

EARTO Paper:

Capturing Official Data on the RTO Sector for a Better Understanding of the RD&I Ecosystem

23 December 2021

Contents

1. Introduction.....	2
2. Lack of official OECD/EUROSTAT data on the RTO sector.....	3
3. RTOs as one type of Public Research Organisations	4
4. List of criteria to define the RTO sector	5
5. Recommendations towards OECD and EUROSTAT data on RTOs.....	6
Annex 1 - Official statistics on independent research institutes in Norway.....	9
Annex 2 - Criteria officially used at national level to define the RTO Sector.....	11

1. Introduction

Overcoming the challenges that we jointly face at global level, such as generating shared prosperity, resilience and peace on a sustainable and healthy planet, and achieving the [Sustainable Development Goals \(SDGs\)](#) by 2030, requires ambitious and concrete actions. The importance of Research, Development and Innovation (RD&I) for achieving such goals has long been recognised, including by the [United Nations](#) and the [OECD](#). RD&I policies can be a key enabler, if they are put in place in an efficient manner, adapted to the specificities of the different actors of the RD&I ecosystem to leverage their potential.

For RD&I policies to be realistically adapted to the context and the needs of the sector it affects, data-driven decision-making is crucially needed. In its [Communication on the Better Regulation – Joining forces to make better laws](#), the EC stresses that *"Given this Commission's ambitious agenda and the unprecedented challenges we are facing, the need for strong analysis and reliable evidence is greater than ever"*. The EC adds that *"Scientific evidence is a cornerstone of better regulation, vital to establishing an accurate description of the problem, a real understanding of causality and therefore intervention logic; and to evaluate impact."* In its [Regulatory Policy Outlook 2021](#), the OECD highlights that *"enhanced oversight will be critical to ensure that decisions are based on the best available evidence, consider all relevant impacts and contribute to greater societal resilience"*.

Today the OECD and EUROSTAT capture quite well the role of a few key actors in the RD&I ecosystem:

- government, including public funding for RD&I programmes,
- universities, including both their education and research activities,
- industry, including private investments in RD&I from small and large companies.

Data on these actors are easily accessible from the OECD and EUROSTAT databases, and can be used directly by policymakers for better evidence-based policy making, or by researchers to produce data-driven analysis of the different trends in the sector that then can feed into the design of new policies.

However, OECD and EUROSTAT data on Research and Technology Organisations (RTOs), is direly lacking (and even on Public Research Organisations – PROs for that matter), despite the key role they play in the RD&I Ecosystem¹ and in RD&I competitive programmes like EU Framework Programmes², and the impact they deliver on the economy and for society³. RTOs are great supporters of EU RD&I policies thanks to their long experience of collaboration across the whole value chain, transferring knowledge and technology to the market. RTOs are ideally suited to manage existing and build new ecosystems and clusters that are driven by value-chains.

EARTO Recommendations:

It is only with a complete picture of the RD&I ecosystem that policymakers can design evidence-based policies that are comprehensive, well targeted and effective. EARTO thus strongly encourages the OECD, EUROSTAT and the European Commission to rethink the way they categorise RD&I actors and to start collecting specific and robust data on the RTO sector.

EARTO has three recommendations to improve the classification of RD&I actors so that it more realistically reflects the RD&I Ecosystem:

- **Recommendation 1: The Frascati Manual decision tree should be updated by adding a separate category for RTOs (or at least PROs), clearly distinguishing them from universities, industry, governments and other not-for-profit organisations.**
- **Recommendation 2: Prior to the next update of the Frascati Manual, RTOs (or at least PROs) should be marked as specific units in official statistics at national levels so that data on the whole RTO sector can then be grouped at OECD/EUROSTAT levels.**
- **Recommendation 3: A dedicated Code for RTOs should be created in the European Nomenclature of Economic Activities (NACE) and in the United Nations' International Standard Industrial Classification (ISIC).**

This key topic should also be discussed by national statistics offices and governments in the relevant settings at OECD and EUROSTAT levels, so that the approach can be coordinated.

¹ See [EARTO Recommendations for European RD&I Policy Post-2020](#), 2019

² See [EARTO Paper on the Position of RTOs in the EU Framework Programmes](#), 2021

³ See [EARTO Economic Footprint Study – Impact of 9 European RTOs in 2016](#), and the [presentations on « The role of RTOs to deliver Impact on the economy and for society »](#) during the CONCORDi Conference 2021

2. Lack of official OECD/EUROSTAT data on the RTO sector

Despite the importance of the RTO sector in Europe, no official data has been collected so far by official institutions like the OECD or EUROSTAT. The OECD's methodology for collecting and using R&D statistics is detailed in the [Frascati Manual](#), the guidelines for collecting and reporting data on research and experimental development, which has last been updated in 2015. This methodology is internationally recognised and widely used by institutions at all levels, and in particular by EUROSTAT and by most DGs of the European Commission. Such Manual includes definitions of basic concepts, data collection guidelines, and classifications for compiling R&D statistics.

