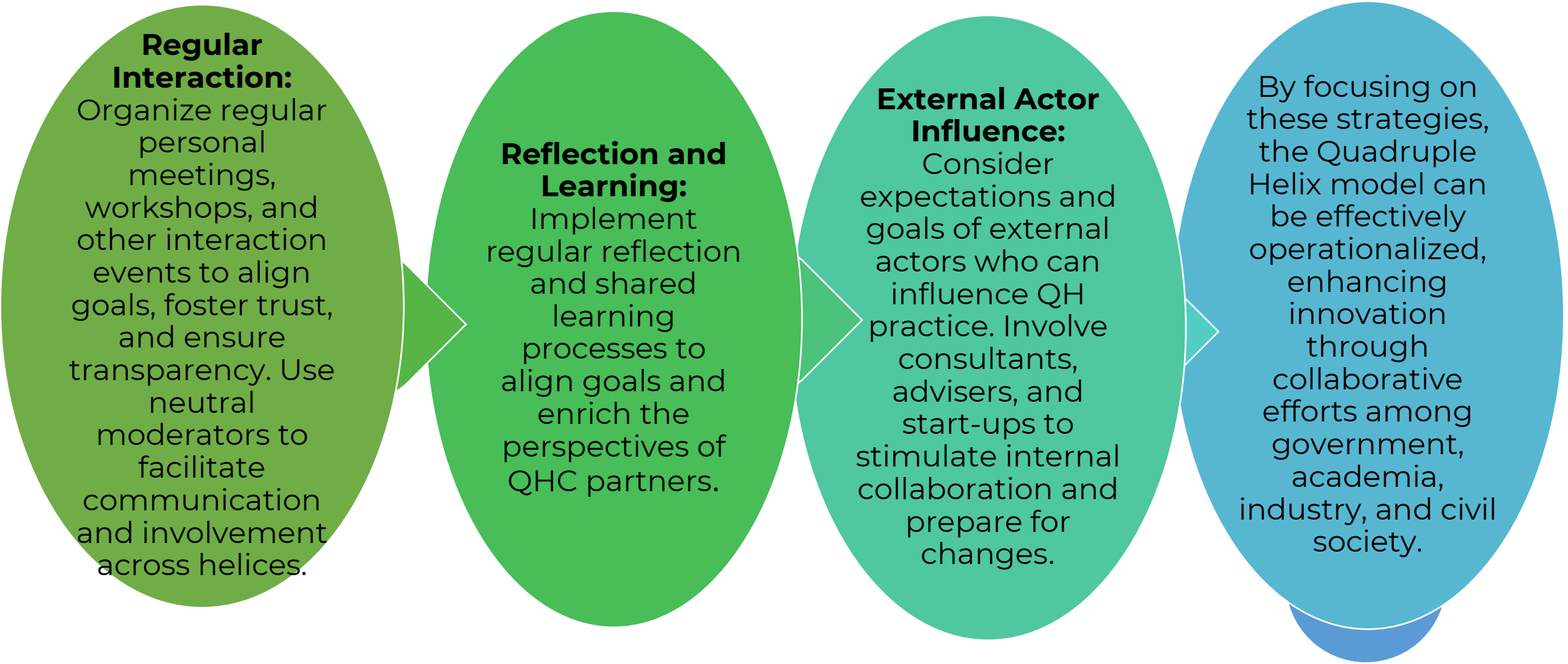


The Portuguese Science, Technology, and Innovation System

FCT Fundação para a Ciência e a Tecnologia

- a) R&D institutions, namely:

R&D Units are the core of the Portuguese scientific and technological system. They are organized structures of a public or private nature that include human resources, equipment and technical infrastructure active in R&D, advanced training and scientific dissemination, working in all scientific fields and spread throughout the country

- i) R&D units;
  - The basis of the national scientific and technological system organization are the R&D units. The R&D units are made up of human resources, equipment and technical infrastructures dedicated to R&D, training and scientific and technological dissemination. An

·ii) State laboratories;

·State laboratories are legal entities public institutions of an institutional nature, created and maintained with the explicit purpose of pursuing policy objectives scientific and technological approach adopted by the State, through the pursuit of R&D activities and other types of activities scientific and technical activities provided for in the respective laws organic, such as service provision activities, support for the productive fabric, expertise, standardization, certification, metrology, regulation and others.

·i) R&D units;

·The basis of the national scientific and technological system organization are the R&D units. The R&D units are made up of human resources, equipment and technical infrastructures dedicated to R&D, training and scientific and technological dissemination. An R&D institution can integrate one or more R&D units.

