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EXECUTIVE SUMMARY

This deliverable aims at providing preliminary recommendations for the mobilisation of National Public Research resources in EU13 Member States for the execution of the identified SET Plan Implementation Plans (IPs) needs.

This purpose stems from the fact that the research and innovation gap in Europe remains a pressing challenge, especially in consideration of the 2030 and 2050 climate goals. EU13 countries have low, or even inexistent, participation rates in the realisation of the SET Plan Implementation Plans, their national research organisations have limited awareness of the Clean Energy Transition (CET) priorities, funding schemes and initiatives and have received only a marginal contribution of Horizon 2020's budget.

This report summarises the actions SUPEERA has carried out to widen the activity of those countries towards the SET Plan by facilitating the mobilisation of their relevant national stakeholders. These actions include: identifying and mapping non-EERA stakeholders (national research organisations and national bodies in charge of public institutional and competitive funding) within EU13 countries, enhance their engagement towards EERA activities and the SET Plan through the organisation of webinars and online events and sharing best practices between non-EERA EU13 stakeholders and key EERA members with the ambition of facilitating the development of long-lasting interactions.

Although the original formulation of the deliverable required a series of physical workshops in selected EU13 countries to be organised, the Covid-19 pandemic hindered the originally established execution of this subtask. Therefore, different activities were arranged for the first reporting period, namely, in-depth desk research of EU13 involvement in the SET Plan and the organisation of a series of two webinars to discuss reasons of lower participation of the EU13 Member States in funding schemes; the state of play of the SET Plan as a platform contributing to the realisation of the Clean Energy Transition and the role of the EERA network; analysis of the performance of EU13 countries in the Horizon 2020 Framework Programme based on three assumptions and related indicators.

LIST OF ACRONYMS

AC(s)	Associated County(ies)
CET	Clean Energy Transition
CCS	Carbon Capture and Storage
CCU	Carbon Capture Utilisation
CSA	Coordination and Support Actions
EC	European Commission
EERA	European Energy Research Alliance
ERA	European Research Area
ETIP(s)	European Technology and Innovation Platform(s)
EU	European Union
FP	Framework Programme
FTE	Full-time equivalent
GERD	General Expenditures on Research and Development
IP(s)	Implementation Plans
IWG(s)	Implementation Working Group(s)
NCP(s)	National Contact Point(s)
R&D	Research and Development
R&I	Research and Innovation
RTO(s)	Research and Technology Organisation(s)
SC3	Societal Challenges 3 - Secure, Clean and efficient energy
SETIS	Strategic Energy Technology Information System
SUPEERA	SUPport to the coordination of national research and innovation programmes in areas of activities of the European Energy Research Alliance
WP(s)	Work Package(s)

LIST OF TABLES AND CHARTS

I INTRODUCTION

On January 1st, 2020, the SUPEERA project[1] – SUPport to the coordination of national research and innovation programmes in areas of activities of the European Energy Research Alliance – was launched.

The project aims at reaching four high-level objectives:

1. Facilitate the coordination of the research community in support to the execution of the SET Plan towards the Clean Energy Transition (CET);
2. Accelerating innovation and uptake by industry;
3. Provide recommendations on Research and Innovation (R&I) priorities and policy frameworks through the development and analysis of energy and macroeconomic indicators;
4. Support and promote the connection of the SET Plan and the CET with all stakeholders.

To achieve the first objective, the SUPEERA project foresees, on one side, a detailed understanding of the status and needs of R&I activities of the SET Plan Implementation Plans (IPs) and, on another side, to spread excellence and widen participation in the SET Plan across Europe by fostering a stronger engagement of the Member States that joined the EU after 2004, the so-called EU13 countries. These countries, which have rather limited participation rates in the realisation of the SET Plan through its IPs, are mainly eastern countries (Poland, Slovakia, Czech Republic, Hungary, Romania and Bulgaria), the Baltic states (Estonia, Latvia, Lithuania), and south and south-eastern countries (Malta, Slovenia, Croatia and Cyprus).

To pursue this objective, SUPEERA has also launched, within the WP4, a digital campaign called “Meet the EU13” consisting of one success story for each of the 13 Member States showcasing the scientific landscape, major players, networks, infrastructure, expertise, and current engagement in the SET Plan of the selected countries.

The current deliverable belongs to the Task 1.4 Widening. Recommendations for mobilisation of National Public Research resources in EU13, which encompasses the following actions:

1. The identification and mapping of (potential) resources from Research and Technology Organisations (RTOs), universities, and relevant national funding bodies responsible for energy R&I within EU13 countries;
2. The engagement of the aforementioned non-EERA stakeholders towards EERA activities and the SET Plan;

[1]SUPEERA Website: https://www.supeera.eu.

3. Sharing best practices between non-EERA EU13 stakeholders and key EERA members that will lead to the creation of networks and increased participation in EU-funded R&I projects.

II SETTING THE SCENE AND METHODOLOGY

2.1 Introduction

The R&I gap in the European Union remains a pressing challenge. The group of the EU13 countries have a low, or even inexistent, participation in the SET Plan and underperforms in the European Research and Innovation Framework Programmes (FPs) compared to the Member States that had joined the EU before 2004 – the so-called EU15 countries.[2]

Although most EU13 countries are reported to participate, at least formally, in some of the SET Plan Implementation Plans and the related Implementation Working Groups (IWGs), their involvement has been rather limited and inconsistent over time.

This R&I gap is also reflected in an unequal participation in the EU Framework Programme for Research and Technological Development of the Horizon 2020 (FP8); the latter representing the most substantial EU instrument to support and foster cooperation among Member States in R&I and develop the European Research Area (ERA) as a "single, borderless market for research, innovation and technology across the EU."[3] In the seven years of FP8 operation, the new members have received only a marginal contribution of its budget.

It is imperative to bridge the R&I gap between these two clusters of countries not only to ensure that the CET and underlying policies and strategies will unfold in an even way throughout the whole European Union but also because the group of the EU-13 represent an untapped opportunity for growth and development of their national economies and of the EU as a whole.

The aim of this report is to identify and analyse the reasons for the lower performance of EU13 in R&I within the European Union context to widen the activity of such countries towards the SET Plan by identifying and facilitating the mobilisation of key research organisations and national funding bodies relevant for the realisation of the identified SET Plan IPs needs. Moreover, this report investigates EU13's limited participation in the European Framework Programme Horizon

[2] Julien Ravet, *From Horizon 2020 to Horizon Europe #2.1 Dynamic Network Analysis* (European Commission, Nov. 2018),https://ec.europa.eu/info/sites/default/files/research_and_innovation/knowledge_publications_tools_and_data/documents/h2020_monitoring_flash_112018.pdf.

[3] Michal Pazour, Vladimir Albrecht et al., *Overcoming innovation gaps in the EU13 Member States* (European Parliament, Mar. 2018), 11, https://www.europarl.europa.eu/RegData/etudes/STUD/2018/614537/EPRS_STU(2018)614537_EN.pdf.

2020 to identify ways to improve their future performance and ensure a successful involvement in Horizon Europe. The engagement of non-EERA stakeholders will be pivotal to raise awareness of the SET Plan and CET goals and emerging funding opportunities for project proposals towards Horizon Europe and to share best practices between non-EERA EU13 stakeholders and key EERA members. Based on the findings on the key factors hindering the participation of EU13 countries, initial recommendations and policy options will be developed. This report will be updated in Y2 and realised in its final version at the end of the project.

The report is structured in 5 chapters. While chapter 1 gives a series of introductory remarks, chapter 2 proceeds with the description of the methodology slightly modified by the amendment due to the Covid-19 pandemic. Chapter 3 sets out a more detailed analysis of the R&I gap between EU13 and EU15 countries. Chapter 4 provides a separate analysis for each of the EU13 countries in relation to their involvement in the SET Plan, their performance in Horizon 2020 examined through a set of three assumptions and relevant indicators combined with the main reasons for lower participation as expressed by EU13's National Contact Points during the SUPEERA webinar host on 1st June 2021. The chapter concludes with a list of relevant RTOs. Chapter 5 describes the activities EERA has already carried out to widen the participation of EU13 MSs in the SET Plan, and, finally, chapter 6 offers a first set of preliminary recommendations and policy options to bridge the R&I gap.

2.1 Method of analysis and adaptation of the initial planning

The deliverable partially differs from what planned initially due to the general lockdown imposed to contain the Covid-19 pandemic, which impacted some of the actives foreseen under Task 1.4. As a result, it has not been possible to organise several of the physical workshops in selected EU13 countries so far foreseen for Y1. Instead, for the first reporting period, a set of different activities has been arranged. Namely, an in-depth desk research has been carried out to assess the actual involvement of EU13 in the SET Plan's Implementation Plans and their performance in the Horizon 2020 Framework Programme, alongside the identification and mapping of respective RTOs participating in Horizon 2020 projects.

While waiting for the Covid-19 pandemic to allow the organization of physical workshops, the required information have been retrieved from the two webinars organised with relevant stakeholders from EU13. Such webinars were meant to discuss the reasons for EU13 lower participation in EU-funded schemes, spread awareness about the SET Plan as a platform contributing to the realisation of the Clean Energy Transition and the role of the EERA network.

Since the project activity also covers national structures giving support to research organizations related funding schemes (public institutional and competitive funding, administrative procedures,

training, etc.), one webinar was specifically dedicated to the National Contact Points (NCPs) in EU13. These online events have allowed to strengthen ties with NCPs and gain preliminary information about the planned activities that these countries will carry out in relation to Horizon Europe.

III THE R&I GAP BETWEEN EU13 AND EU15 COUNTRIES

3.1 The gap in relation to the SET Plan

Most EU13 countries have a very limited participation in the realization of the SET Plan through the execution of its Implementation Plans. Although some of them officially take part to selected Implementation Working Groups, their actual involvement is rather limited, often they do not allocate national funding to any IPs and they information they provide on how the SET Plan may contribute to achieve the national energy and climate objectives are uncompleted and unsatisfactory. Such conclusions are particularly evident in the assessments of the National Energy and Climate Plans (NECPs) of the new members carried out by the European Commission (EC).

Sometimes it is not even possible to assess with certainty to which IPs and IWGs EU13 countries belong. There is a discrepancy between the information provided in the only publication from the Strategic Energy Technology Information System (SETIS) covering in detail EU MSs involvement in SET Plan IPs, the *SET Plan delivering results (2018)*,[4] and any other sources, such as the aforementioned NECPs and the related EC's assessments (for a complete list of the sources consulted see the introduction to Chapter 4).

To overcome this doubt and assess EU13 involvement to the SET Plan, this analysis relies on the most updated information released from SETIS about the EU Members formal involvement in specific IWGs. This information is summarised in the two tables 3.1.1 and 3.1.2 here below.[5] Nonetheless, for the sake of completeness, the SETIS map outlying Member States involvement in Implementation Plans is also provided (see Figure 3.1.1).

[4] *SET Plan delivering results (2018)* (SETIS Jan. 2019), https://setis.ec.europa.eu/set-plan-delivering-results-2018_en.
[5] This information can be retrieved from the SETIS website's section *Implementing the actions*: https://setis.ec.europa.eu/implementing-actions_en.

Country	Batteries	CCU-CCS	CSP-STE	Deep Geothermal	Energy Efficiency in Buildings	Energy Efficiency in Industry
Bulgaria						
Croatia	X					
Cyprus			X	X		X
Czechia	X	X				X
Estonia	X					
Hungary	X	X				
Latvia	X				X	X
Lithuania	X					
Malta	X					
Poland	X					X
Romania	X					
Slovakia	X					X
Slovenia	X					X

Table 3.1.1 – EU13 participation to SET Plan Implementation Working Groups (1)

Country	Energy system	Nuclear safety	Ocean energy	Offshore wind	Photovoltaics	Positive energy districts	Renewable fuels and bioenergy
Bulgaria							
Croatia		X					
Cyprus	X				X	X	
Czechia		X				X	
Estonia							
Hungary		X					
Latvia	X					X	
Lithuania		X					
Malta							
Poland		X				X	
Romania		X				X	
Slovakia							
Slovenia		X					

Table 3.1.2 – EU13 participation to SET Plan Implementation Working Groups (2)

As indicated in the above tables, most EU13 countries are somehow involved in the SET Plan – Bulgaria being the only exception, not participating in any Implementation Working Groups. EU13 countries participation is mostly visible in nuclear safety, batteries, energy efficiency in industry and positive energy districts. Among the EU13 countries Cyprus is the most active country and

participates in various IPS Such as CSP-STE, deep geothermal, energy efficiency in industry, energy system, photovoltaics, and positive energy districts.

SET Plan Implementation Plans by country

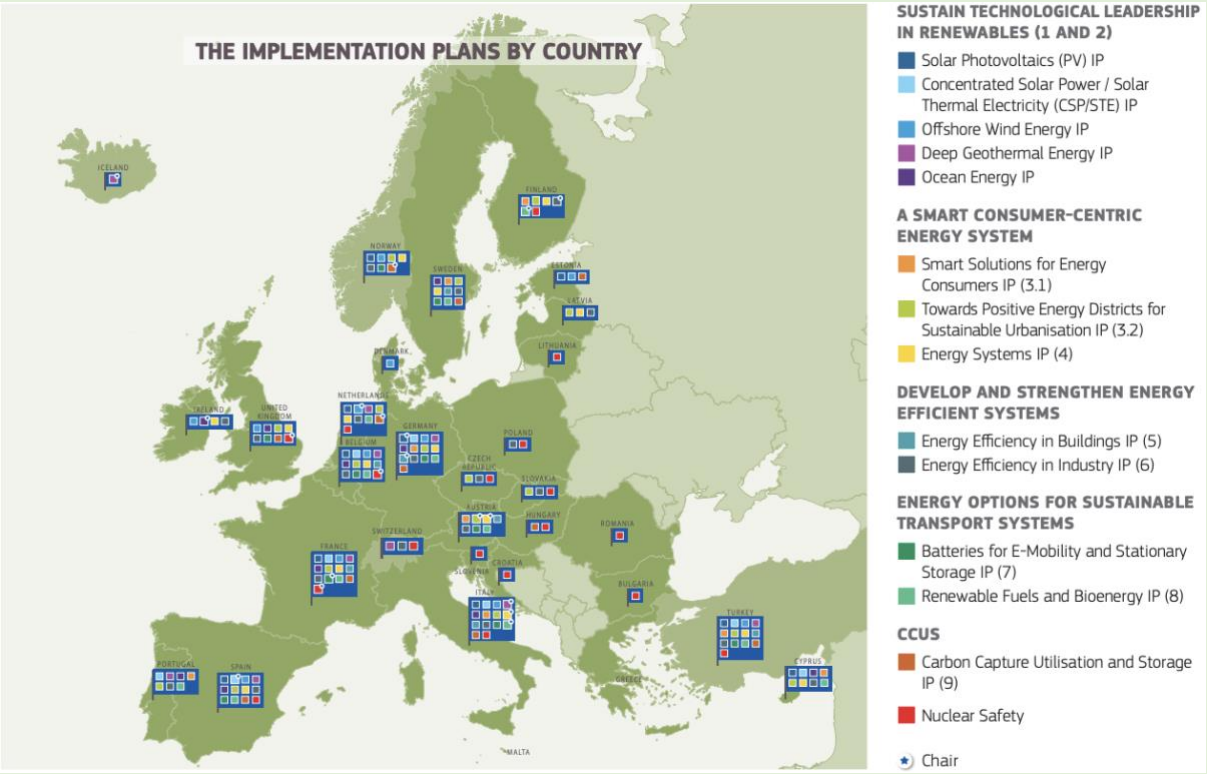

Figure 3.1.1 – Map of the SET Plan Implementation Plans by country as of 2019. [6]

3.2 The gap in relation to the Horizon 2020 Framework Programme

The R&I gap within the two clusters of EU Member States is especially evident in relation to the contribution received from the Horizon 2020 Framework Programme. As a matter of fact, even if EU13 Member States account for roughly the 20 percent of the EU population, less than 5% of the total budget of the Horizon 2020 has been allocated to research teams based in these

[6] *SET Plan infographics* (SETIS, 2019), https://setis.ec.europa.eu/publications/integrated-set-plan-infographics.

countries, while more than 95% of financed projects were based in EU15 countries – with Germany, the UK and France being the primary recipient.[7]

Goeographical distribution of Horizon 2020 net contribution

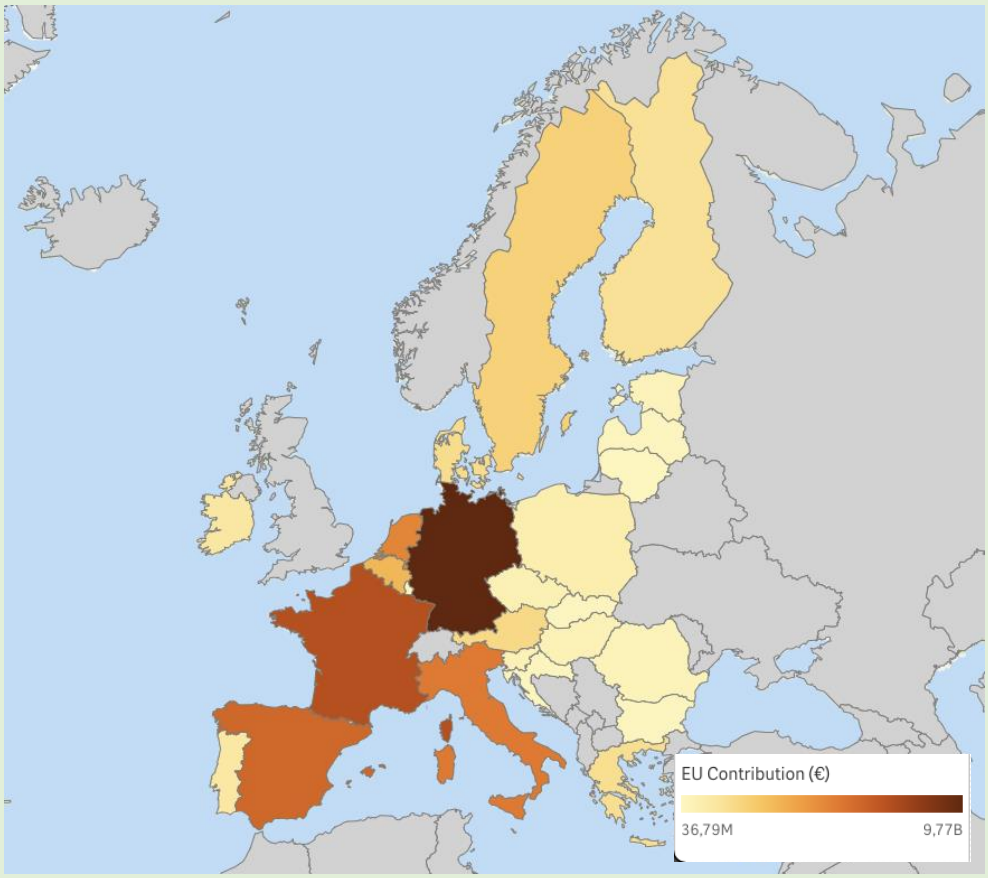

Figure 3.2.1 – Geographical distribution of net Horizon 2020 budget by country. [8]

[7] Michal Pazour, *Horizon 2020: Geographical balance of beneficiaries, Performance gap between EU13 and EU15 Member States* (European Parliament, Dec. 2020), https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/662597/IPOL_BRI(2020)662597_EN.pdf.