Following this Frascati Manual, the OECD and EUROSTAT both consider four main institutional sectors where R&D is performed:

- The business enterprise sector (BES)
- The government sector (GOV)
- The higher education sector (HES)
- The private non-profit sector (PNP) – which covers “*non-market, private non-profit institutions (NPI) serving households (i.e. the general public) and private individuals or households. These provide individual or collective services to households either without charge or at prices that are not economically significant. They include NPIs such as professional or learned societies, charities, relief or aid agencies, trades unions, consumers' associations, etc.*”

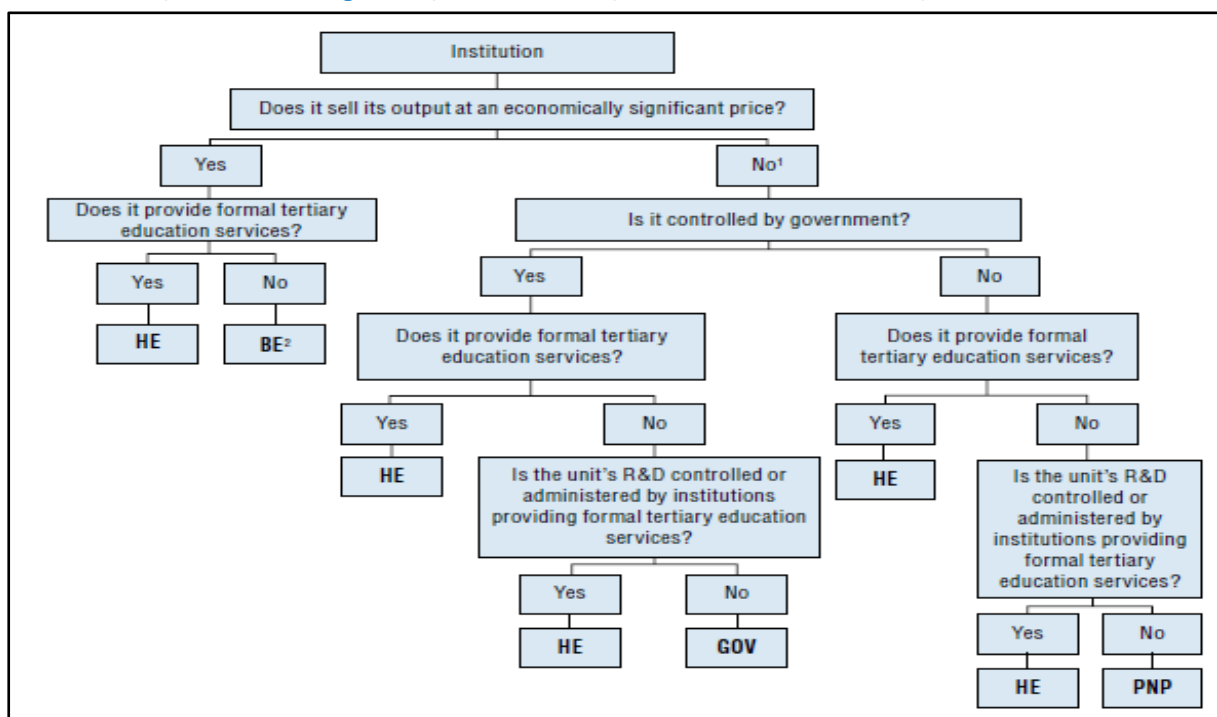


Figure 1: Decision-tree for sectoring R&D units (OECD - 2015)

The criteria for the classification of research actors are presented in the Frascati Manual decision-tree (Figure 1).

However, if these criteria are strictly applied, a considerable number of “borderline cases” will necessarily be found. Several of these cases are used as examples in the Manual, among which are “*Research Institutes*” which is a term that has been introduced in the last 2015 update of the Frascati Manual. In other words:

- RTOs are not captured within their own institutional sector, they have to be included in either the Government sector or the Business sector, and if they fit in none of the two, they end up in the Private non-profit sector (de facto default category which includes all the organisations that do not fit within the above-mentioned ones).
- RTOs often fall in-between these categories making them difficult to classify: they could be included in all the categories depending on the way the RD&I system is set-up nationally, or on the interpretation of the questions of the Frascati Manual decision tree (i.e. does receiving basic funding and having a public mandate qualifies as being “controlled by government?”).

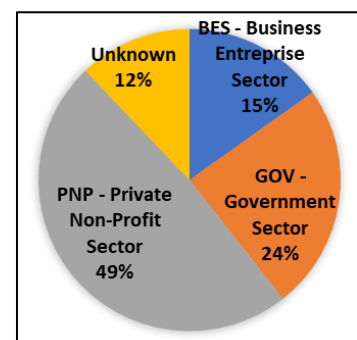


Figure 2: Classification of 33 RTOs based on the Frascati Decision Tree (EARTO – 2021)

As a consequence, RTOs are not included in the same category in the different OECD countries, which ineluctably tweaks the comparability of RD&I statistics across countries. For instance, in countries where RTOs are classified in the business enterprise sector, the governments would appear to much more finance the business enterprise sector than in countries in which RTOs are classified in the government sector. This also leads to question the value of the aggregated R&D data at OECD and EUROSTAT levels.