❑ b) Collaborative laboratories;

- Collaborative laboratories are R&D institutions focused on short- and medium-term research and innovation agendas to create qualified employment and economic and social value.
- The FCT grants the status of a collaborative laboratory for a renewable five-year period to non-profit associations or commercial companies. Evaluation criteria include:
- a) Scientific and technological merit and innovation potential;
- b) Stimulation of qualified employment;
- c) Relevance, diversity, and impact of the strategic research and innovation agenda;
- d) Effective collaboration with productive, social, and cultural entities, coordination with higher education, and diversification of funding sources;
- e) Creation of new R&D hubs across the national territory, including low-density areas.

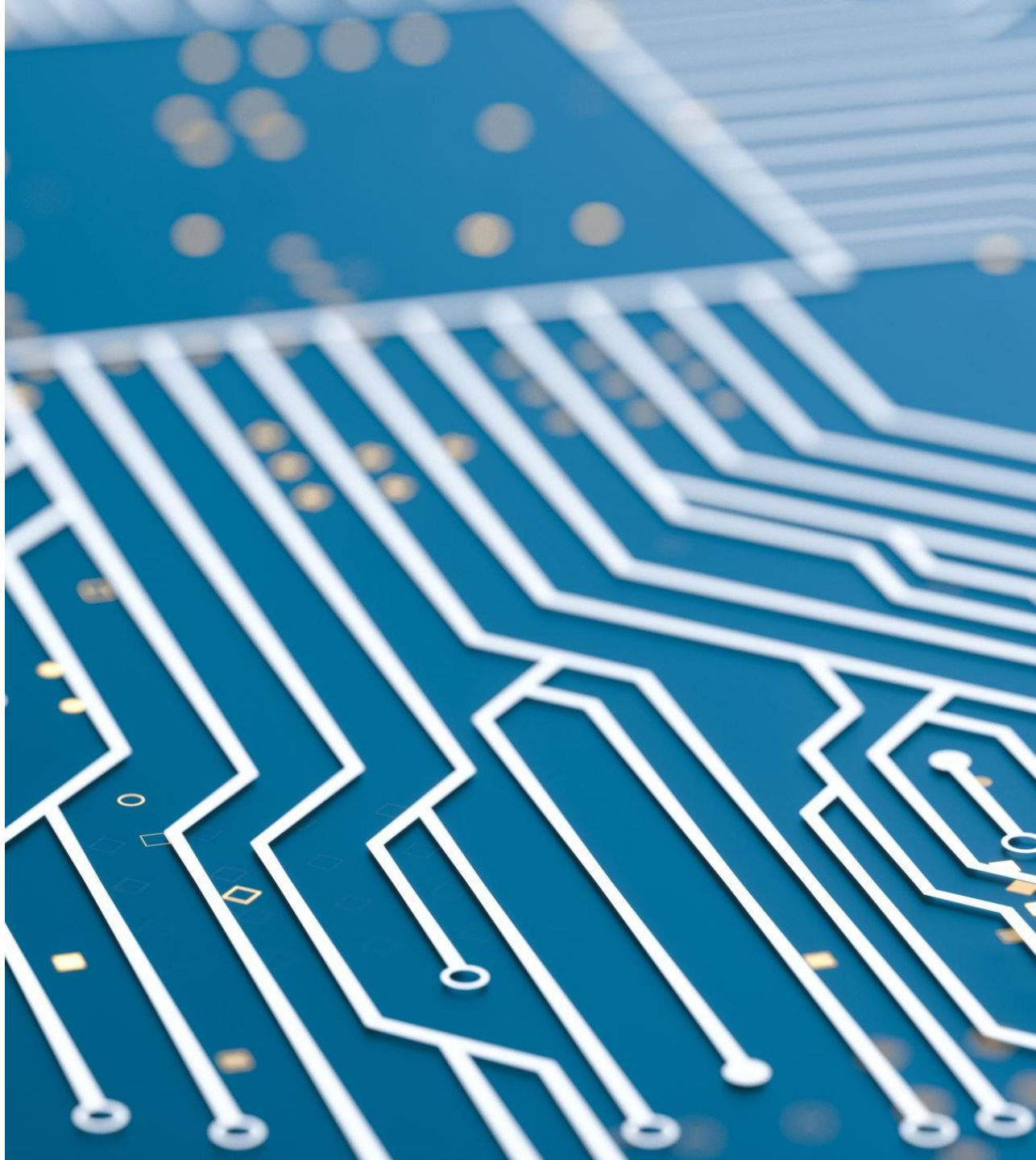
unit 3.2. Organisational aspects in circular economy research

❑ c**) Technological interface centers;**

Technological interface centers accelerate the integration of high-value, knowledge-based processes, services, or products into companies and the productive sector. They include:

a) Technological centers providing technical and technological support to specific or related industrial sectors;

b) Technology transfer centers promoting emerging sectors and incorporating general-use technologies into traditional sectors to enhance competitiveness.