[8] Image source: *Horizon 2020 dashboard* (European Commission, 2021), https://webgate.ec.europa.eu/dashboard/sense/app/93297a69-09fd-4ef5-889f-b83c4e21d33e/sheet/a879124b-bfc3-493f-93a9-34f0e7fba124/state/analysis.

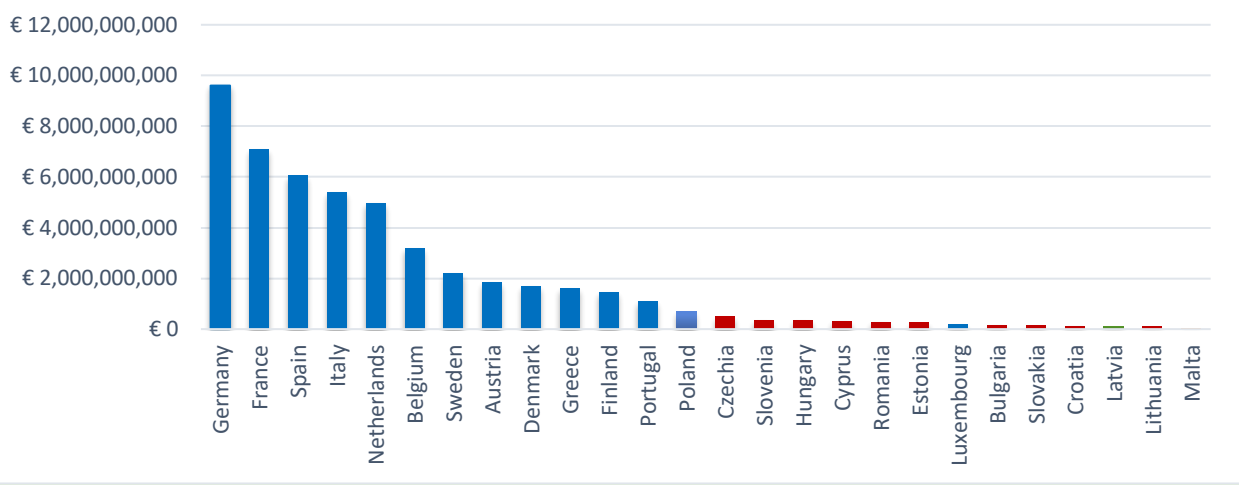

Table 3.2.1 – Horizon 2020 net EU contributions (mil. EUR).[9]

This outcome is a consequence of the combination of specific R&I systems in considered countries – and explained in detail in the Chapter 4 of this report, and of the inherent nature of the FPs, whose purpose is to support and attract the best research teams, remove barriers to innovation, and foster cooperation between public and private sectors in delivering innovation. To achieve these goals, research needs to be of excellent quality, produced in international collaboration and selected through competitive criteria. It follows that the allocation of funds cannot be based on the principle of the *juste retour*. Conversely, the intrinsic pursuit of excellence inevitably leads to variable levels of participation across the EU and uneven geographical budget distribution.[10]

The participation of most the EU13 countries in the EU Framework Programmes traces back to before their accession of 2004, when they were allowed to take part to the FP5 (1998-2002) through specific association agreements. Nevertheless, despite two decades of experience with

[9] Data source: *Horizon 2020 country profile database* (European Commission, 2021), https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/0c8af38b-b73c-4da2-ba41-73ea34ab7ac4/state/0.

[10] Gianluca Quaglio, Sophie Millar,et al., *Exploring the performance gap in EU Framework Programmes between EU13 and EU15 Member States* (European Parliament, Jun. 2020), 1, https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/641542/EPRS_IDA(2020)641542_EN.pdf.

FPs funding, the evidence shows that EU13 still lags behind EU15 in terms of participation and success rate in FPs and that this gap has not significantly decreased over time.

It is important to stress that the EU13 is far from being a homogeneous group of countries – and neither is the group of the EU15. Although the division of EU Member States into these two clusters based on their R&I performances may be useful, such a dichotomy leads to an oversimplification of reality. Some EU13 MSs have a very limited R&D intensity with a gross expenditure on research and development (GERD) less than 1% of gross domestic product, while some others have considerably increased their R&I intensity to levels even higher than those of some EU15 countries.[11] From a more general point of view, EU13 countries differ in terms of geography, economic development, general R&I efforts, research expenditure, areas of scientific excellence, degrees of internationalisation and number of researchers, and the types of institutions responsible for developing science policy.[12]

Horizon 2020 net EU contributions for EU13

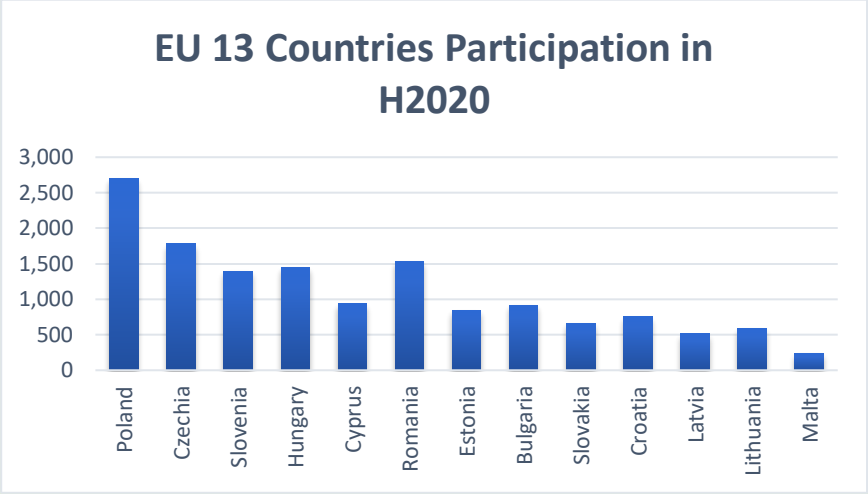

Table 3.2.2 – Horizon 2020 net EU contributions for EU13 only (mil. EUR). [13]

[11] Pazour, Albrecht et al., *Overcoming innovation gaps in the EU13 Member States* (European Parliament, Mar. 2018), 11, https://www.europarl.europa.eu/RegData/etudes/STUD/2018/614537/EPRS_STU(2018)614537_EN.pdf.
[12] Quaglio, Millar,et al., *Exploring the performance gap in EU Framework Programmes between EU13 and EU15 Member States* (European Parliament, Jun. 2020), 1, https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/641542/EPRS_IDA(2020)641542_EN.pdf.
[13] Data source: *Horizon 2020 country profile database* (European Commission, 2021), https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/0c8af38b-b73c-4da2-ba41-73ea34ab7ac4/state/0.

IV COUNTRY ANALYSIS

4.1 Introduction

This chapter examines each of the EU13 countries in detail in relation to their involvement in the SET Plan, their performance in Horizon 2020 and their relevant stakeholders. This latter section includes a breakdown of how Horizon 2020 net funding is divided across sectors and main organisations as well as a list of relevant RTOs participating in Societal Challenges 3 - Secure, clean and efficient energy (SC3) projects.

Data on relevant RTOs have been retrieved from the *Cordis database* (European Commission, 2021) during May 2021.[14] For the purpose of this analysis, the term RTOs refers to research and education sectors grouped together.

A final section lists the details for the lower performance in Horizon 2020 as they were provided by the National Contact Points during the webinar of the 1st June 2021, "SUPEERA Webinar for EU13 – Strengthening your participation in EU Clean Energy Transition", where, during a *tour de table,* representatives of the EU13's NCPs were invited to showcase the three main reasons that, in their opinion, account for this lower level of participation of their respective country.

To collect information on EU13's involvement in the SET Plan, a desk research was carried based on the following sources:

- SET Plan implementation progress reports;
- Thematic reports issued from the SET Plan Information System (SETIS);
- Thematic publications from the European Technology and Innovation Platform (ETIP).
- SET Plan reports issued from the Joint Research Centre (JRC);
- Websites of EU13 relevant public and private stakeholders (e.g. Ministry of Energy and Environment, Ministry of Education, Ministry of Science and Technology, Ministry of Economy, National Agencies for R&I, etc.);
- Community Research and Development Information Service (CORDIS) database;
- National Horizon Europe portals and National Contact Points (NCPs) websites and social media;
- EU13 National energy and climate plans (NECPs);
- European Commission's assessment of the EU13 NECPs;

[14] *Cordis database* (European Commission, 2021), https://cordis.europa.eu/search?q=contenttype%3D%27project%27%20AND%20programme%2Fcode%3D%27H2020-EU.3.3.%27&p=1&num=10&srt=/project/contentUpdateDate:decreasing.

The performance of EU13 countries in the Framework Programme Horizon 2020 is tested against three assumptions, that is to say:

1. Relative weakness of the R&I systems of the EU13 compared to the EU15;
2. Relative lack of scientific excellence in institutions from the EU13 compared to the EU15;
3. Relative lower quality of proposals involving EU13 participants compared to those that do not involve them.[15]

However, as it is evident from the analysis, these assumptions are not separated but interdependent on each other, and their relative importance varies across countries. Moreover, they are confirmed only for some EU13 countries and hence are not applicable to all of them.

Each assumption is examined using different indicators to evaluate the performance of the country vis-à-vis EU average or cumulative values for the whole EU and EU13 and EU15 clusters.[16]

All data used in the Horizon 2020 performance analysis are generated from the same source, i.e., the *Horizon 2020 database* made available by the European Commission and consulted in the period from 15th June to 30th June.[17] This data are listed in the following tables for each of the analysed country:

- 1st assumption: relative weakness of the R&I systems of EU13 vs EU15
- 2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15
- 3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not
- H2020 performance
- H2020 retained proposals

The assessment of the first assumption "Relative weakness of the R&I systems of the EU13 compared to the EU15" is based on the following indicators:

- **Total and private R&D Intensity**, i.e., General Expenditures on Research and Development (GERD);

[15] This methodology is, in part, inspired from the paper providing the most comprehensive analysis on the topic; *Exploring the performance gap in EU Framework Programmes between EU13 and EU15 Member States* by Quaglio, Millar,et al. (European Parliament, Jun. 2020), https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/641542/EPRS_IDA(2020)641542_EN.pdf.
[16] In this analysis United Kingdom is considered as part of the EU, because it was so for most of the period covered by the Framework Programme Horizon 2020 (2014-2020).
[17] *Horizon 2020 database* (European Commission, 2021), https://webgate.ec.europa.eu/dashboard/hub/stream/aaec8d41-5201-43ab-809f-3063750dfafd.

- **Knowledge-intensive employment**, that is to say the percentage of employment in Knowledge Intensive activities;
- **Innovation performance** of the country based on the European Innovation Scoreboard, which scores countries' level of innovation based on the relative strength and weaknesses of national innovation systems. The four levels of innovation from the lower to the higher are: emerging innovator, moderate innovator, strong innovator, and innovation leader.[18]

The evaluation of the second assumption "Relative lack of scientific excellence in institutions from the EU13 compared to the EU15" is carried out through these indicators:

- **Top-cited publications rate**, i.e., the percentage of scientific publications within the 10% most cited scientific publications worldwide;
- **Researchers ratio ranking**: position of the MS in the EU ranking based on its relative performance in relation to the indicator for Full-time equivalent (FTE) Researchers per million of population.

To assess the third assumption "Relative lower quality of proposals involving EU13 participants compared to those that do not involve them", this study relies on the following:

- **Eligible proposals**, that is the number of proposals that have not failed at the eligibility or admissibility step. Both the percentage of EU total and the total number of eligible proposals are considered.

To determine the performance of EU13 MSs in relation to Horizon 2020, the following indicators are employed:

- **H2020 signed grants**: number of grant agreements signed, including "suspended", "terminated" and "closed" grant agreements. Both absolute and relative values are provided;
- **Organisations involved in H2020 projects**: the act of involvement of a legal entity in a grant agreement. A single participant can be involved in N grant agreements and therefore being counted as N participations. Both absolute and relative values are provided.
- **H2020 Net EU contribution**: funding received by the project's participants after deduction of their linked third parties' funding. Both absolute and relative values are provided.

Lastly, data on **Horizon 2020 retained proposals** is given and split across total proposals retained, those related with Horizon 2020 Social Challenges 3 (Secure, Clean and efficient energy), with Marie Skłodowska-Curie Actions and with European Research Council.

[18] *European innovation scoreboard* (European Commission), https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en.

4.2 Individual country analysis

Bulgaria

Bulgaria does not belong to any IWGs.

The Bulgarian National Energy and Climate Plan mentions cooperation with the SET Plan only to a limited extent. The document states that "the Bulgarian government will focus on the implementation of projects for the deployment of innovations in energy sector in line with the SET Plan". Moreover, it declares that "to promote the cost-effective development of low-carbon technologies in Bulgaria, the government will also rely on the SET Plan developed at EU level, which promotes cross-sector co-operation on innovation."[19]

On the other hand, the European Commission (EC) assessment of the NECP claims that the document does not commit Bulgaria to any specific plan for implementation; it provides neither a description of how activities are to be allocated under the specific implementation plans nor an explanation of how the SET plan will help Bulgaria meet its national energy and climate objectives.[20]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Bulgaria	0,75%	0,53%	26,9%	Modest innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Bulgaria	3,60%	23 out of 28 EU MSs
EU average	11,11%	

[19] *Integrated Energy and Climate Plan of the Republic of Bulgaria 2021–2030*, (Republic of Bulgaria, Ministry of Energy, Ministry of the Environment and Water), 164-165, https://ec.europa.eu/energy/sites/default/files/documents/bg_final_necp_main_en.pdf.

[20] *Assessment of the final national energy and climate plan of Bulgaria* (European Commission, Oct. 2020), https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_bulgaria_en.pdf.

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Bulgaria	2,00%	5.183
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Bulgaria	636	1,98%	955	0,63%	€ 154	0,26%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
576	99	42	53

Figure 4.2. Bulgaria.1 – Horizon 2020 performance analysis.

As far as the first assumption is concerned, Bulgaria has lower scores than the EU averages for all indicators here analysed but Private R&D intensity (0,53% vs the EU average of 0,40%). The country is labelled modest innovator based on the European Innovation Scoreboard. Referring to the second assumption, Bulgaria has a top-cited publication rate well below the EU average (3,60% vs 11,11%). It ranks 23rd out of 28 UE Member States in terms of Researchers ratio (i.e., Researchers per Thousand Employment). Concerning the third assumption, the total number of eligible proposals (i.e., those that have not failed at the eligibility or admissibility step) is 5.183 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

This relatively little outcome is reflected in a low H2020 performance: Bulgaria has signed only 636 Horizon 2020 grant agreements (1,98% of EU total) out of 6.229 approved at EU13 level

(19,43% of EU total) and 32.064 at the level of the whole EU. There are 955 Bulgarian organisations involved in Horizon 2020 projects (0,63% of EU total), while the same indicator for the entire EU13 and EU15 clusters are, respectively, 14.640 (9,65%) and 137.078 (90,35%). Finally, the net contribution received from the grant accounts to EUR 154 million (0,26% of the total amount of FP8) vs an aggregate value of EUR 3 470 million (5,82%) for the EU13 cluster and EUR 56 120 million (94,18%) for the EU15 cluster.

It is evident in this case how the three assumptions are not separated but interdependent on one another.