Confronted with such cases, the Frascati Manual acknowledges that *“a single classification scheme may not be sufficient on its own to meet the varied and increasing range of user interests in R&D statistics”* (3.18 page 87). It also adds that *“this approach should be kept in focus, particularly for international reporting, while allowing for a number of more flexible, complementary approaches”* (3.26 page 89). Indeed, this map of the institutional sectors where R&D is performed is too simplistic to properly reflect the diversity of RD&I ecosystems, and it clearly fails to take into account the specific nature of RTOs. It should be revised and improved to better reflect such diversity and more accurately inform policymakers throughout the policy making process (from the design of new policy to ex-post impact assessment).

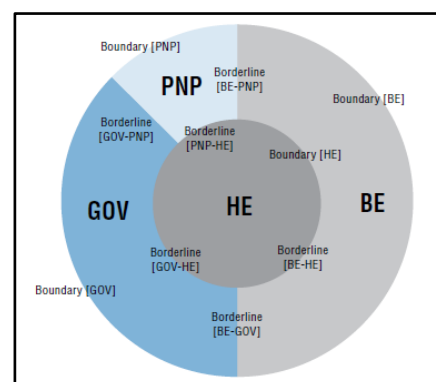


Figure 3: Frascati Institutional sectors and their borderlines (OECD - 2015)

In addition, the Frascati Manual’s sector classification is closely related to that recommended by the United Nations System of National Accounts (SNA). Such SNA is an international standard system of national accounts put in place by the UN and aiming at providing an integrated, complete system of accounts enabling international comparisons of all significant economic activity. It is also important to note that even though most categories of the Frascati Manual are indeed taken from the SNA, the category “Higher Education” does not exist as a separate category in the SNA, and it has been created for the Frascati Manual. The argument behind the creation of such category is that it is needed to “reflect policy-relevant categories” of research institutions: *“The Higher Education sector does not have a direct counterpart in the SNA group of institutional sectors. It is unique to this manual and is defined to reflect a policy relevant category of R&D-performing institutions”*. The RTO sector (and more general PROs) is in the exact same situation today, and this needs to be remedied for the exact same reasons: reflecting a policy-relevant category of Public Research Organisations.

3. RTOs as one type of Public Research Organisations

In the studies that have been carried out on the RTO sector so far, RTOs are often considered as a sub-category of the broader Public Research Organisations’ (PROs) sector.

3.1 OECD Innovation Policy Platform: 4 types of research organisations

The Innovation Policy Platform of the OECD⁴ has published in 2011 an article studying PROs which are defined as *“an heterogeneous group of research performing centres and institutes with varying degrees of ‘publicness’”*, which is *“understood in broad terms as the level of governmental influence on their research activities and funding, rather than just mere ownership”*. In this paper, PROs are divided into four ideal-types, as shown in the table below.

Ideal types	Status	Main focus	Examples
Mission oriented centres (MOCs)	Owned and sometimes run by government departments or ministries at the national or sub-national level	Perform research in specific topics or sectors, and support policy making	National research centres specialised in energy and environment (CIEMAT in Spain), health (INSERM in France), etc.
Public research centres and councils (PRCs)	Overarching institutions of considerable size	Perform (and sometimes fund) basic and applied research in several fields	CNRS in France, CNR in Italy, CSIC in Spain, Max Planck Society in Germany, etc.
Research technology organisations (RTOs)	Also known as industrial research institutes, Often in the semi-public sphere, not for profit.	Link research and private sector innovation; transfer of S&T to the private sector and society	Fraunhofer Society in Germany, TNO in the Netherlands, VTT in Finland, Tecnalia in Spain, SINTEF in Norway
Independent research institutes (IRIs)	Semi-public founded under different legal forms, at the boundaries between the public and private sector	Perform basic and applied research focused on issues or problems	“Centres of excellence”, “cooperative research centres”; “engineering research centres”, CNIO in Spain

Table 1: Ideal types of Public Research Organisations (OECD Innovation Policy Platform)

⁴ Policy brief on public research organisations (PROs), OECD Innovation Policy Platform, 2011

This classification, even though not optimal since the distinction between the different sub-categories would gain to be clarified, is already a good first attempt at mapping the sector. So far, this categorisation has not been used for the collection of RD&I data for the OECD and EUROSTAT.

3.2 Technopolis Group: 3 types of research organisations for data collection

In their study on the Research Institutes in the European Research Area (2010), Technopolis Group stressed that one of the reasons why research organisations “do not occupy the place they deserve in research and innovation policy discussions” is because they are treated indistinctly in a sort of “bucket category that contains many heterogeneous organisations”⁵. Technopolis Group has defined three types of PROs as detailed in the table below, acknowledging that some multidivisional organisations could be included in more than one of these ideal-types.