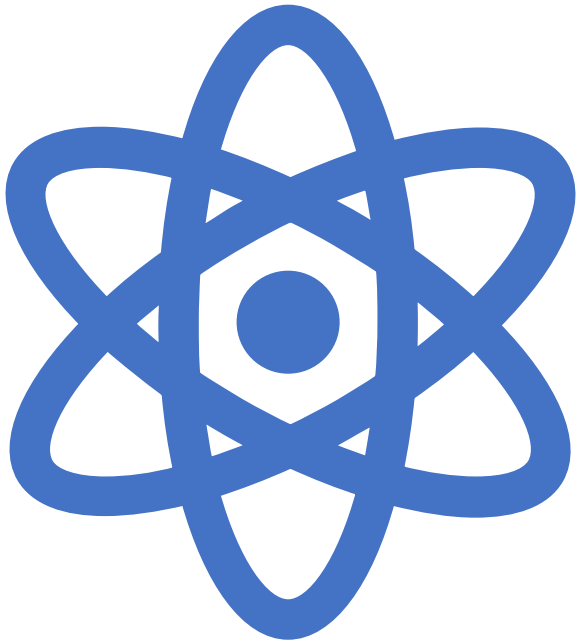


❑ d) Science and technology infrastructures

- Science and technology infrastructures are platforms and services used by R&D institutions to provide resources to the scientific community, including large-scale equipment, scientific instruments, data archives, computational systems, and communication networks, aiming to create and share scientific knowledge, including international collaboration.

❑ e) Science and technology networks and consortia.

- Science and technology infrastructures encompass platforms, resources, and associated services utilized by R&D institutions or other entities to provide resources and services to the scientific community.
- These include large-scale equipment, scientific instrument sets, collections, and other knowledge-based resources, archives and scientific data, computing and programming systems, and communication networks to create and disseminate scientific knowledge, including participation in internationalization processes.
- Science and technology networks and consortia can also be established by government initiative, through an order issued by the government member responsible for the area of science



The STI Act of 1st June 2011 defines the Spanish Science, Technology, and Innovation System as a coordinated framework integrating national and regional policies

The Ministry of Science, Innovation, and Universities leads research, innovation, and international relations efforts, including representing Spain in global programs and organizations.

Other ministries also contribute to R&D&I policy at various stages

https://www.euraxess.es/spain/information-assistance/spanish-science-technology-and-innovation-system

- **The Spanish System of Science, Technology and Innovation** (SECTI, in its Spanish acronym) is composed by all public and private agents coordinating, funding and executing, together with their networks, structures and actions for promoting, developing and supporting- RD&I in Spain, together with all their promotion, development and support networks, structures and actions.

❑ **The Spanish Research Bodies**

- Public Research Bodies (Organismos Públicos de Investigación, OPIs) are organizations that directly carry out scientific and technical research, provide technological services, and carry out other, complementary activities necessary for society's scientific and technological progress.
- **The Spanish National Research Council (CSIC),**
- **The Research Centre for Energy, Environment and Technology (CIEMAT),**
- **The Carlos III Health Institute (ISCIII),**
- **The Institute of Astrophysics of the Canary Islands (IAC)**

❑ Severo Ochoa Centers and Units of Excellence

- SOMMa is the ‘Severo Ochoa’ Centres and ‘María de Maeztu’ Units of Excellence Alliance have the mission of internationally promoting, strengthening, and maximizing the value and impact of their ground-breaking research.
- SOMMa centres and units cover a wide range of scientific disciplines, from life sciences and medicine, mathematics, chemistry, physics, and engineering, to humanities, economics, and social sciences.

SOMM
EXCELLENCE
ALLIANCE

- **The University System**

- 75% of the Spanish research activity takes place at the university, and around 45% of the research workforce is found at the universities. University professionals can teach and research

- https://iune.es/

Unit 3.2. Organisational aspects in circular economy research

Implementing Circular Economy principles within public sector organizations holds promise for accelerating sustainability efforts beyond current sustainable development endeavors.

Given the pivotal role of the public sector in this transition and the unique characteristics of public organizations, it is crucial for them to embed Circular Economy principles into their resource management practices at the organizational level.

Collaboration, stakeholder engagement, and raising awareness emerge as crucial elements for fostering a substantial shift towards circularity.