Relevant stakeholders

Among the relevant public authorities is the newly established **State Agency for Research and Innovation**, which has been created to boost the Bulgarian R&I efforts and will take over functions and responsibilities of the Ministry of Economy and the Ministry of Education and Science. According to the Recovery and Resilience Plan published in October 2020, the Agency is expected to coordinate and complement investments under European and national instruments.[21]

The **Ministry of Education and Science**[22] is the national institution in charge of Horizon Europe and **Horizon 2020** is the Bulgarian Horizon Europe's portal. [23]

[21] *Bulgaria Recovery and Resilience Plan* (Bulgarian Ministry of Education and Science, Oct. 2020), https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiN8Oi99frvAhWt_7sIHUIcAekQFjAAegQIBBAD&url=https%3A%2F%2Fnextgeneration.bg%2Fupload%2F36%2FBulgaria_Recovery_and_Resilience_Plan_ENG.pdf&usg=AOvVaw37IPWeoGNXspDi94XFhRkE.

[22] *Bulgarian Ministry of Education and Science*, https://www.mon.bg/.

[23] *Horizon 2020.bg*, http://horizon2020.mon.bg/page/-.

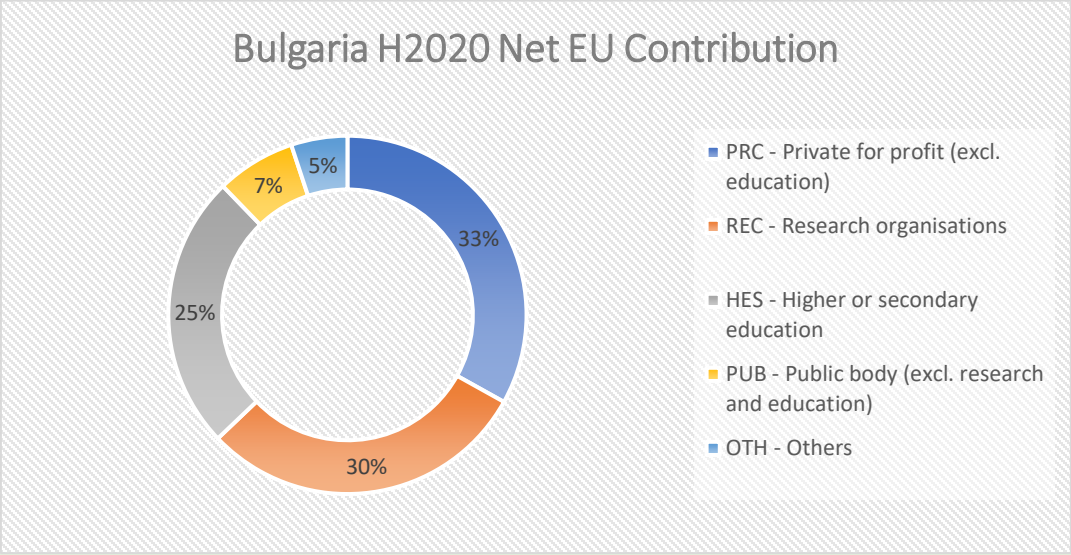

Figure 4.2. Bulgaria.2 – Types of organisations based on net EU contributions.

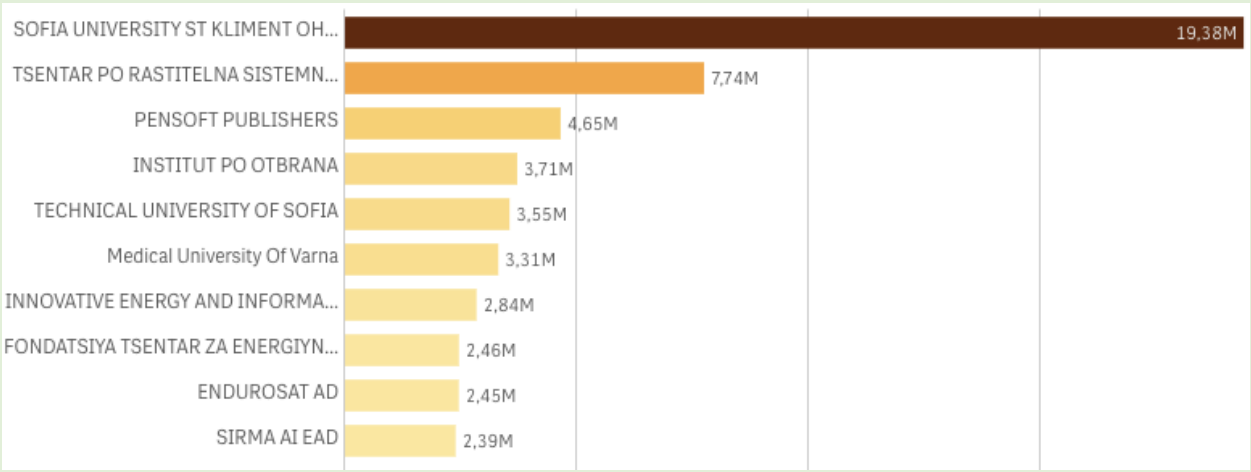

Figure 4.2. Bulgaria.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

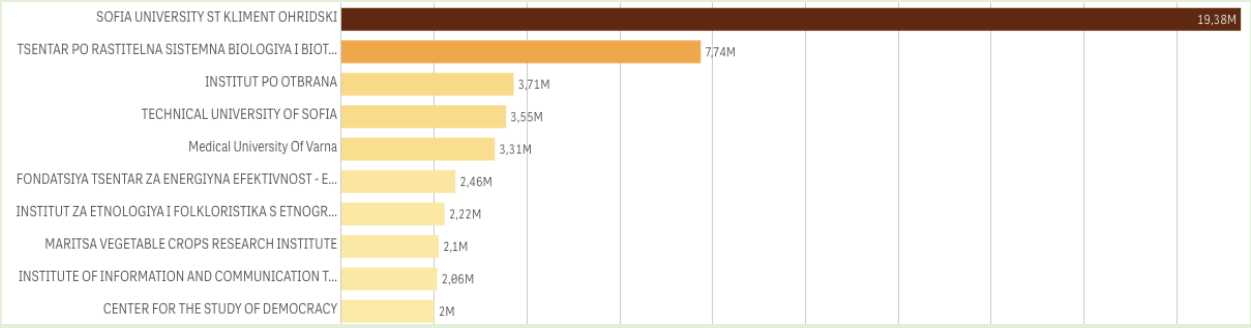

Figure 4.2. Bulgaria.4 –Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

The research and education sectors receive respectively, 30% and 25% of net H2020 budget. The most significant share of funding (33%) goes to private organisations for profit. The biggest single recipient is the education organisation, **Sofia University St Kliment Ohridski**,[24] followed by the research organisation, **Tsentar Po Rastitelna Sistemna Biologiya I Biotehnogiya**. Overall, within the first ten recipients by share of H2020 received there are 6 RTOs.

Finally, in respect to EERA main activities, the table here below lists relevant Bulgarian RTOs together with the number of Horizon 2020, Societal Challenges 3 - Secure, Clean and efficient energy projects they participated in (as per May 2021).

RTO	Number of SC3 projects
Energy Efficiency Center – Eneffect Foundation http://www.eneffect.bg/	14
Black Sea Energy Research https://www.bserc.eu/	9
Energy Agency of Plovdiv Association https://www.eap-save.eu/	6

Figure 4.2. Bulgaria.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

During the webinar organised for NCPs, Bulgaria's National Contact Points representatives did not provide any reasons for Bulgaria lower participation in Horizon 2020.

[24] *Sofia University St Kliment Ohridski*, https://www.uni-sofia.bg/eng.

Croatia

Croatia participates in the IWGs on Batteries and Nuclear Safety.

The Croatian National Energy and Climate Plan states that the connection between SET Plan activities at European and national levels will be ensured through capacity building foreseen under the "Measure IIK-6 – Capacity building for stimulating research and innovation and increasing competitiveness in the low carbon economy". The NECP lists all the relevant national stakeholders involved in the implementation and monitoring activities related with this measure.[25]

According to the European Commission's assessment of the Croatian NECP, the national plan identifies some alignments between the SET Plan and the national energy R&I objectives. Nonetheless, the NECP does not allocate national funds or identify specific activities and does not trace any links between the energy and technology plan and the national energy and climate objectives.[26]

During the widening session part of the Summer Strategy Meeting 2020, Croatia maintained that the limited participation to the SET Plan may be due to the "lack of institutional interest in actively participating in EU policies".

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Croatia	0,86%	0,42%	32,0%	Modest Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Croatia	4,2%	24 out of 28 EU MSs
EU average	11,11%	

[25] *Integrated National Energy and Climate Plan for the Republic of Croatia* (Ministry of Environment and Energy, Dec. 2019), 173, https://ec.europa.eu/energy/sites/default/files/documents/hr_final_necp_main_en.pdf.
[26] *Assessment of the final national energy and climate plan of Croatia* (European Commission, Oct. 2020), https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_croatia_en.pdf.

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Croatia	1,43%	3.696
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Croatia	561	1,75%	770	0,51%	€ 128	0,22%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
512	97	38	32

Tables 4.2. Croatia.1 – Horizon 2020 performance analysis.

In the first assumption Croatia has lower values for all the indicators apart from the private R&D intensity (0,42%) which is slightly higher than the EU average (0,40%). Croatia is is considered modest innovator in the European Innovation Scoreboard. Referring to the second assumption, Croatia has a top cited publication rate of 4,2% which is more than two times lower than the EU average 11,11% and is ranked 24 out of 28 UE Member States in terms of Researchers ratio (i.e., Researchers per Thousand Employment). Concerning the third assumption, the total number of eligible proposals for Croatia is 3.696 which is relatively low among the EU13 countries.

Croatia signed 561 Horizon 2020 grant agreement (1,75% of EU total) out of 6.229 approved at EU13 level (19,43% of EU total). In general, 770 Croatian organizations participate in Horizon 2020 projects. Croatia receive EUR 128 million (0.22% of the total amount of FP8) which is the fourth lowest amount among the EU13 countries.

Relevant stakeholders

Obzor Europa[27] is the Croatian Horizon Europe portal, while the **Agency for Mobility and EU Programmes**[28] is the national body in charge of providing information and advice on the Horizon 2020 programme.

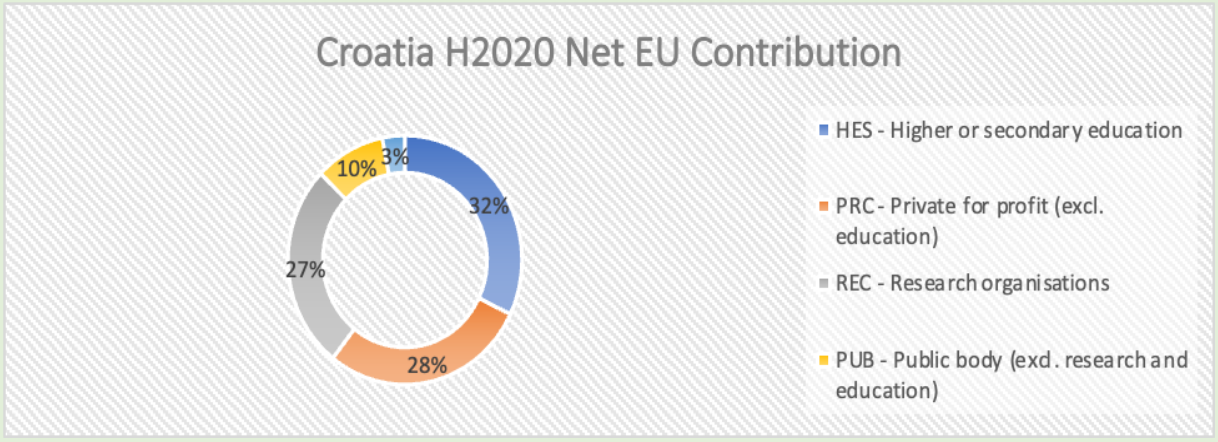

Figure 4.2. Croatia.2 – Types of organisations based on net EU contributions.

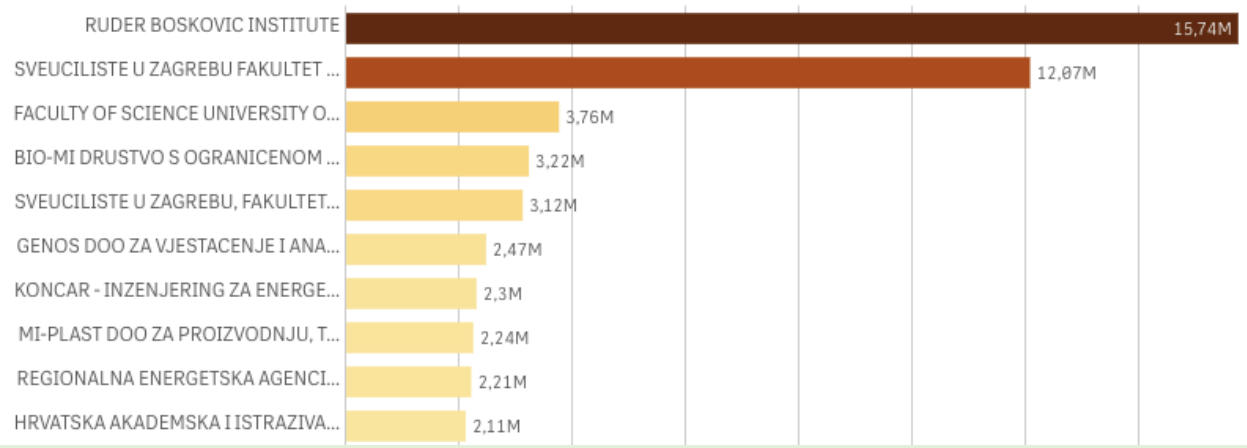

Figure 4.2.Croatia.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

[27] *Obzor Europa*, https://www.obzoreuropa.hr/.
[28] *Agency for Mobility and EU Programmes*, https://www.mobilnost.hr/hr/.

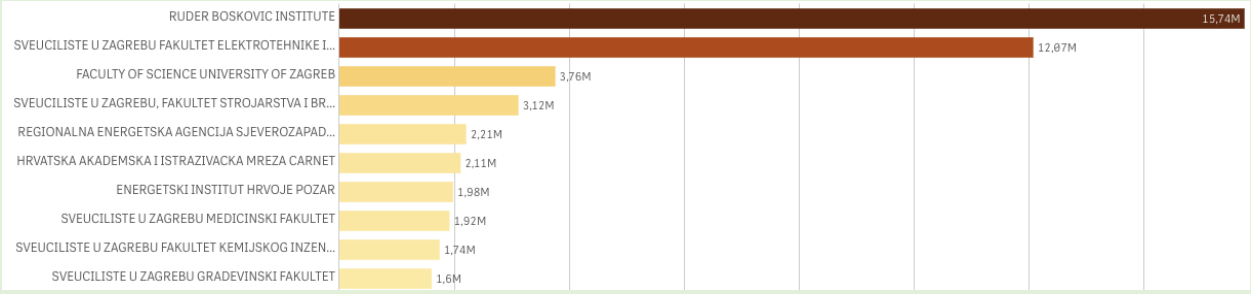

Figure 4.2. Croatia.4 –Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Of the EUR 128,9 million of net contribution Croatia has received from H2020 (accounting for 0,19% of the FP total budget), 27% goes to research organisation and 32% to the education sector. The third sector by net contribution received is the private for-profit sector (28%).

In list of top ten organisations by H2020 funding received, there are six are RTOs. Among those part of the education sector is the **Search Ruđer Bošković Institute**[29] (first), the **University of Zagreb, Faculty of Electrical Engineering and Computing (Fakultet elektrotehnike i računarstva)**[30], and the **Faculty of Science - Sveučilište u Zagrebu**. Notable research organisations by net funding received are the **Regionalna Energetska Agencija Sjeverozapadne Hrvatske** and **Hrvatska Akademija Znanosti i Umjetnosti**[31] (Croatian Academy of Sciences and Arts).

The table here below lists other relevant Croatian RTOs and the number of Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects they have been involved in:

RTO	Number of SC3 projects
Energetski Institut Hrvoje Pozar (EIHP) http://www.eihp.hr/	16
Ruđer Bošković Institute https://www.irb.hr/eng	15
Regionalna Energetska Agencija Sjeverozapadne Hrvatske (REGEA) https://regea.org	12
Medunarodni Centar Za Odrzivi Razvoj Energetike Voda I Okolisa https://www.sdewes.org/	4

Figure 4.2. Croatia.5 – Relevant RTOs participating in H2020 SC3 projects.

[29] *Ruđer Bošković Institute*, https://www.irb.hr/eng.
[30] *University of Zagreb*, http://www.unizg.hr/homepage/.
[31] *Hrvatska Akademija Znanosti i Umjetnosti*, https://www.info.hazu.hr/.

Reasons for H2020 lower performance according to the NCPs

During the webinar organised for the NCPs, Croatia's National Contact Points identified the following reasons as the main causes for Croatia 's lower participation in Horizon 2020:

1. Lack of administrative support to the institution submitting a proposal;
2. Lack of incentives for the academic institution submitting a proposal, given that as the Croatian NCP stated, "the participation in Horizon 2020 project is not a requirement for academic advancement, nor does it provide an advantage";
3. Local administrative barriers, due to the fact that "the manner of payment of funds from the faculty account to the scientist working on the project is not regulated."

Cyprus

Cyprus belongs to the IWGs on Concentrated Solar Power / Solar Thermal Electricity (CSP/STE), Deep geothermal, Solar Thermal Electricity (CSP/STE), Deep geothermal, Energy efficiency in industry, Energy system, Photovoltaics and Positive energy districts.