Ideal types	Status	Main focus	European examples
Scientific Research Institutes	Origins in Research councils or Academies of Science. Both research funding & performing. Very high proportion of core funding in their income.	Tend to do fundamental or applied science, largely do the same kind of research as universities.	Max Planck institutes (Germany), CNRS (France), national academies of science in new member states.
Government Laboratories	Can be referred to as “sector institute”, generally state-owned. High part of income from the ministry whose policy mission they support.	Focus on producing public goods to meet knowledge needs of the state & society. They deliver services and policy-relevant information to government.	Nuclear research, marine institutes, and metrology, etc.
Research technology organisations (RTOs)	“Applied research institutes”, originating from testing laboratories and product & process developers for industry. Earn greatest part of funds competitively. Use public funds to create the knowledge & capabilities needed to support customers.	Tackle the needs of industry for knowledge related services. Focus on user or problem-oriented research for the benefit of society. Assume some of the risks of industrial innovation, helping companies go beyond what they would be able to do based on their technological capabilities.	Large scale examples include Fraunhofer in Germany, VTT in Finland, TNO in the Netherlands, but there are also smaller and more specialised institutes.

Table 2: Ideal types of research organisations categories (Technopolis Group)

This classification from Technopolis of the different ideal types of PROs has some similarities with the one from the OECD’s Innovation Policy Platform. Technopolis’ “scientific research institutes” and “government laboratories” categories can be respectively linked to OECD’s “public research centres” and “councils and mission-oriented centres” categories. However, Technopolis does not differentiate RTOs from “independent research institutes”, which actually provides a clearer distinction between the different ideal types of PROs.

Technopolis’ three subcategories of PROs could be taken as a starting point, improved, and used by the OECD and EUROSTAT to gather more precise statistic data about the PRO sector in general, and about the different sub-types of PROs (including RTOs) in particular. This would enable policymakers to have a more representative statistical picture of the RD&I Ecosystem.

4. List of criteria to define the RTO sector

Collecting statistical data on the RTO sector requires an alignment across countries on a common definition of RTOs. While the above-mentioned definitions (see table 1 and 2) by the OECD Innovation Policy Platform and by Technopolis provide the basis for a common definition of the RTO sector, listing a key set of criteria that enable to clearly distinguish RTOs from other RD&I actors, including from other PROs, is essential.

To do so, EARTO listed the definitions and criteria that are used by governments at national and/or regional levels to define the RTO sector (see Annex 2). The full list was used to determine the main criteria that are most commonly used at national level, and which can also encompass in their scope the RTOs from countries where there is no official definition of the RTO sector.

⁵ [Research Institutes in the ERA](#), Technopolis Group, 2010

The list of the main criteria which can be used to define the RTO sector are the following:

- **RTOs are not-for-profit organisations:** they are not universities (their main purpose is not education), and they are not industry (they do not pay dividends). Any profits that RTOs make are re-invested into RD&I purposes.
- **RTOs' funding mix includes both private and public funding (basic and/or competitive):** different shares can vary depending on the country, but they most of the time have a minimum share of 15% of private funding.
- **RTOs' primary purpose is to independently conduct excellent applied research,** mostly in collaboration with public and private partners, building on fundamental research to reach advanced experimental development, and to widely disseminate the results of their research activities. For this they possess highly qualified research and technology knowledge, expertise and infrastructures.
- **RTOs play an intermediary role in the RD&I Ecosystem:** they transfer knowledge and technology to the private sector and society, and most of them have a long-term scope with technology foresight capabilities.
- **RTOs have a public mandate given by their national/regional government to deliver impact on the economy** (i.e. by strengthening industrial competitiveness and job creation), **and for society** (i.e. delivering on the global sustainable challenges). Many RTOs also play a key role to support the design of relevant and efficient public policies in a wide range of sectors.

With regards to this list of criteria, it is also important to note that:

- RTOs' legal status (organised under public or private law) is not relevant, as it heavily depends on national/regional RD&I policies and strategies. However, RTOs are most of the time in between the public and the private spheres: they receive public funding (basic and competitive), but they also secure private funding, and RTOs' staff is very rarely civil servants.
- In general, RTOs' funding mix heavily depends on the national RD&I policy and strategy. For instance, within RTOs' public funding, the split between basic and competitive funding can vary significantly depending on the accessibility of these types of public funding mechanisms (e.g. in Norway RTOs have very limited basic funding, while in Canada RTOs have almost no competitive funding).
- Some RTOs can also carry out some basic research themselves, and some can also reach advanced experimental development at high Technology Readiness Levels (TRLs), but in general the majority of the work of RTOs is focused on applied research at intermediary TRLs.
- Most of the activities carried out by RTOs are of a collaborative nature, including in the frame of their bilateral agreements with their private partners (e.g. common objective and fair division of labour, jointly defined scope, contributions by all partners, risk sharing, result accessibility reflecting the work conducted, dissemination of results, etc.).

In general, the RTO sector remains diverse, and the whole set of criteria mentioned above should be understood as an ideal-type, which heavily depends upon the specificities of the national/regional RD&I system, public policies and strategy. Some RTOs will therefore not fulfil them all. A better understanding of the diversity of the RTO sector could also be further explored, providing for instance a sub-typology of RTOs.

5. Recommendations towards OECD and EUROSTAT data on RTOs

RTOs, which are part of the wider Public Research Organisations' sector, include a somewhat diverse range of RD&I actors which heavily depends on the national RD&I context. This is certainly one of the reasons why data on RTOs have not been collected so far. However, despite their heterogeneity and various legal forms, RTOs share functional specificities that distinguish them from other RD&I organisations.