Cypriot NECP refers to the SET plan in combination with the Cyprus smart specialisation strategy as a guide for stakeholders identifying priority areas of R&I that will respond to both market needs and national targets for decarbonisation. According to the Commission's assessment of the Cypriot NECP, the R&I efforts outlined in the document are deemed credible in relation to the achievement of the target, as Cyprus plans to triple its annual spending on energy-and-climate-related R&I. However, examples and indicators in the NECP are not always clear. The NECP mentions cooperation with the SET plan but does not provide specific figures on how the SET Plan targets will be aligned with the national energy-and-climate targets for the period 2021-2030.32

According to the SETIS's Technology Development Report on Solar Thermal Electricity (2020), Cyprus is amongst the EU countries with the most significant effort on CSP R&D.[33]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Cyprus	0,56%	0,20%	38,4%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Cyprus	8,4%	27 out of 28 EU MSs
EU average	11,11%	

[32] *Assessment of the final national energy and climate plan of Cyprus* (European Commission, Oct. 2020), https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_cyprus_en.pdf.
[33] *Solar Thermal Electricity - Technology Development Report 2020* (SETIS, Feb. 2021), 19, https://setis.ec.europa.eu/solar-thermal-electricity-technology-development-report-2020_en.

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Cyprus	1,92%	4.970
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Cyprus	712	2,22%	946	0,62%	€ 310	0,52%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
666	60	107	107

Figure 4.2. Cyprus.1 – Horizon 2020 performance analysis.

Cyprus has a low total GERD score compared to all the averages here analysed. The same applies if GERD is split into both its public and private components. On the other hand, the level of knowledge-intensive employment is among the highest among the EU13 group and almost the same as the EU13 average and Cyprus is considered a Moderate Innovator according to the European Innovation Scoreboard. As far as the second assumption is concerned, the country has a high score for the top-cited publication rate – which is almost at the same level as the EU average, but not for researchers ratio. Concerning the third assumption, the percentage of eligible proposals is well above the EU13 average and almost twice as big as the EU average. Even if the total number of eligible proposals is not very high in absolute terms, it is yet relevant considering the country's limited dimension.

In terms of the indicators used to analyse Cyprus' performance, Cyprus has signed 712 grant agreements, which, besides being right below the EU13 average (814), is still a considerable amount if weighted for the small population of the country. On the other hand, the number of participations is lower as compared to the EU13 average.

Relevant stakeholders

The **Research & Innovation Foundation (IDEK)** is the Cypriot authority in charge of supporting and promoting research, technological development and innovation. It is also responsible for the national activities related with Horizon Europe.[34]

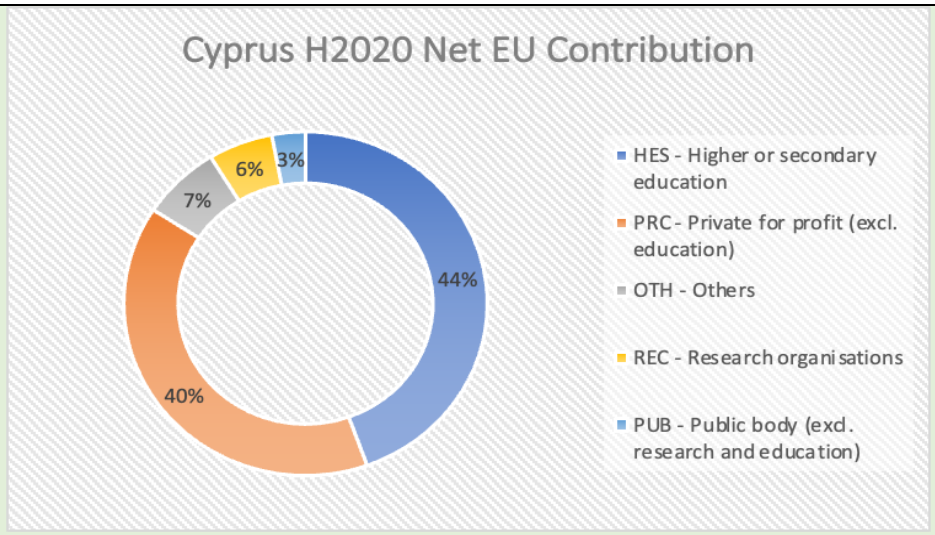

Figure 4.2. Cyprus.2 – Types of organisations based on net EU contributions.

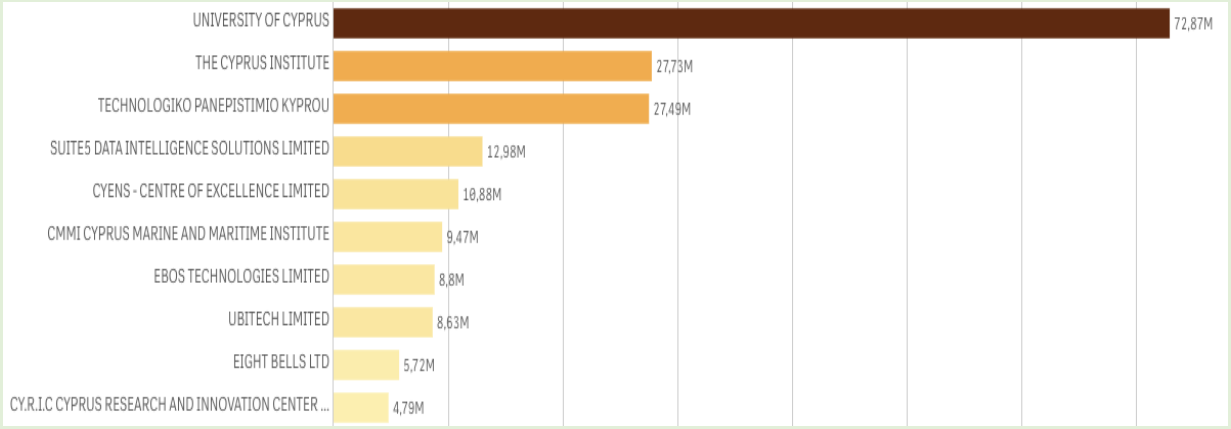

Figure 4.2.Cyprus.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

[34] *Research & Innovation Foundation (IDEK)*, https://www.research.org.cy/en/.

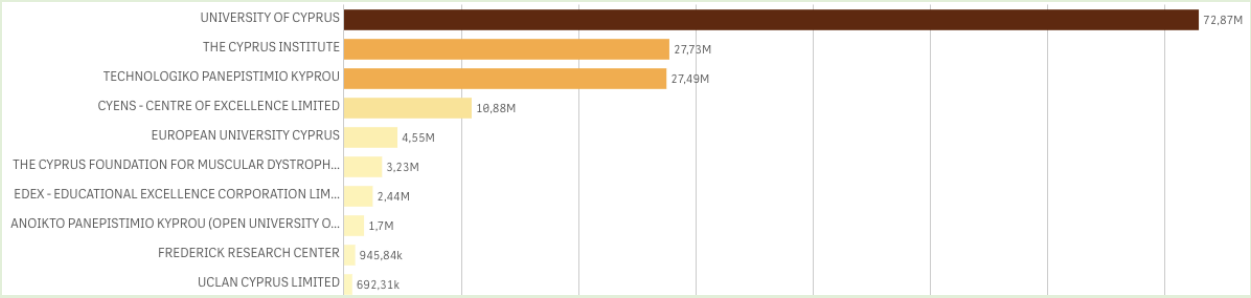

Figure 4.2.Cyprus.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Of the EUR 310,8 million of net amount of fund received from the grant, which is above the EU13 average value (EUR 267 million), 44% goes to the education sector while research gets only 6%. The private for-profit sector is the second recipient, receiving 40% of the contribution from the grant.

Only four RTOs are listed among the top ten organisations by funds received from the grant, the **University of Cyprus**,[35] the **Cyprus Institute (CyI)**,[36] the **Cyprus University of Technology**[37] and the **CYENS – Centre of Excellence Limited** (formerly known as RISE).[38]

Among these RTOs, the **Cyprus Institute** is an international science and technology organization with the goal to strengthen the research community of Cyprus, help transform its economy to a knowledge-based economy and to create a research hub for the Eastern Mediterranean region.

The table here below lists the number of Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects carried out by relevant RTOs.

RTO	Number of SC3 projects
University of Cyprus http://www.ucy.ac.cy/en/	16
Cyprus Energy Agency (CEA, Energeiako Grafeio Kyprion Politon) https://www.cea.org.cy/en/	7
The Cyprus Institute (CyI) https://www.cyi.ac.cy/	2

Figure 4.2. Cyprus.5 – Relevant RTOs participating in H2020 SC3 projects.

[35] *University of Cyprus*, http://www.ucy.ac.cy/en/.
[36] *The Cyprus Institute (CyI)*, https://www.cyi.ac.cy/.
[37] *Cyprus University of Technology*, https://www.cut.ac.cy/.
[38] *CYENS – Centre of Excellence Limited*, https://www.cyens.org.cy/en-gb/.

Reasons for H2020 lower performance according to the NCPs

Among the reasons stated by Cypriot's NCPs for the limited participation in H2020 are:

1. "Low level of national investment in R&I", which is consistent with the first assumption;
2. "Relatively young research community of the country", which if interpreted in terms of unexperienced, could be linked with the second assumption;
3. "Limited capacity of Cyprus industry (service-oriented economy)" that is more related to the shape of the national economy;
4. "Limited access of Cyprus research community to 'high-quality' international networks, which constitute the basis for the proposal consortia".

Czech Republic

As stated in the SETIS website, Czech Republic belongs to the Implementation Working Groups on batteries, Carbon Capture Utilisation (CCU) and Carbon Capture and Storage (CCS), Energy efficiency in industry, Nuclear safety and Positive energy districts. However, the Czech NECP claims that the country formally takes part in the three IWGs dealing with positive energy districts, energy efficiency in industry, and nuclear safety.[39]

According to the European Commission's assessment of the Czech NECP, the country involvement in the SET Plan is rather limited and not very developed in the national plan as there are no references to appropriate policies or measures to be developed. The Commission maintains that Czechia should enhance and clarify the connections with the SET Plan. Moreover, the country would also benefit from stronger links between the competitiveness objectives and the policies and measures to be put in place in the various sectors concerned by 2030. The Czech economy's large industrial base would benefit from a supportive environment to strengthen research, innovation and the competitiveness of the decarbonised technologies and sectors.[40]

In 2019 the **National Competence Centers (NCC) programme** was created to support applied research, experimental development, and innovation. At national level, the programme aims at strengthening the ties among existing research institutes focused on applied research and concentrate their research and technological capacities within the NCCs. At European level, NCC programme is reported seeking cooperation with other Member States and share information on how the SET Plan objectives and policies are translated to a national context. Moreover, the programme pursues synergies and complementary effects at EU level through Framework Programmes for Research and Innovation in line with the programme's focus.[41]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Czech Republic	1,79%	1,13%	31,6%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

[39] *National Energy and Climate Plan of the Czech Republic* (Nov. 2019), https://ec.europa.eu/energy/sites/ener/files/documents/cs_final_necp_main_en.pdf.
[40] *Assessment of the final national energy and climate plan of Czechia* (European Commission, Oct. 2020), https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_czechia_en.pdf.
[41] *National Energy and Climate Plan of the Czech Republic*.

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Czech Republic	6,3%	14 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Czech Republic	3,18%	8236
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Czech Republic	1.361	4,24%	1.828	1,20%	€ 493	0,83%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
1.249	97	179	38

Figure 4.2. Czech Republic.1 – Horizon 2020 performance analysis.

Regarding the firs assumption, Czech Republic has lower value for all the R&I system indicators except for the private R&D intensity which is (1,13%) while the EU average is 0,40%. As most other EU13 countries Czech Republic is labelled as moderate innovator in the European Innovation Scoreboard. Concerning the second assumption, Czech Republic has a top cited publication ration of 6,3% lower than the EU average of 11,11% and is ranked 14 out of 28 UE Member States in terms of Researchers ratio. In reference to the third assumption, the total

number of eligible proposals for Czech Republic is 8.236 (3,18% of total EU) which is the third highest eligibility number among the EU13 countries.

Czech Republic signed 1.361 Horizon 2020 grant agreement (4,24% of EU total) which is the second highest amount among EU13 countries. There are 1.828 organizations involved in Horizon 2020 projects. Czech Republic receive EUR 493 million (0,83% of the total amount of FP8) which is the second highest amount among EU13 countries.

Relevant stakeholders

The **Technology Platform Sustainable Energy for the Czech Republic (TPUE)** (in Czech: "Technologické platformy "Udržitelná energetika ČR")[42] is a national institution supporting Czech R&D activities aiming at developing technologies relevant for modern forms of energy. It contributes to the internationalization of Czech R&D projects related with energy. Its website mentions the SET Plan, but all the related documents date back to 2014.

With respect to nuclear safety, the **Centrum vyzkumu Rez (CVŘ)** – a subsidiary company of ÚJV Řež, a.s. – represents the Czech Republic at EERA and at the SET Plan since 2010. It is a research organisation pursuing research, development, and innovation in the field of nuclear energy.[43]

The **Energy Regulatory Office** is an administrative authority responsible for regulation in the energy sector.[44]

Horizont Evropa, the Czech portal for Horizon Europe; it runs workshops on a regular basis.[45]

[42] *TPUE*, http://tpue.cz/en/.
[43] CVŘ, http://cvrez.cz/en.
[44] *Energy Regulatory Office*, https://www.eru.cz/en/o-uradu.
[45] *Horizont Evropa*, https://www.horizontevropa.cz/cs.

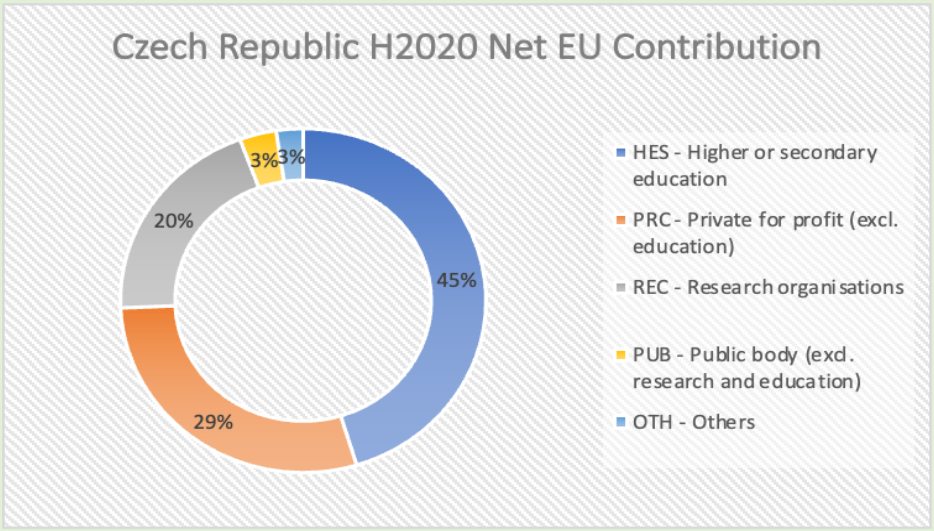

Figure 4.2. Czech Republic .2 – Types of organisations based on net EU contributions.

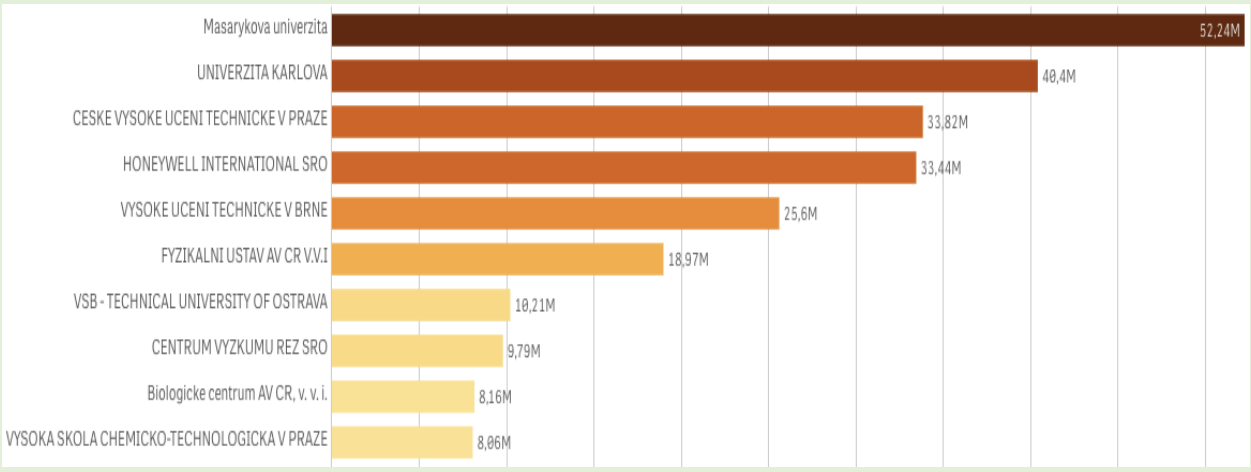

Figure 4.2.Czech Republic.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

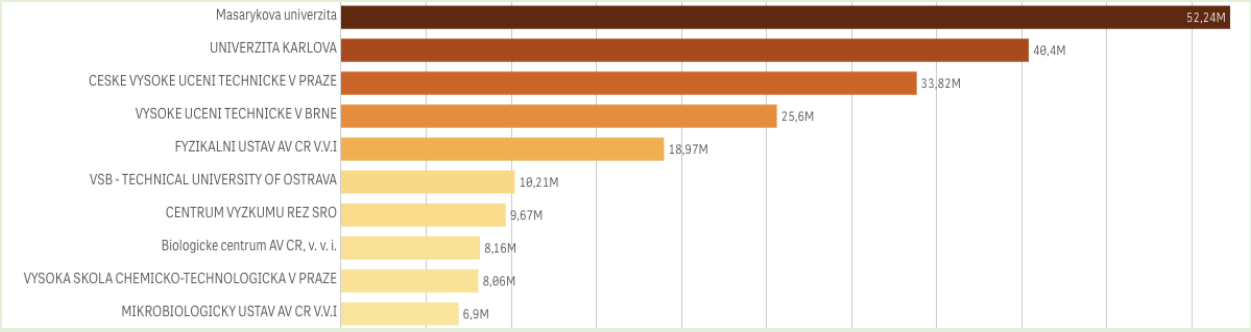

Figure 4.2.Czech Republic.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Of the EUR 493,8 million received from FP8, 45% goes to education, 20% to research, while the sector "others" gets 40% and private for-profit 29%.

There are only nine RTOs among the first ten organisations by H2020 contribution but given that the highest share of the grant goes to the education sector, only two of these nine belongs to the research sector, the **Centrum Vyzkumu Rez s.r.o.** (8th)[46] and the **Biologické centrum AV ČR** (9th).[47] The biggest recipient is the **Masaryk University**,[48] followed by the Univerzita Karlova,[49] and the **Ceske Vysoke Uceni Technicke** (Czech technical university in Prague).[50]

Coherently with EERA's main activities, other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects are enumerated in the table here below.

RTO	Number of SC3 projects
Ceska Geologicka Sluzba http://www.geology.cz/extranet	3
Comtes Fht As https://www.comtesfht.com/	2
Cz Biom - Ceske Sdruzeni Pro Biomasu https://czbiom.cz/	1
Ustav Fyziky Materialu, Akademie Ved Ceske Republiky, V.V.I. https://www.ipm.cz/	1

Figure 4.2. Czech Republic.5 – Relevant RTOs participating in H2020 SC3 projects.

[46] *Centrum Vyzkumu Rez s.r.o.*, http://cvrez.cz/en/.
[47] *Biologické centrum AV ČR*, https://www.bc.cas.cz/en/.
[48] Masaryk University, https://www.muni.cz/en.
[49] *Univerzita Karlova*, https://cuni.cz/UK-1.html.
[50] *Ceske Vysoke Uceni Technicke*, https://www.cvut.cz/en.

Reasons for H2020 lower performance according to the NCPs

Czech's NCPs have identified the following reasons for the lower participation in Horizon 2020:

1. "Lack of coordinators".
2. "Regional differences", which includes "lower salaries; language barrier; international bureaucratic divisions (e.g., the Academy of Sciences split into administratively independent research institutes); potential coordinators prefer not to work with entities unknown to them)".
3. "Low participation in ERA-NETs in Secure, clean and efficient energy".

Estonia

Even if the SETIS website reports Estonia being part of the Batteries IWG, according to the Commission's assessments of Estonian NECP, Estonia is instead part of the IWGs on Photovoltaics, Offshore wind energy and CCU-CCS.[51]

The Estonian NECP does not mention the SET Plan. Moreover, the EC's assessment of the national plan states that Estonia does not provide details on the activities carried out and funds allocated under the IP(s) or to what extent the SET Plan contributes to achieving its national energy and climate objectives.[52]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Estonia	1,29%	0,61%	33,1%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Estonia	7,6%	15 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Estonia	1,83%	4.736
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

H2020 performance

[51] Assessment of the final national energy and climate plan of Estonia (European Commission, Oct. 2020), 10, https://ec.europa.eu/energy/sites/ener/files/documents/staff_working_document_assessment_necp_estonia.pdf.
[52] *Ibidem*.

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Estonia	679	2,12%	858	0,57%	€ 258	0,43%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
633	51	61	97

Figure 4.2. Estonia.1 – Horizon 2020 performance analysis.

Concerning the first assumption, Estonia has lower value for all the R&I system indicators except for the private R&D intensity which is 0,61% while the EU average is 0,40%. Regarding the second assumption, Estonia has top cited publication ratio of 7,6% which is lower than the EU average 11,11% and is ranked 15 out of f 28 UE Member States in terms of Researchers ratio. Considering the third assumption, the total number of eligible proposals for Estonia is 4.736 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

Estonia signed 679 Horizon 2020 grant agreements (2,12% of EU total) out of 6.229 approved at EU13 level (19,43% of EU total) and 32.064 at the level of the whole EU. Approximately 858 Estonian organization participate in Horizon 2020 projects. Estonia receive EUR 258 million net EU contribution (0,43% of the total amount of FP8).

Relevant stakeholders

The **Estonian Research Council (ETA)** is the national portal for Horizon Europe.[53]

The education sector has received half of the total contribution from the grant, followed by the private for-profit sector (34%). Research organisations are at the end of the list, with only 3% of the total.

[53] *Estonian Research Council (ETA)*, https://www.etag.ee/en/.

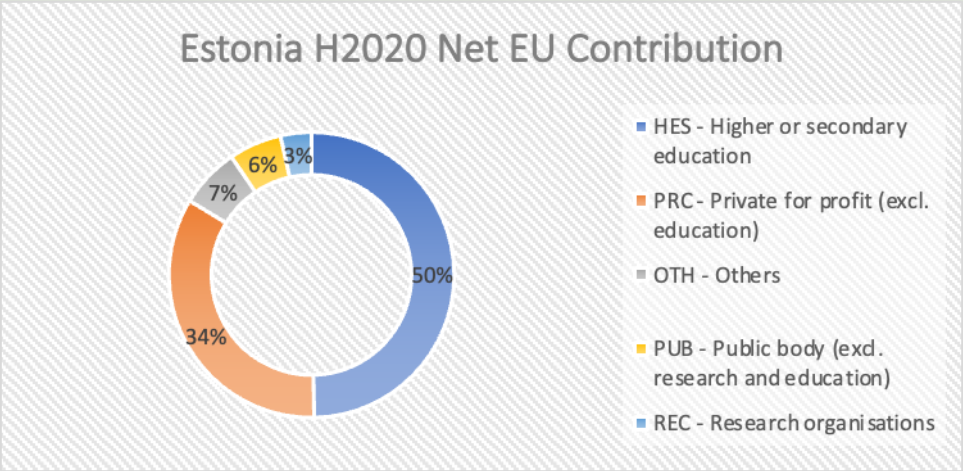

Figure 4.2. Estonia .2 – Types of organisations based on net EU contributions.

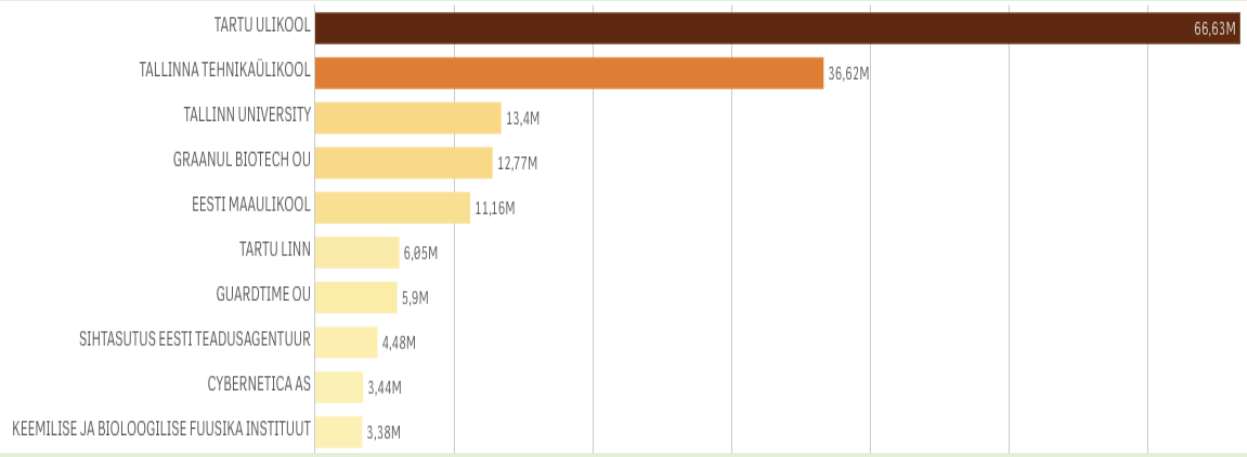

Figure 4.2.Estonia.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

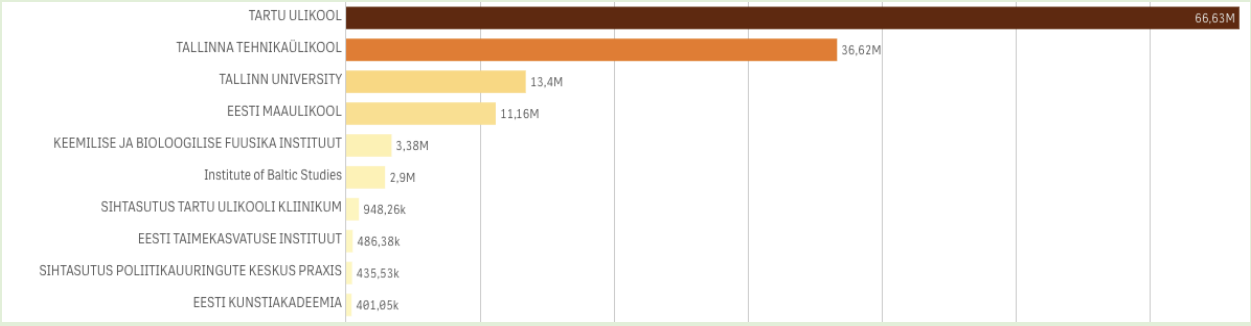

Figure 4.2.Estonia.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

The education sector has received half of the total contribution from the grant, while the research sector is at the bottom of the list with a meagre share of 3% of the total. The private for-profit sector is the second recipient (34%).

There are five RTOs among the first ten organisations by share of FP8 budget. The first is the **University of Tartu**,[54] the second is the **TalTech – Technische Universiteit Tallinn** (Tallinn University of Technology).[55] Among these five, only one belongs to the education sector, **Keemilise ja Bioloogilise Füüsika Instituut (KBFI)**.[56]

Other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects are:

RTO	Number of SC3 projects
Institute of Baltic Studies https://www.ibs.ee/en/	3
Sihtasutus Stockholmi Keskkonnainstituudi Tallinna Keskus https://www.sei.org/centres/tallinn-et/	1

Figure 4.2. Estonia.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

Estonia reported no reasons for the lower performance during NCPs webinar.

[54] *University of Tartu*, https://www.ut.ee/en.
[55] *TalTech – Technische Universiteit Tallinn*, https://taltech.ee/.
[56] *Keemilise ja Bioloogilise Füüsika Instituut (KBFI)*, https://kbfi.ee/.

Hungary

According to the SETIS website, Hungary participates in the Implementation Working Groups Batteries, carbon capture utilisation and storage and Nuclear safety.

The Commission's assessment of the Hungarian NECP praises the rich overview provided about Hungary's participation in the working groups on CCU-CCS as well as nuclear safety. Nonetheless, the document does not indicate national funds or activities under the programmes and does not specify how the SET plan would contribute to achieving Hungary's national energy and climate objectives. [57]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Hungary	1,35%	0,99%	33,6%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Hungary	6,3%	19 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Hungary	3,25%	8.417
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[57] *Assessment of the final national energy and climate plan of Hungary* (European Commission, Oct. 2020), 11, https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_hungary_en.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Hungary	1.113	3,47%	1.480	0.98%	€ 364	0,61%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
1.041	70	112	24

Figure 4.2. Hungary.1 – Horizon 2020 performance analysis.

Referring to the first assumption, Hungary has lower value for all the R&I system indicators except for the private R&D intensity which is 0,99% and is labelled as moderate innovator. Concerning the second assumption, Hungary has a ration of 6,3% which is lower than the EU average 11,11% and is ranked 19 out of 28 UE Member States in terms of Researchers ratio (i.e., Researchers per Thousand Employment). Considering the third assumption, the total number of eligible proposals for Hungary is 8.417 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

Hungary signed 1.113 Horizon 2020 grant agreements (3,47% of EU total) the third highest percentage among EU13 countries. Overall, 1.480 Hungarian organization participate in the Horizon 2020 projects. Hungary receive EUR 364 million (0,61% of the total amount of FP8).

Relevant stakeholders

The **Ministry of Innovation and Technology** is the national institution competent for R&I and the author of the NECP.[58] The **National Research, Development and Innovation Office (NKFIH)** is the institution in charge of European Affairs and Horizon Europe. [59]

[58] *Hungarian Ministry of Innovation and Technology*, https://kormany.hu/innovacios-es-technologiai-miniszterium.
[59] *National Research, Development and Innovation Office (NKFIH)*, https://nkfih.gov.hu/palyazoknak.

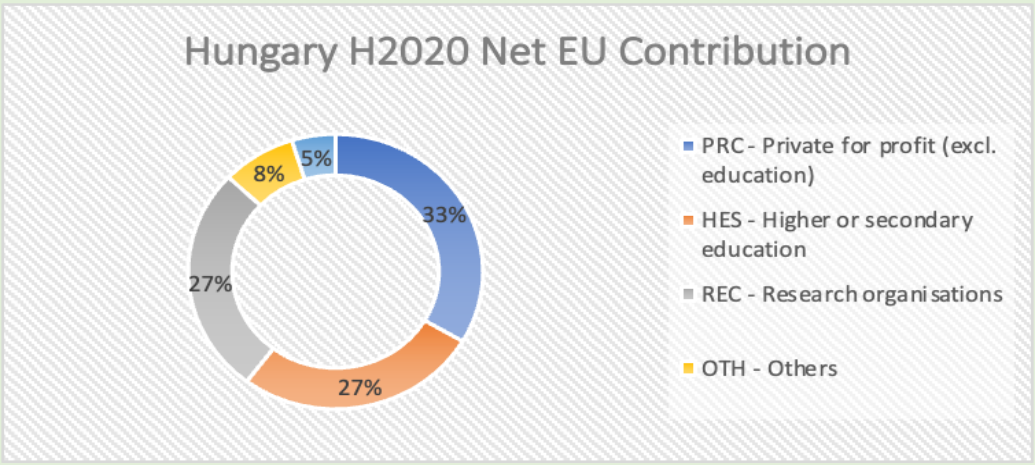

Figure 4.2. Hungary .2 – Types of organisations based on net EU contributions.

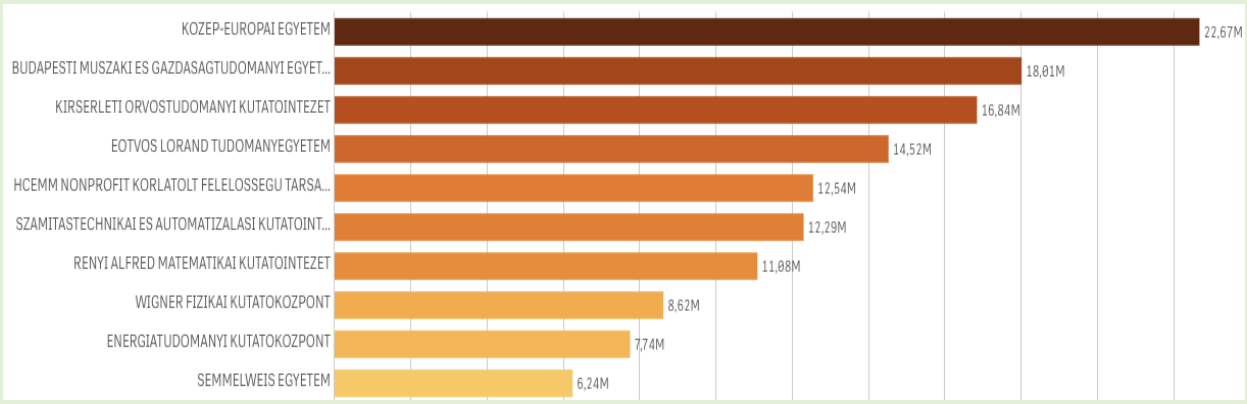

Figure 4.2.Hungary.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

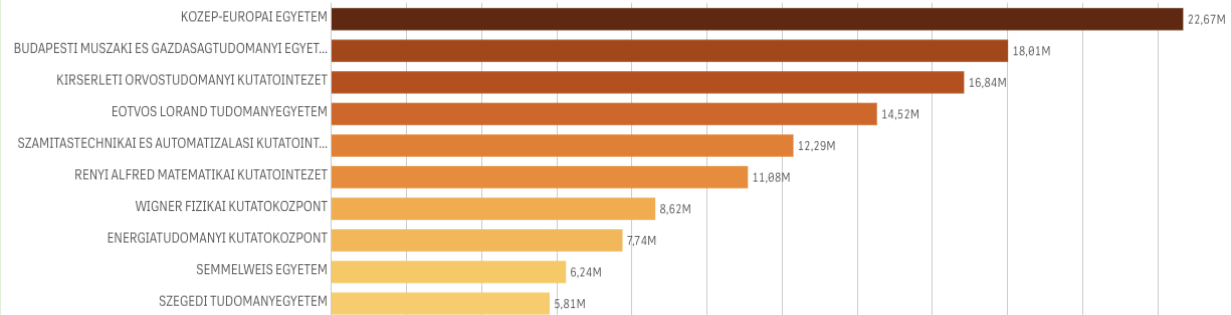

Figure 4.2.Hungary.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Hungary has received net EUR 364,2 million from FP8, which is split among private for-profit (33%), education (27%), research organisation (27%), others (8%) and public sector (3%).