Capturing data on RTOs at OECD and EUROSTAT levels is therefore essential to improve policymakers' understanding of RD&I ecosystems, for better evidence-based policy-making. To that end, EARTO provides the following recommendations to the OECD, EUROSTAT and the European Commission:

- **Recommendation 1: Update the Frascati Manual decision tree by adding a separate category for RTOs (or at least PROs), for a more realistic categorisation of RD&I actors.**

During the next update of the Frascati Manual, capturing data on RTOs as a separate RD&I institutional sector will be key to put in place, clearly distinguishing them from universities, industry, governments and other not-for-profit organisations like charities.

This revision needs to take into account the specificities of the RTO sector, as detailed under §4. For this, the upcoming [OECD report on the RTO sector](#) is very much welcome, and it will be key to inform this revision of the Frascati Manual. The OECD NESTI Committee should also make sure that all RD&I actors are involved throughout the Frascati revision process, with the objective of providing a more realistic representation of the RD&I ecosystem in official RD&I statistics in the future.

This would enable to include all RTOs into the same category in the Frascati Manual decision tree, thereby easing the comparability of RD&I statistics between countries. This would also constitute a clear recognition of the singular role played by the RTO sector in the RD&I ecosystem, and provide a more realistic picture of the RD&I ecosystem and their actors, increasing the value of the aggregated data collected at OECD and EUROSTAT levels especially for policymakers.

- **Recommendation 2: Mark RTOs as specific units in official statistics at national levels so that data on the whole RTO sector can then be grouped at OECD/EUROSTAT levels.**

Prior to the next update of the Frascati Manual and the implementation of Recommendation 1 above, this transitory approach could support a faster collection of data on the RTO sector and improve preparedness prior to the full revision of the Frascati decision tree. This approach would consist in marking/tagging RTOs as specific statistical units by national statistics offices, based on the common definition of the sector provided in §4 above and in the upcoming [OECD report on RTOs](#).

This approach is actually suggested in the Frascati Manual itself: “additional tools” should be used for “*the pursuit of coordinated analysis of R&D micro-data in different countries, in order to address questions that cannot be readily assessed through standard indicators*”, which is the case for RTOs. The Frascati Manual also states that “*statistical agencies can compile comprehensive registers of units to tag them against a number of classifications and relevant descriptors. Similar systems can allow them to address specific national and international user needs on a regular or ad-hoc basis*” (3.48 page 96).

As a start, all national statistics offices at least in European countries should mark/tag RTOs as such in their statistics system, so that EUROSTAT could be able to provide EU decision and policy makers with official data on the RTO sector in Europe. This is already being done in some EU countries like in Norway (see Norwegian Case Study in Annex 1), and discussions are already ongoing in others.

This key topic should also be discussed by national statistics offices and governments in the relevant settings at OECD and EUROSTAT levels, so that the approach can be coordinated and agreed upon. Such discussions could be led by countries that are already capturing data on the RTO sector and using such data to design more efficient RD&I policies and programmes (e.g. Norway – see Annex 2). RTOs, and especially national associations representing the RTO sector, should also be included in these discussions.

- **Recommendation 3: Create a dedicated Code for RTOs in the European Nomenclature of Economic Activities (NACE) and in the United Nations’ International Standard Industrial Classification (ISIC).**

This needs to be implemented in the ongoing revision of the NACE Code by EUROSTAT, as would enable a better characterisation of the RTO sector in the statistical classification of economic activities. So far, RTOs cannot be identified with NACE Codes, which also contributes to limit the possibility to access official data on the sector. A new NACE Code for RTOs would also be essential to harmonise and strengthen the comparability of the statistics gathered on the RTO sector across countries.

The combination of these three recommendations would enable to capture official and comparable data on the RTO sector, which has so far only been done in a few countries, and never at OECD/EUROSTAT levels. This would enable to reflect much more accurately the reality of the RD&I ecosystem and provide for better data capturing the key role of the different RD&I actors, improving the efficiency of evidence-based policy making.

EARTO remains at the disposal of the OECD, EUROSTAT and European Institutions to further discuss these recommendations and support the set-up of this new categorisation of RD&I actors in official statistics.

RTOs - Research and Technology Organisations: *From the lab to your everyday life. RTOs innovate to improve your health and well-being, your safety and security, your mobility and connectivity. RTOs’ technologies cover all scientific fields. Their work ranges from basic research to new products and services development. RTOs are not-for-profit organisations with public missions to support society. To do so, they closely cooperate with industries, large and small, as well as a wide array of public actors.*

EARTO - European Association of Research and Technology Organisations: *Founded in 1999, EARTO promotes RTOs and represents their interest in Europe. EARTO network counts over 350 RTOs in more than 20 countries. EARTO members represent 150.000 highly-skilled researchers and engineers managing a wide range of technology infrastructures.*

Read more on EARTO's previous works linked to this topic:

- [OECD-EARTO Project on the Funding of RTOs: New challenges and opportunities for supporting socio-economic recovery, resilience and transitions](#), workshop presentation available, full report to be published in 2022
- [EARTO Paper on the Position of RTOs in the EU Framework Programmes](#), 2021
- [EARTO Members' presentations on 'The role of RTOs to deliver Impact on the economy and for society'](#), CONCORDi Conference 2021
- [EARTO Recommendations for European RD&I Policy Post-2020](#), 2019
- [Economic Footprint of 9 European RTOs in 2015-2016](#), commissioned to IDEA Consult, 2018 (see also [summary brochure](#))
- [EARTO Memo on EARTO Members' Participation to H2020 – data from EC eCorda database](#), 2016
- [EARTO Paper on EU RD&I Policy and Data-driven Decision-Making – Knowing our innovation ecosystem actors: data on European RTOs](#), 2015

Note

Subject	The Norwegian model for official statistics on independent research institutes
To	Sophie Viscido, EARTO
Copy	Agnes Landstad, FFA
From	Anne Magnussøn, RCN

1. Criteria used to define research institutes in Norway

The Norwegian research system is normally divided into three research-performing sectors;

1. business enterprise sector (BE),
2. higher education sector (HE)
3. **and research institute sector.**

Research institutes can then end up into different categories in the OECD statistics (since the "Research Institutes" category does not exist as such in the Frascati Manual). The National Norwegian R&D survey of the institute sector covers in principle all approved research organisations that are not included in the other two sectors, and which have an R&D element of a certain size⁶. A common characteristic of the institute sector units is that they do not pay dividends and do not sort directly under an educational institution.

The R&D survey for the institute sector in 2020 included about 85 institutions⁷, of which almost half are usually referred to as research institutes. The institute sector can be divided into three groups:

1. **Institutes that receive basic allocation channelled through the Research Council of Norway (RCN)** (currently 32 institutes)⁸
2. Research institutes that receive state grants directly from a ministry and public institutions with R&D activity, but with a different primary purpose (currently 12 institutes)
3. Health trusts (excluding university hospitals), museums and other units in the public and private sector

There are institutions within category 2 like the National Library and The National Archives of Norway that are not "research institutes" as such, although they belong to the institute sector in Norway. There are also institutions in category 3 that define themselves as research institutes although they do not belong to the basic funding system.

Please note that the research institute strategy launched in 2020 by the Norwegian Ministry of Education and Research⁹ includes the institutes in the first two groups only.

2. Requirements to be labelled as a "Research Institute that receive basic funding through the RCN"

The Research Council of Norway has the strategic responsibility to carry out a comprehensive assessment and give advice to the ministries on whether or not a research institute should be taken in or out of the basic funding system (non-competitive basic funding with an average size of approximately 10% of the individual research institute's annual income, comprising a performance-based portion). The basic funding itself shall be used for long-term knowledge and competence building.

This assessment is based on established criteria laid down by a Royal Decree in 2008 through the "[Guidelines for public basic funding of research institutes and research groups](#)" (revised in 2020):

1. **Income from nationally and internationally commissioned research** must comprise at least 25% of total R&D revenues.
2. **Scholarly publication measured by publication points per researcher full-time equivalent (FTE)** must correspond to at least one-third of the average for the institute's arena.
3. **The institute must have at least 20 researcher FTEs.**
4. **The income from funding contributions (e.g. from the Research Council and the EU)** must comprise at least 10% of total R&D revenues.

⁶ The Research Council of Norway provides a list of approved research organisations.

⁷ Not including health trusts and museums.

⁸ Research institutes that are part of the public basic funding system are also members of the association for research institutes; FFA who works for better framework conditions for applied research and the research institutes.

⁹ Kunnskapsdepartementet 2020: *Strategi for helhetlig instituttpolitikk*

5. The other requirements are of research policy nature: two of the requirements apply to the **relationship between the research institute and the superior body / owners** (preferential right to results and dividend), while the last requirement is a **formal requirement of academic freedom**.

3. Four types of “Research Institute that receive basic funding through the RCN”

There are 4 types/“distribution arenas” (according to facilities and users’ groups) of “Research Institutes that receive basic funding through the RCN” (with responsible ministries in brackets):

1. **Environmental Institutes** (Ministry of Climate and Environment)
2. **Primary industry institutes** (Ministry of Trade, Industry and Fisheries and Ministry of Agriculture and Food)
3. **Technical industrial institutes** (Ministry of Trade, Industry and Fisheries)
4. Social Sciences institutes (Ministry of Education and Research)

In its Reviews of Innovation Policy of Norway (2017:113), the OECD states that “*Around 67% of the R&D undertaken in 2015 by the research institutes” sector has been classified as applied research, 18% as experimental development and 15% as basic research (NIFU, 2016)*”.

Research institutes from the groups 1-2-3 above can be defined as “RTOs” following the OECD 2011 definition “i.e. *research organisations, partially funded by the state, that undertake research that addresses industrial needs*”. A few Institutes from group 4 above could also be added to the list of RTOs (primarily serving industry”, as well as a few of the Research Institutes that receive state grants directly from a ministry.

4. “Official” data on the Norwegian research institute sector

A R&D statistical survey on the independent research institute sector is carried out annually by the Nordic Institute for Studies in Innovation, Research and Education (NIFU) in agreement with the Research Council of Norway. From 2022 the data collection is transferred to Statistics Norway.