Nine out of the ten first recipients from the FP8 grant are RTOs, namely: **Közép-európai Egyetem** (Central European University),[60] **Budapesti Műszaki és Gazdaságtudományi Egyetem**,[61] **Kísérleti Orvostudományi Kutatóintézet**,[62] **Szamitastechnikai autimatizalasi**, **Alfréd Rényi Mathematical Research Institute** (Rényi Alfréd Matematikai Kutatóintézet),[63] **Wigner Research Centre for Physics** (Wigner Fizikai Kutatóközpont),[64] and **Center for Energy Research** (Energiatudományi Kutatóközpont, EK).[65]

The table below shows other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects.

RTO	Number of SC3 projects
Budapesti Muszaki Es Gazdasagtudomanyi Egyetem https://www.bme.hu/	7
Greendependent Intezet Nonprofit Kozhasznu Korlatolt Felelossegu https://intezet.greendependent.org/	4
Energiaklub Szakpolitikai Intezet Es Modszertani Kozpont Egyesulet https://energiaklub.hu/en	4
Emi Epitesugyi Minosegellenorzo Innovacios Nonprofit Kft https://www.emi.hu/	3

Figure 4.2. Hungary.5 – Relevant RTOs participating in H2020 SC3 projects.

[60] *Közép-európai Egyetem*, https://www.ceu.edu/.
[61] *Budapesti Műszaki és Gazdaságtudományi Egyetem*, https://www.bme.hu/.
[62] *Kísérleti Orvostudományi Kutatóintézet*, http://koki.hu/.
[63] *Alfréd Rényi Mathematical Research Institute*, https://www.renyi.hu/hu.
[64] *Wigner Research Centre for Physics*, https://wigner.hu/hu.
[65] *Center for Energy Research*, https://www.ek-cer.hu/en/home/.

Reasons for H2020 lower performance according to the NCPs

During the webinar for NCPs, Hungarian representatives named the following causes to explain the lower performance of the country:

1. Relative ease of access to alternative structural funds, which then acts as a disincentive to submit H2020 proposals;
2. Lack of strong international connections, i.e., “limited involvement in European networks, little experience in transnational cooperation”;
3. Lack of experience, since Hungary was described as “lack[ing] of experience and missing capacities in project management”.

Latvia

Latvia is part of the Implementation Working Groups on Batteries, Energy efficiency in buildings, Energy efficiency in industry, Energy system, and Positive energy districts.

The Latvian NECP does not list any specific R&I objectives or target indicators in existing policies for the development of clean technologies and innovation focusing on improvement of energy efficiency and decarbonisation. In the table below are Latvia's investments in SET Plan priorities. Those marked in green are the country's priorities in terms of R&I for the period 2014-2018.[66]

SET-Plan priorities[162]	Actual value	Target value
	In the period from 2014 to 2018	In the period from 2021 to 2027
RE	10%	*15%*
Smart energy systems	26%	*20%*
Energy efficient systems (residential buildings and industry)	28%	*38%*
Sustainable transport	15%	*20%*
Carbon capture and storage	0%	*2%*
Safe nuclear energy	0%	*0%*
Energy management and market	20%	*5%*

Figure 4.2. Latvia. 1 Latvia's investments in SET Plan priorities (share of investment in total R&I investments in the field of energy).

The Commission's assessment of the Latvian NECP claims that Indicative funding to energy efficiency, renewable energy sources, smart energy systems and sustainable transport is expected to account for 93% of the total R&I investments for sustainable energy for 2021 to 2027. Moreover, it maintains that Latvia does not explain its activities and funds allocated under each IPs or how the SET plan contributes to achieving their national energy and climate objectives.[67]

[66] *Latvia's National Energy and Climate Plan 2021–2030* (Cabinet of Ministers, Nov. 2020), 92-93, https://ec.europa.eu/energy/sites/default/files/documents/lv_final_necp_main_en.pdf.
[67] *Assessment of the final national energy and climate plan of Latvia* (European Commission, Oct. 2020), 11, https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_latvia_en.pdf.

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Latvia	0,51%	0,14%	33,0%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Latvia	5,9%	26 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Latvia	1,07%	2.782
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Latvia	424	1,32%	526	0,35%	€ 114	0,19%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
392	53	32	60

Figure 4.2. Latvia.2 – Horizon 2020 performance analysis.

Considering the first assumption, Latvia has lower values for all the R&I system indicators in comparison to EU average and is labeled as moderate innovator. Referring to the second assumption, Latvia has a top cited publication rate of 5,9% lower by almost two times than the EU average 11,11%. Latvia is ranked 26 out of 28 UE Member States in terms of Researchers ratio (i.e., Researchers per Thousand Employment). Regarding the third assumption, the total number of eligible proposals for Latvia is 2.782 which is the second lowest number among the EU13 countries.

As indicated in the performance table, Latvia signed 424 Horizon 2020 agreements (1,32% of EU total) which after Malta is the second lowest percentage. In general, 526 Latvian organizations participate in Horizon 2020 projects. Latvia receive EUR 114 million (0,19% of the total amount of FP8) which is the third lowest amount among the EU13 countries.

Relevant stakeholders

The **Latvian Ministry of Economics (EM)** is the national institution in charge of energy matters.[68]

The **State Education Development Agency (VIAA)** is a public body subordinated to the Ministry of Education and Science. It oversees the implementation of EU-funded projects, Horizon Europe included.[69]

Magnetic Latvia / Labs of Latvia is an institutional website publishing news in innovations, technologies, science, research and business.[70] It belongs to the **Investment and Development Agency of Latvia (LIAA)**.[71]

[68] *Latvian Ministry of Economics (EM)*, https://www.em.gov.lv/lv.
[69] *State Education Development Agency (VIAA)*, https://viaa.gov.lv/lat/.
[70] *Magnetic Latvia / Labs of Latvia*, https://labsoflatvia.com/.
[71] *Investment and Development Agency of Latvia (LIAA)*, http://eksports.liaa.gov.lv/.

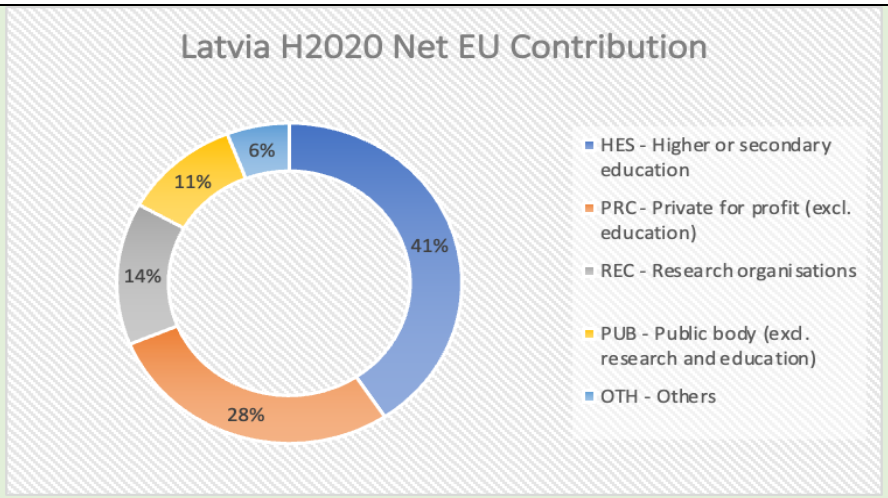

Figure 4.2. Latvia .3 – Types of organisations based on net EU contributions.

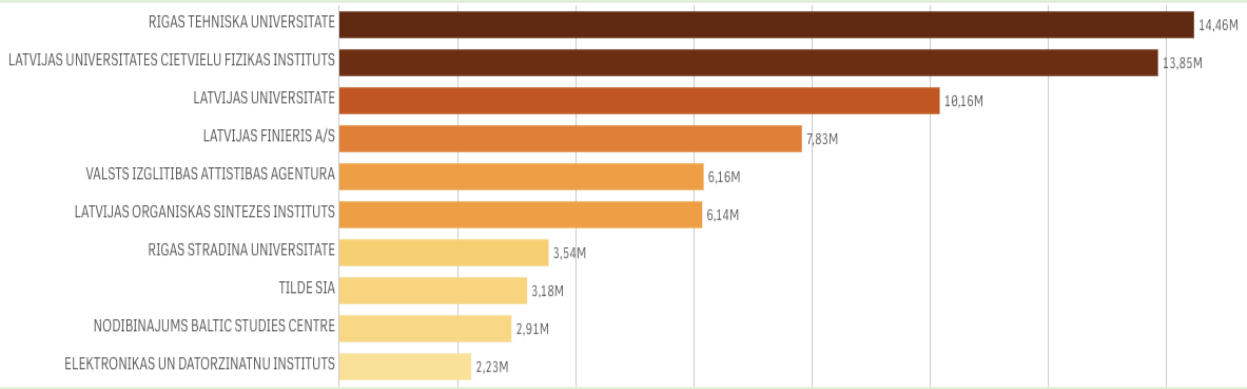

Figure 4.2.Latvia.4 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

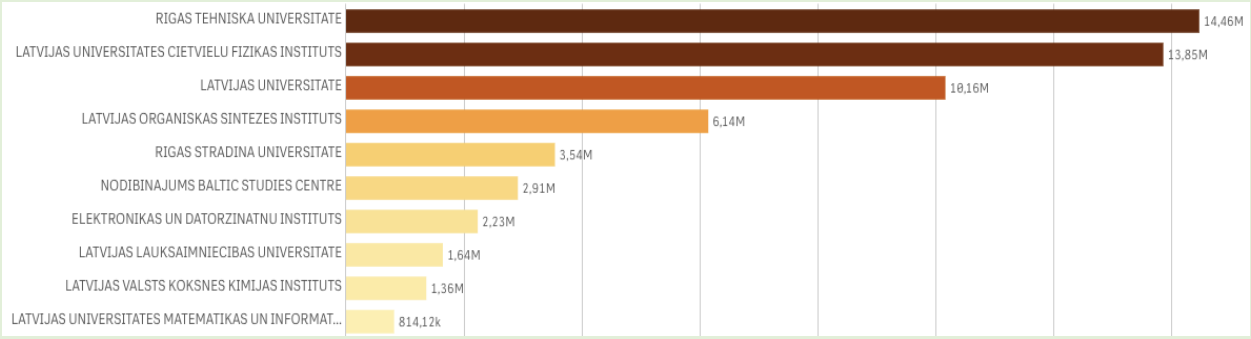

Figure 4.2.Latvia.5 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

The education sector receives the highest share of the Horizon 2020 budget (41%), while research gets 14%. The second recipient is the private for-profit sector, with a share of 28%.

Seven RTOs are in listed among the 10 main FP8 recipients, the most important are the **Rigas Tehniska Universitate**,[72] **Latvijas Organiskās sintēzes institūts**,[73] **Nodibinajums Baltic Studies Centre**,[74] **Elektronikas un Datorzinatnu Institūts**.[75]

In line with EERA's main activities, other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects are shown in the table below.

RTO	Number of SC3 projects
Rigas Tehniska Universitate / Riga Technical University (RTU) https://www.rtu.lv/	9
Institute Of Physical Energetics, Ipe (Fizikalas Energetikas Instituts) http://fei-web.lv/lv/	6
Riga Energy Agency, Rea (Rīgas Enerģētikas Agentūra) https://rea.riga.lv/	2

Figure 4.2. Latvia.6 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

During the webinar for NCPs, Latvian National Contact Points' representatives named the following reasons as possible causes of the limited participation in Horizon 2020:

[72] *Rigas Tehniska Universitate*, https://www.rtu.lv/en.
[73] *Latvijas Organiskās sintēzes institūts*, https://www.osi.lv/.
[74] *Nodibinajums Baltic Studies Centre (BSC)*, http://www.bscresearch.lv/#about.
[75] *Elektronikas un Datorzinatnu Institūts*, https://www.edi.lv/en/.

1. Small number of researchers and their high average age due to brain drain – which confirms the second assumption;
2. “Limited state budget support for development of scientific infrastructure and for salaries of researchers”, i.e., relative weakness of the Latvian R&I systems, which confirms the first assumption
3. “There are few large companies in Latvia, and most undertakings are SMEs with relatively small budgets for R&D activities” that is related with the first assumption in relation to the limited R&D intensity of the private sector.

Lithuania

Lithuania belongs to the Implementation Working Groups of Batteries and Nuclear safety.

The Commission's assessment of Lithuania's NECP claims that the document broadly addresses cooperation with the SET plan, even if Lithuania does not participate actively in the SET plan framework, except on the two IPs mentioned above. However, nine further SET plan areas are recognised in the NECP as possibly relevant for achieving the country's energy R&I ambition.[76]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Lithuania	0,88%	0,32%	32,1%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Lithuania	4%	17 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Lithuania	1,27%	3.282
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[76] *Assessment of the final national energy and climate plan of Lithuania* (European Commission, Oct. 2020), 12, https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_lithuania_en.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Lithuania	493	1,54%	597	0,39%	€ 93	0,16%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
461	51	45	1

Figure 4.2. Lithuania.1 – Horizon 2020 performance analysis.

For the future, Lithuania seeks to receive more from Horizon Europe and thus it is strengthening its network of national contact points, allocating EUR 50 million of its EUR 6 300 million post-Covid economic recovery package to the cause.[77]

Considering the first assumption Lithuania has lower values for all the R&I system indicators in comparison to EU average and is labelled as moderate innovator. Referring to the second assumption Lithuania has a top cited publication rate of 4% which is almost by three times lower than the EU average 11,11%. Lithuania is ranked 17th out of 28 EU Member States in terms of Researchers ratio. Regarding the third assumption the total number of eligible proposals for Lithuania is 3.282 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

As stated in the performance table Lithuania signed 493 Horizon 2020 grant agreements (1,54% of EU total) which is the third lowest amount among the EU13 countries. Overall, there are 597 Lithuanian organization involved in the Horizon 2020 projects. Lithuania receive EUR 93 million (0,16% of the total amount of FP8) which is the second lowest amount among EU13 countries.

[77] Goda Naujokaitytė, *Baltic states want more out of Horizon Europe* (Science Business, Oct. 2020), https://sciencebusiness.net/framework-programmes/news/baltic-states-want-more-out-horizon-europe.

Relevant stakeholders

Among the relevant national public entities is the **Lithuanian Agency for Science, Innovation and Technology (MITA)**[78] and the **Lithuanian RDI Liaison Office in Brussels (LINO)**, which aims is to strengthen European research cooperation facilitating the successful integration of Lithuanian researchers into international research projects and to monitor, analyse and report on developments in EU research and innovation policy.[79]

The **Innovation and Internationalization Promotion Group** is the Unit within the Ministry of Energy in charge of EU Affairs.[80]

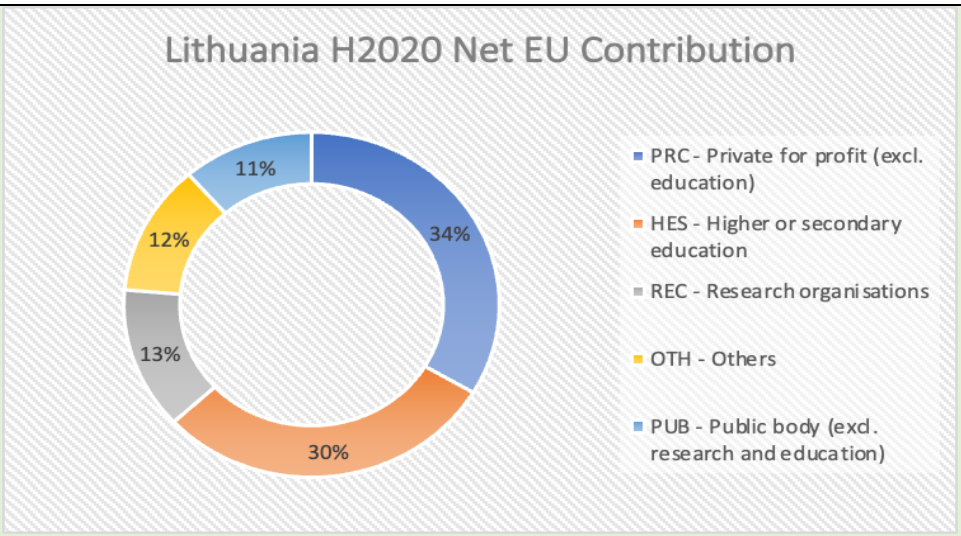

Figure 4.2. Lithuania .2 – Types of organisations based on net EU contributions.

[78] *Lithuanian Agency for Science, Innovation and Technology (MITA)*, https://mita.lrv.lt/lt/.
[79] *Lithuanian RDI Liaison Office in Brussels (LINO)*, https://www.lmt.lt/en/science-policy-implementation/international-collaboration/lithuanian-rdi-liaison-office-lino/2418.
[80] *Innovation and Internationalization Promotion Group*, https://enmin.lrv.lt/lt/veiklos-sritys-3/es-reikalu-koordinavimas/es-reikalu-koordinavimas-energetikos-ministerijoje.