The main purposes of this R&D statistical survey on the independent research institute sector is to:

1. Provide the authorities with a good knowledge base on the research institutes sector for assessing the structure of research policy – evidenced-based policy making (information reported is processed and made available at research institute level in annual reports published by the Research Council and sent to the responsible ministries)
2. Fulfil Norway’s statistical obligations towards the OECD and Eurostat,
3. Provide the key figures needed to assess whether or not a research institute should be taken in or out of the basic funding system,
4. Provide the key figures needed to calculate the performance-based portion of the public basic funding allocation for Research institutes that receive basic funding (FFA members).

In addition, using the same form inquiry for all the above-mentioned purposes enabled to reduce the respondent load.

Since the key figures are both transparent and have a direct impact on funding, the quality of the answers will be good, which also makes a positive contribution to the R&D statistics. Continuous work is being made on the guide for filling out the form. This is important since the use of the data in a funding system requires as unambiguous definitions as possible.

The data on the Research Institute sector is collected via a dedicated R&D survey, and each Research Institute unit is clearly identified as such in the national R&D statistics, even though they can then end up into different categories in the OECD statistics (since the “Research Institutes” category does not exist as such in the Frascati Manual).

The Research Council of Norway is working to harmonize the processing of research information pertaining to research institutes across countries so that data can be comparable, or at least transparent as to how the data for the research institutes are processed. **If other EU/OECD countries are able to identify Research Institutes (or RTOs) as defined statistic units, this would enable the OECD/EUROSTAT to collect data on Research Institutes (or RTOs) at OECD/EUROSTAT level** (with or without update of the Frascati manual – provided there is an alignment on the definition/criteria used).

Annex 2 - Criteria officially used at national level to define the RTO Sector

This table lists the criteria officially used at national level to define the RTO sector, including the official source of the definition/criteria in the endnote section,

	Criteria used to define RTOs at national level	Austria ⁱ	Belgium/Flanders ⁱⁱ	Canada	Denmark ⁱⁱⁱ	Finland ^{iv}	France	Germany	Italy	Lithuania ^v	Luxembourg ^{vi}	Norway ^{vii}	Poland ^{viii}	Portugal ^{ix}	Slovenia ^x	Spain ^{xi}	Sweden ^{xii}	Switzerland	The Netherlands ^{xiii}
	No official definition of RTOs at national level			X			X	X	X	X			X				X	X	X
1.	Not-for-profit: all profit re-invested in infrastructures, facilities and the creation of new knowledge				X	X				X	X		(X)	X	X	X		X	
2.	Scientifically, financially and administratively autonomous¹⁰, self-owned, impartial, independent of business & political interests (knowledge and facilities at the disposal of all businesses on equal terms, principle of academic freedom applies)									X	X	X		X	X	X			
3.	Carries out excellent applied RD&I (primary activity), building on excellent scientific research to reach advanced technological levels / possess the necessary excellent professional & scientific competencies and infrastructures in house	X	X		X					X	X	X		X	X	X		X	
4.	“Substantial” critical mass (minimal number of employees to be considered as RTO), which enables to conduct RD&I on a large-enough scale to ensure competence building		X							X		X		X	X	X			
5.	Transfers science and technology to the private sector and society: strong valorisation potential to attract new or support existing businesses to strengthen their competitiveness and innovative capacity, can include the creation of spin-offs and/or training activities		X		(X)	X				(X)	X		(X)	X		X		X	(X)
6.	Contributes to overcome market failure: builds and supports RD&I Competences ahead of market demand and in areas where the market itself cannot or does not meet the needs				(X)					X				X	X	(X)			

¹⁰ Might not apply to RTOs outside of the EU, which often have closer links to their government.

	Criteria used to define RTOs at national level	Austriaⁱ	Belgium/Flandersⁱⁱ	Canada	Denmarkⁱⁱⁱ	Finland^{iv}	France	Germany	Italy	Lithuania^v	Luxembourg^{vi}	Norway^{vii}	Poland^{viii}	Portugal^{ix}	Slovenia^x	Spain^{xi}	Sweden^{xii}	Switzerland	The Netherlands^{xiii}
7.	Public mission: conducts research that fits in the RD&I policy of the government, of interest to society at large (e.g. addressing societal challenges)		X			X				X	X	X	(X)	X	X	(X)		(X)	(X)
8.	Public/private funding model, including a possible split of public funding (depending on the national RD&I policy/strategy) between basic government funding (when available) and public competitive funding (at national and/or international level, when available), and private funding (with often a minimum share of around 15% to 25%).	(X)				X					X	X		X	X	X		X	
9.	National & international RD&I cooperation									X	X		(X)	X		X		X	
10.	Development and management of state of the art technology infrastructures, often unique in the national and even in the international context				(X)													X	(X)
11.	Objective to function on a stable financial, professional and organisational basis (often an outcome of an efficient funding model)				X									X		X			
12.	Ensures that its resources will be dedicated to the same purposes and objectives even after the end of the RTO															X			
13.	Members of the management boards are not paid through public funds for their services to manage the RTO														X	X			

ⁱ **Austria:** Very few criteria to define “research and technology organisations” and more in general “public research institutions” in the new [Austrian Research Funding Law](#) (“Forschungsfinanzierungsgesetz”) of 16 July 2020.