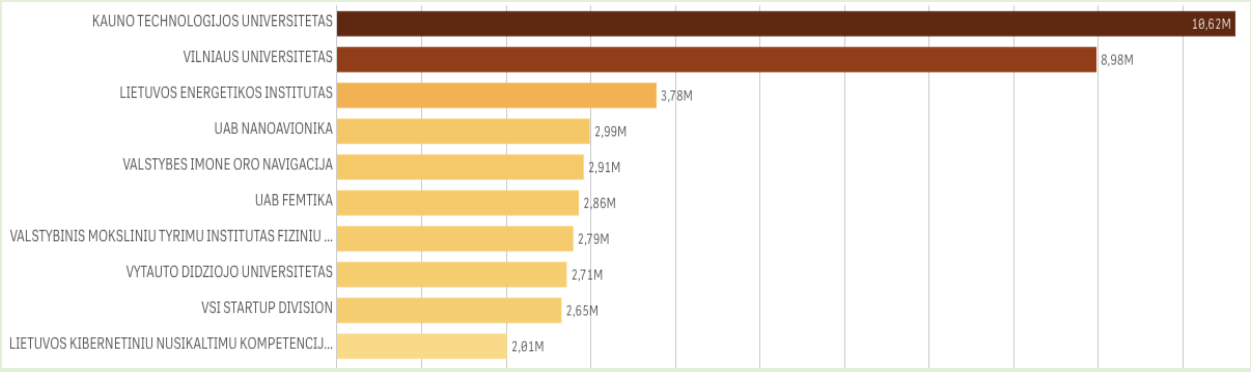

Figure 4.2.Lithuania.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

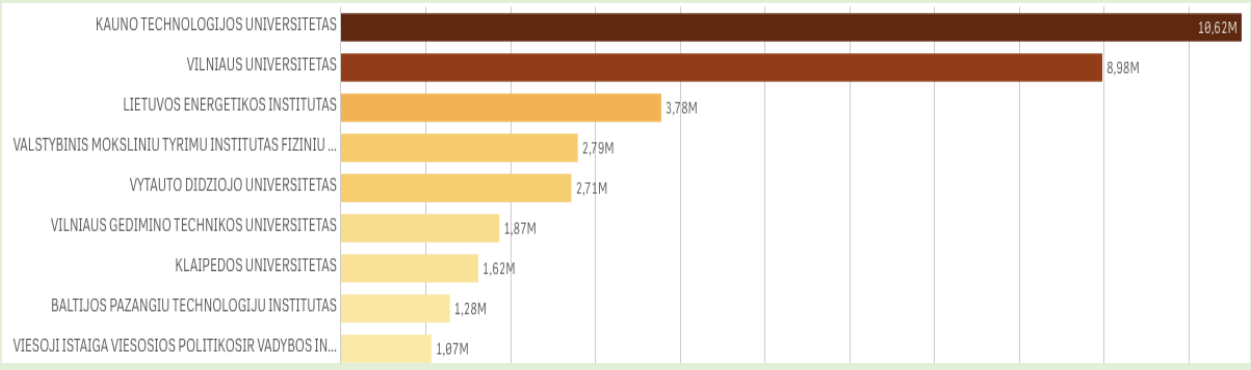

Figure 4.2.Lithuania.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

34% of the EUR 93,99 million net contribution from FP8 goes to the private for-profit sector, while the education sector receives 30% and research organisation 13% only. Among the different beneficiaries in Lithuania the **Kauno Technologijos Universitetas**[81] is the top beneficiary followed by **Vilniaus Universitetas**[82] in the second place and **Lietuvos Energetikos Institutas**[83] in the third place. Within the top ten H2020 beneficiaries 4 of them are RTOs.

Below are other relevant Lithuanian RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects.

[81] *Kauno Technologijos Universitetas*, https://ktu.edu/.
[82] *Vilniaus Universitetas*, https://www.vu.lt/.
[83] *Lietuvos Energetikos Institutas*, https://www.lei.lt/.

RTO	Number of SC3 projects
Lietuvos Energetikos Institutas, LEI https://www.leikodas.lt/	9
Kaunas University of Technology (Kauno technologijos universitetas) https://stojantiesiems.ktu.edu/	4
Perspektyviniu Technologiju Taikomuju Tyrimu Institutas https://protechnology.lt/	2

Figure 4.2. Lithuania.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

Lithuania's NCPS did not mention any reasons for the lower performance in Horizon 2020.

Malta

Malta is part of the Implementation Working Group on Batteries.

Malta's NECP does not mention any contribution to the SET Plan's actions for 2021-2030 and there is no explanation on how the SET Plan contributes to meeting the national energy and climate objectives.[84]

In July 2020, the Energy and Water Agency published the **National Strategy for Research and Innovation in Energy and Water 2021-2030**, but this does not refer to the SET Plan.[85]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Malta	0,55%	0,34%	41,8%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Malta	10,5%	25 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Malta	0,54%	1.390
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[84] *Malta's 2030 National Energy and Climate Plan* (Dec. 2019), https://ec.europa.eu/energy/sites/default/files/documents/mt_final_necp_main_en.pdf.
[85] *Malta's National Strategy for Research and Innovation in Energy and Water 2021-2030* (Energy and Water Agency), https://mk0energywaterabbylt.kinstacdn.com/wp-content/uploads/2020/06/National-Strategy-for-RI-in-Energy-and-Water-FINAL.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Malta	184	0,57%	247	0,16%	€ 36	0,06%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
170	17	24	13

Figure 4.2. Malta.1 – Horizon 2020 performance analysis.

Referring to the first assumption Malta has relatively low values for all the R&I system indicators except for the knowledge intensive employment which is 41,8% while the EU average is 36,10%. Malta is considered as moderate innovator in the European Innovation Scoreboard. Regarding the second assumption Malta has a top cited publication rate of 10,5% very close to the EU average 11,11% and is ranked 25th out of 28 UE Member States in terms of Researchers ratio (i.e., Researchers per Thousand Employment). Considering the third assumption the total number of eligible proposals for Malta is 1.390 which is the lowest number of eligible proposals among the EU13 countries.

Malta signed 184 Horizon 2020 grant agreements (0,57% of EU total) which is the lowest percentage among EU13 countries. Malta receive EUR 36 million (0,06% of the total amount of FP8) and is thus located at the bottom of the list among the EU13 countries.

Relevant Stakeholders

Among the relevant national institutions is the **Malta Council for Science and Technology**, in charge of Horizon Europe. It acts for and on behalf of the **Foundation for Science and**

Technology, a public body created in 1988 to advise the government on science and technology policy. [86]

The **Energy and Water Agency** is a government body set up in 2014 to formulate and implement Government's national policies in the energy and water sectors, aimed at ensuring security, sustainability, and affordability of energy and water in Malta.[87]

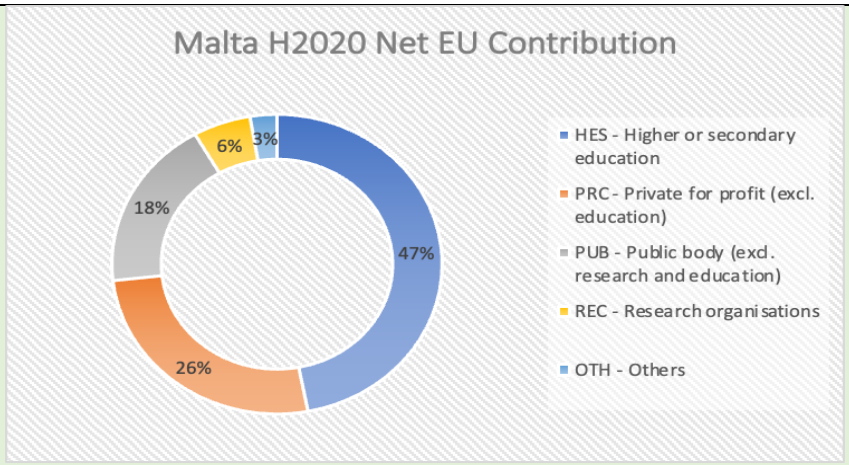

Figure 4.2. Malta .2 – Types of organisations based on net EU contributions.

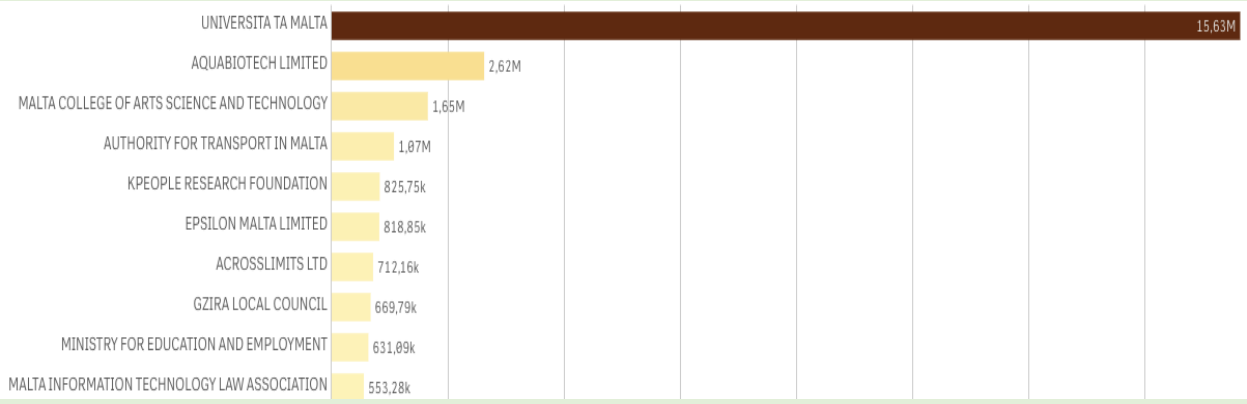

Figure 4.2.Malta.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

[86] *Malta Council for Science and Technology*, http://mcst.gov.mt/.
[87] *Energy and Water Agency*, https://www.energywateragency.gov.mt/.

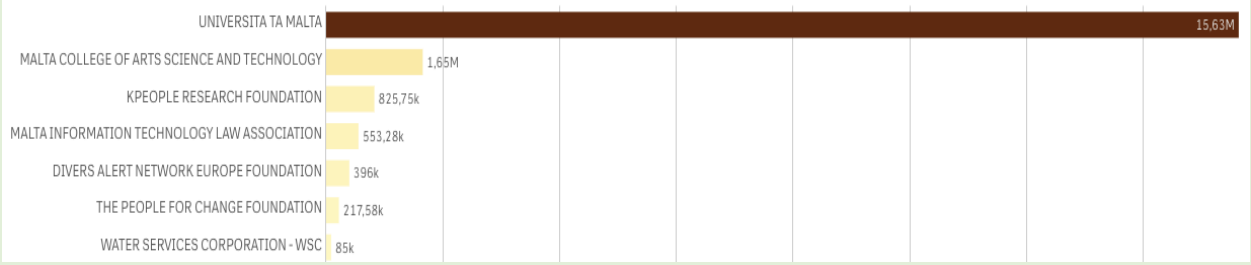

Figure 4.2.Malta.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Malta receives a meagre contribution of EUR 36,79 million from H2020 in which the highest portion (47%) is allocated to higher or secondary education. Only 6% of the H2020 contribution is assigned to the research organizations. **Universita TA Malta**[88] is the top-ranking beneficiary receiving EUR 15,63 million. Among the different research organizations **Malta College of Arts Science and Technology**[89] and **KPEOPLE Research Foundation**[90] receives the highest portion of the grant. Within the top ten H2020 beneficiaries 4 of them are RTOs.

Other important RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects are in the table below.

RTO	Number of SC3 projects
Malta Competition and Consumer Affairs Authorithy (MCCAA) https://mccaa.org.mt/	3
Malta Intelligent Energy Management Agency https://miema.org/	2
Authority for Transport in Malta https://www.transport.gov.mt/	1

Figure 4.2. Malta.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

Different possible reasons have been indicated by the Malta NCPs; below are the key points.

1. Lack of experience and lack of excellence have been introduced as possible reasons for lower performance, confirming the first assumption of the deliverable on R&I weaknesses.
2. Limited quantity/Lower propensity to send proposals is indicated as another cause of lower performance by the NCPs, which implies lower quality proposals in line with the third assumption.

[88] *Universita TA Malta*, https://www.um.edu.mt/.
[89] *Malta College of Arts Science and Technology*, https://www.mcast.edu.mt/.
[90] *KPEOPLE Research Foundation*, https://www.kpeople.eu/.

3. Limited industry, lack of research centres, and small research community is also highlighted as a key point for lower H2020 performance. This point is associated with the first assumption on the weakness of the research and innovation system.

Poland

Poland participates in the Implementation Working Group on Batteries, Energy efficiency in industry, Nuclear safety and Positive energy districts.

According to the Commission's assessment of the Polish NECP, the document "provides a complete and consistent overview of Poland participation in the different working groups […]. However, there is no allocation of national funds or activities and no information on how SET Plan contributes to achieving Poland's energy and climate objectives".[91]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Poland	1,03%	0,67%	29,5%	Moderate innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Poland	4,9%	18 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Poland	5,38%	13.935
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[91] Assessment of the final national energy and climate plan of Poland (European Commission, Oct. 2020), https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_poland_en.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Poland	1.902	5,93%	2.749	1,81%	€ 713	1,20%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
1.769	143	238	17

Figure 4.2. Poland.1 – Horizon 2020 performance analysis.

As indicated in the three assumptions, Poland has values lower than the EU average and EU15 average for all the indicators, showing the relative weakness of Poland in the research and innovation system, lack of scientific excellence, and submission of good quality proposals. However, among the EU13 countries, Poland receives the highest H2020 Net EU contribution (EUR 713,2 million) and is getting closer to the EU average.

Concerning the first assumption Poland has lower value for all the R&I system indicators except for the private R&D intensity which is (0,67%) while the EU average is 0,40%. Poland is considered moderate innovator in the European Innovation Scoreboard. Referring to the second assumption Poland has a ratio of 4,9% for the top cited publication which is lower by more than two times than the EU average 11,11% and is ranked 18 out of 28 UE Member States in terms of Researchers ratio. Regarding the third assumption the total number of eligible proposals for Poland is 13.935 which is the highest number among the EU13 countries.

Poland signed 1.902 Horizon 2020 grant agreements (5,93% of EU total) which is the highest percentage among EU13 countries. Poland receive EUR 713 million (1,20% of the total amount of FP8).

Relevant Stakeholders

Among the national public stakeholders relevant in the domain of R&I is the **National Centre for Research and Development (NCBR)**.[92] As far as EU Affairs is concerned, there are the **National Center for Research and Development in partnership with Business & Science Poland (BSP)**[93] conducting joint advisory, information and support activities in Brussels and the **Polish Science Contact Agency (PolSCA)** which seeks to promote the participation of the Polish scientific community in European projects and initiatives, especially those related with FPs.[94]

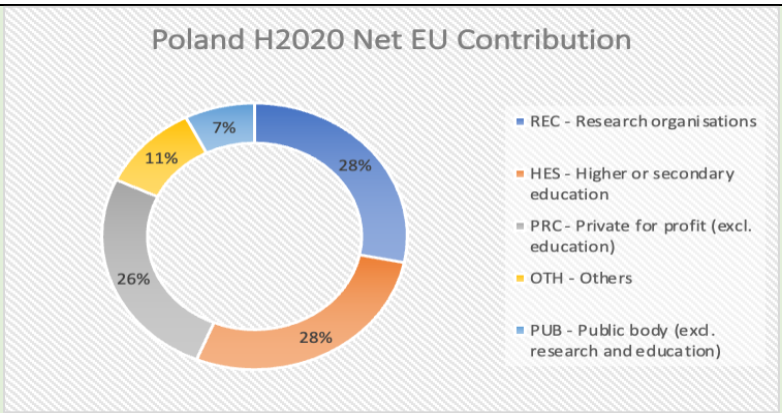

Figure 4.2. Poland .2 – Types of organisations based on net EU contributions.

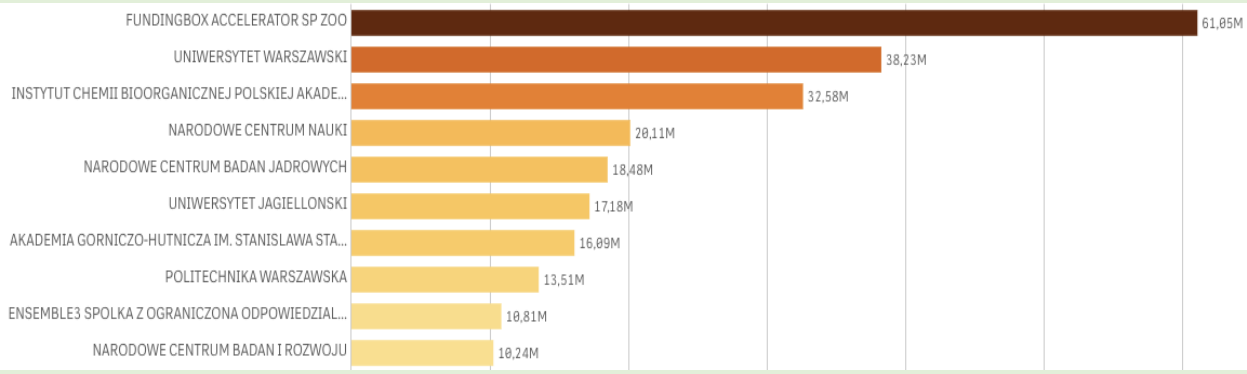

Figure 4.2.Poland.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

[92] *National Centre for Research and Development (NCBR)*, https://www.gov.pl/web/ncbr.
[93] *National Center for Research and Development in partnership with Business & Science Poland (BSP)*, https://www.gov.pl/web/ncbr-en/department-of-support-for-polish-entities-in-brussels.
[94] *Polish Science Contact Agency (PolSCA)*, http://polsca.pan.pl/.