ⁱⁱ **Belgium/Flanders:** criteria in the law (Decree of 30/04/2009) for being considered a RTO’s in Flanders region of Belgium, i.e. the so-called “Strategische OnderzoeksCentra” (strategic research centers) or SOC.

ⁱⁱⁱ **Denmark:** Official definition to be designated and approved as GTS Institute by the Danish Ministry of Higher Education and Science (re-evaluated every 3 years)

^{iv} **Finland:** Definition of “national research institutes” from the [Finnish statistical office](#).

^v **Lithuania :** Resolution of the Government of the Republic of Lithuania [16 September 2009 No. 1170](#) and Statutes of the Center for Physical Sciences and Technology, approved by the Government of the Republic of Lithuania on [25 June 2014 No. 596](#).

^{vi} **Luxembourg** : Official definition of ‘Public Research Centres’ included in the [Law of Dec. 3rd 2014](#).

^{vii} **Norway**: Official requirements for Technology Institutes to receive public basic funding. Extra KPIs:

- Income from nationally and internationally commissioned research must comprise at least 25 per cent of total R&D revenues.
- Scholarly publication measured by publication points per researcher full-time equivalent (FTE) must correspond to at least one-third of the average for the institute’s arena.
- The institute must have at least 20 researcher FTEs.
- The income from funding contributions (e.g. from the Research Council and the EU) must comprise at least 10 per cent of total R&D revenues

^{viii} **Poland**: No official definition of RTOs in Poland. From a legal point of view, there are three types of organisations which could be classified as RTOs: research institutes (regulated by the Law of [30.04.2010](#)), institutes grouped in Łukasiewicz Research Network (regulated by the Law of [21.02.2019](#)) and private organisations like Foundations (i.e. Technology Partners Foundation). Research institutes and institutes grouped in Łukasiewicz Research Network are public research organisations responsible for R&D activities, knowledge transfer, knowledge dissemination and international cooperation in above activities.

^{ix} **Portugal** : Official definition and requirements can be found in the [RCM nº 84/2016](#) that defines the « Centros de Inovação Tecnológica – CIT » (See [ANI website](#))

^x **Slovenia** : Definition included in the Research and Development Activity Act – Act on Research and Development Activity [No. 96/02 of 14 November 2002](#) (Chapter 3), and in the Institutes Act of [07.07.2014](#) (Rules on the content and manner of keeping records on providers of research and development activities, Article 4), and finally the Decree on meeting fees and reimbursement of expenses in public funds, public agencies, public institutes and public economic institutes ([Official Gazette of the Republic of Slovenia](#), No. 16/09, 107 / 10, 66/12, 51/13 and 6/15) (Item 1, Article 2).

^{xi} **Spain**: Official definition and requirements of “Centros Tecnológicos” can be found in [RD 2093/2008](#), which creates a Spanish Registry of RTOs. It also defines a preliminary category (Centros de Apoyo a la Innovación Tecnológica) for those organisations not strong enough to be considered as official RTOs. The specific criteria mentioned in this table can be found in several articles of our official definition:

- Crit 1: Article 2 and Article 5.1.c)
- Crit 2: Articles 5.1.e, 5.1.f
- Crit 3: Articles 5.1.d, 5.2.c
- Crit 4: Articles 5.1.e, 5.2.a
- Crit 5: Article 2 and Articles 5.1.j, 5.2.d, 5.2.e. Furthermore, we have proposed to mention also training activities as part of this transfer of knowledge to society
- Crit 6 and 7: although there are not official criteria to define the RTOs, they are considered part of the nature of the RTO and are promoted by the public administrations through

different public funded activities

- Crit 8: Articles 5.2.b, 5.2.c, 5.2.d
- Crit 9: Article 2 includes the need of cooperation
- Crit 11: Article 5.1.e
- Crit 12 and 13: Articles 5.1.h and 5.1.i

^{xii} **Switzerland**: No official categorisation of an RTO in Switzerland. CSEM falls under Art.15 of the Federal Act on the Promotion of Research and Innovation (RIPA), paragraph 3c “Centres of Technological Excellence”. The points selected in the above table reflect CSEM’s position and role, they do not necessarily apply to other RTOs in Switzerland.

^{xiii} **The Netherlands**: No official categorisation of RTOs in the Netherlands. Data on financing and expenditure of public research institutes is published by the Rathenau Institute. They refer to a category called “Organizations of Applied Research” (TO2), which would represent RTOs in the Netherlands. There is no definition of what is a TO2 Organisation; they are mainly labelled as such (i.e. defined by law via Letter to Parliament which describe three ‘main objectives’ for RTOs):

- Develop, apply and disseminate knowledge for the benefit of addressing societal questions and support of public tasks and policy. Part of this research is conducted within the framework of legal tasks . requirements.
- Develop, apply and disseminate knowledge for the benefit of strengthening the innovative capacity and competitiveness of the Netherlands, and especially Top sectors.
- Manage and run strategic research facilities which are unique for the Netherlands, and also in an international context.