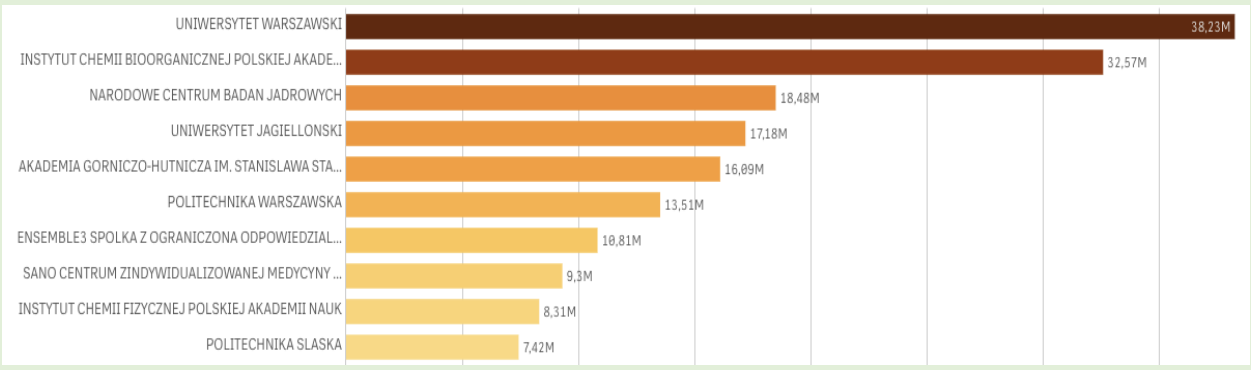

Figure 4.2.Poland.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

As indicated in the performance table, Poland receives EUR 713,2 million net contribution from H2020, of which (28%) is dedicated to research organizations. The same share is also dedicated to higher and secondary education. The highest beneficiary of H2020 is the **Fundingbox Accelerator SP Zoo**. Among the different research institutions, the first ranking beneficiary is the **Uniwersytet Warszawski** followed by the **Instytut Chemy Bioorganicznej Polskiej Akademii** in the second place. In general, among the first ten H2020 beneficiaries there are 8 RTOs.

Other important RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects are shown in the following table.

RTO	Number of SC3 projects
Instytut Energetyki https://www.ien.com.pl/	15
ASM - Centrum Badan I Analiz Rynkuspolka Z Ograniczona Odpowiedzialnoscia http://asm-poland.com.pl/en/	4
Panstwowy Instytut Geologiczny - Panstwowy Instytut Badawczy https://www.pgi.gov.pl/en/	4
Instytut Gospodarki Surowcami Mineralnymi I Energia Pan https://min-pan.krakow.pl/en/	4

Figure 4.2. Poland.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

The Polish NCPs have indicated different possible reasons for the limited H2020 performance. Below are the key points.

1. Old member states do not believe in the excellence of the EU13, and they are giving minor role to EU13 in their proposals.
2. Lack of strong international connections and professional network has been the other reason stated by the NCP.
3. Easy access to alternative funding sources such as structural funding is the other reason stated by the NCPs.

Romania

Romania participates in the Implementation Working Groups on Batteries, Nuclear safety and Positive energy districts.

Cooperation with the SET Plan is only mentioned to a limited extent in the Romanian NECP and no further details are provided.[95]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Romania	0,50%	0,29%	21,6%	Modest Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Romania	4,6%	28 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Romania	2,95%	7.651
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[95] Assessment of the final national energy and climate plan of Romania (European Commission, Oct. 2020), 25, https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_romania_en.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Romania	1.025	3,20%	1.567	1,03%	€ 288	0,48%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
924	114	74	11

Figure 4.2. Romania.1 – Horizon 2020 performance analysis.

Referring to the first assumption Romania has lower values for all the indicators in comparison to EU average and is labeled as modest innovator. Regarding the second assumption Romania has a top publication rate of 4,6% which is two times lower than the EU average and is ranked 28 out of 28 UE Member States in terms of Researchers ratio. Concerning the third assumption the total number of eligible proposals for Romania is 7.651 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

As stated in the performance table Romania signed 1.025 Horizon 2020 grant agreements (3,20% of EU total) out of 6.229 approved at EU13 level (19,43% of EU total) and 32.064 at the level of the whole EU. There are 1.567 Romanian organizations (1,03% of EU total) participating in the Horizon 2020 projects. Romania receive EUR 288 million (0,48% of the total amount of FP8).

Relevant Stakeholders

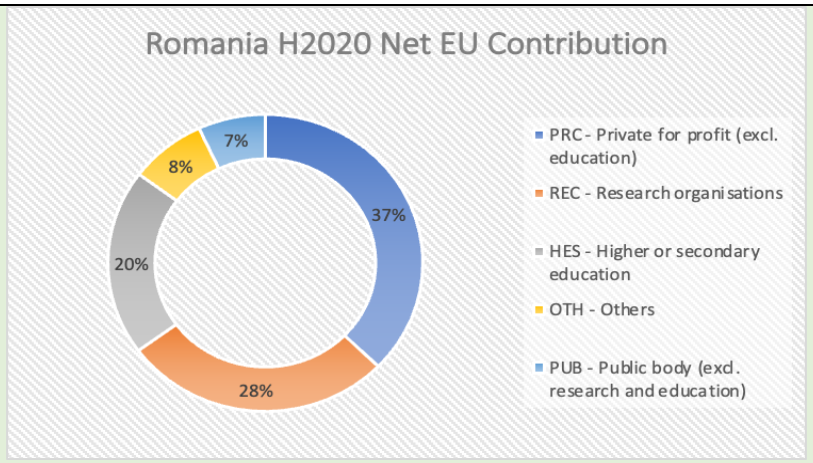

Figure 4.2. Romania .2 – Types of organisations based on net EU contributions.

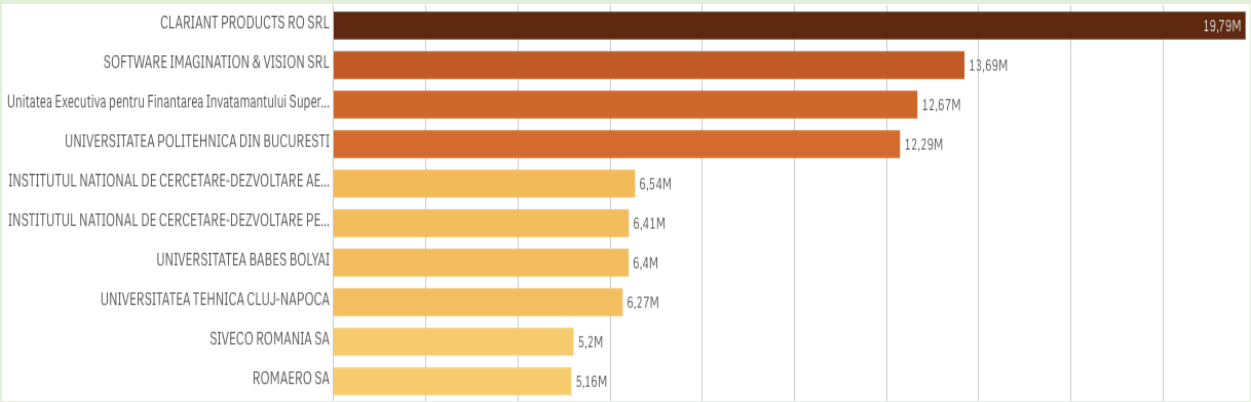

Figure 4.2.Romania.3 – Ten highest- RTOs by net Horizon 2020 contributions (mil. EUR).

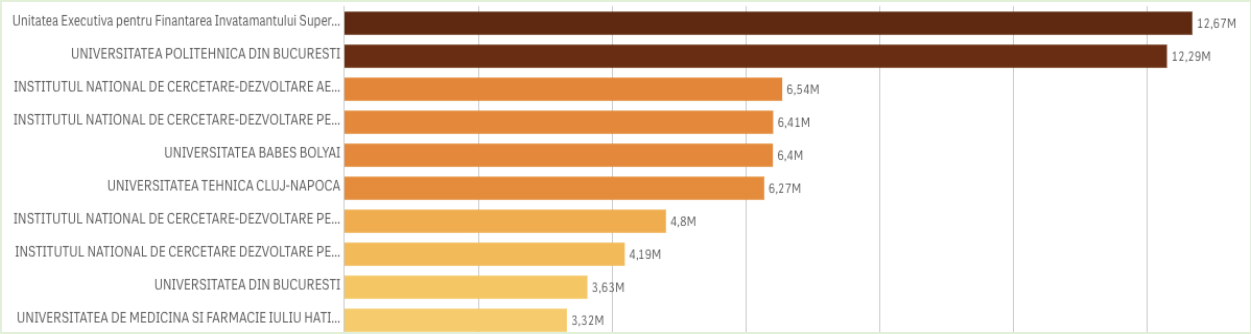

Figure 4.2.Romania.4 – Ten highest-ranking research organisations by net Horizon 2020 contributions (mil. EUR).

Romania receives EUR 288,7 million net contribution (0,43%) from H2020. The highest portion of this grant (37%) is devoted to the private for-profit sector. 28% of the grant is assigned to research organizations and only 20% of the grant is devoted to the education sector. Among the educational and research organizations the highest segment is allocated to **Unitatea Executiva Pentru Finantarea Invatamantului Superior[96].** The second highest portion (EUR 12,29 million) is devoted to **Universitatea Politehnica Din Bucuresti[97].** Overall, within the first ten H2020 beneficiaries there are 6 RTOs.

The table below lists other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects.

RTO	Number of SC3 projects
Unitatea Executiva Pentru Finantarea Invatamantului Superior, A Cercetarii, Dezvoltarii Si Inovarii https://uefiscdi.gov.ro/	7
Autoritatea Nationala De Reglementare In Domeniul Energiei / Romanian Energy Regulatory Authority (ANRE) https://www.anre.ro/	5
Centrul Pentru Promovarea Energiei Curate Si Eficienta In Romania Enero https://www.enero.ro/	5
Institutul National De Cercetare-Dezvoltare In Constructii Urbanism Si Dezvoltare Teritoriala Durabila Urban-Incerc https://www.incd.ro/	3

Figure 4.2. Romania.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

Romania has expressed no reasons for its lower performance in Horizon 2020 during the webinar.

[96] *Unitatea Executiva Pentru Finantarea Invatamantului Superior*, https://uefiscdi.gov.ro/.
[97] *Universitatea Politehnica Din Bucuresti*, https://upb.ro/.

Slovakia

Slovakia is part of the Implementation Working Groups on Batteries and Energy efficiency in industry.

The Commission's assessments of Slovakian NECP maintains that, although the document refers to Slovakia's participation in the SET Plan, "it does not allocate funding programmes under each implementation plan and fails to explain how the SET plan contributes to reach the national energy and climate objectives".[98]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Slovakia	0,88%	0,48%	31,4%	Moderate innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Slovakia	5,7%	21 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Slovakia	1,37%	3.542
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[98] *Assessment of the final national energy and climate plan of Slovakia* (European Commission, Oct. 2020), 10, https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_slovakia_en.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Slovakia	502	1,57%	678	0,45%	€ 136	0,23%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
472	47	48	0

Figure 4.2. Slovakia.1 – Horizon 2020 performance analysis.

In reference to the first assumption Slovakia has a lower value for all the indicators apart from the private R&D and intensity which is 0,48% while the EU average is 0,40%. As most other EU13 countries Slovakia is considered as moderate innovator. Concerning the second assumption Slovakia top cited publication rate is 5,7% lower than the EU average (11,11%) and is ranked 21st in the 28 UE Member States in terms of Researchers ratio. Referring to third assumption the value for total eligible proposals of Slovakia is 3.542 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

Overall Slovakia signed 502 Horizon 2020 grant agreements (1,57% of EU total) and 678 Slovakian organizations (0,45% of EU total) are involved in the Horizon 2020 projects. Slovakia receives EUR 136 million (0,23% of the total amount of FP8) vs an aggregate value of EUR 3 470 million (5,82%) for the EU13 cluster and EUR 56 120 million (94,18%) for the EU15 cluster.

Relevant Stakeholders

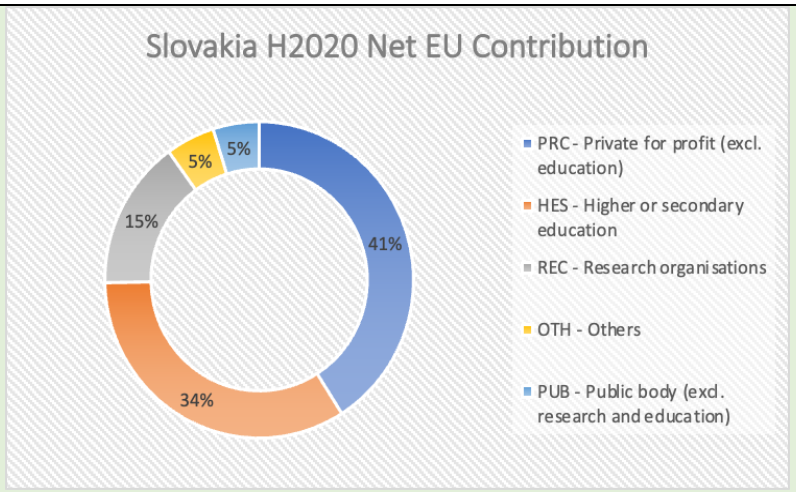

Figure 4.2. Slovakia .2 – Types of organisations based on net EU contributions.

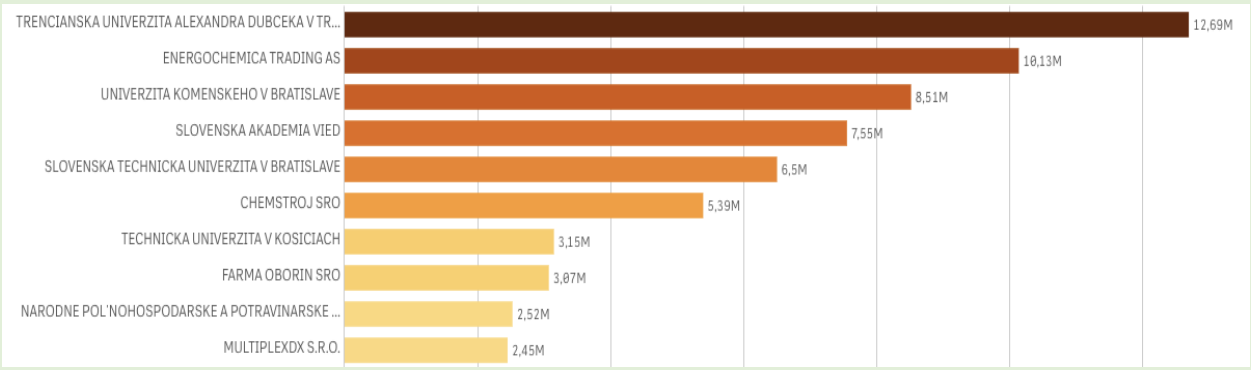

Figure 4.2.Slovakia.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

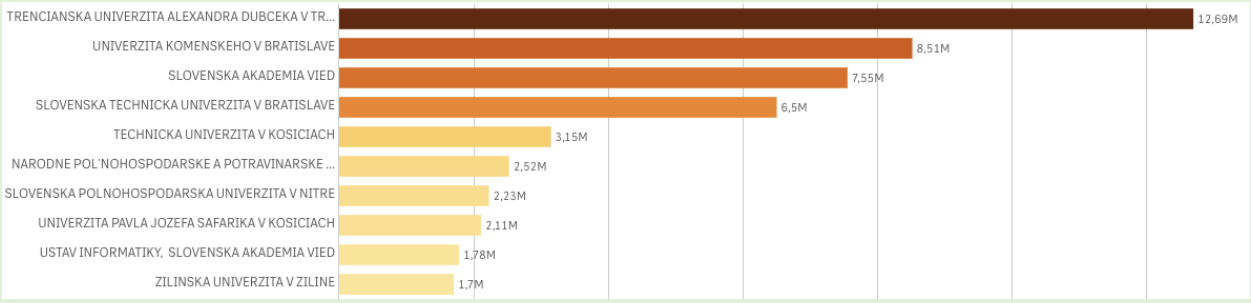

Figure 4.2.Slovakia.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Slovakia receives EUR 136 million net contribution (0,20%) from H2020 and is considered as one of the countries receiving the lowest amount. The highest segment of this grant (41%) is allocated to the private for-profit sector. Respectively 34% of the grant is allocated to education and only 15% of the grant is allocated to research organizations which is relatively low. Among the organizations, the first ranking beneficiary is the educational organization **Trencianska Univerzita Alexandra Dubceka** followed by **Energocheica Trading AS** in the second place. Among the educational and research organization two research organizations that receive a relatively high amount of the grant are the **Slovak Academy of Sciences** (Slovenská akadémia vied, or SAV)[99] and **Univerzita Komenskeho V Brtatislave[100].** Overall, within the first ten H2020 beneficiaries there are 6 RTOs.

The following table lists other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects.

RTO	Number of SC3 projects
Slovenska Inovacna A Energeticka Agentura / The Slovak Innovation and Energy Agency https://www.siea.sk/	7
Technicky A Skusobny Ustav Stavebny N.O. https://www.tsus.sk/	3
Statny Geologicky Ustav Dionyza Stura https://www.geology.sk	2

Figure 4.2. Slovakia.5 – Relevant RTOs participating in H2020 SC3 projects.

[99] *Slovak Academy of Sciences*, https://www.sav.sk/?lang=en.
[100] *Univerzita Komenskeho V Brtatislave*, https://uniba.sk/.

Reasons for H2020 lower performance according to the NCPs

Different possible reasons have been indicated by the Slovakia NCPs. Below is the summary.

1. Experience in writing quality proposals, bureaucracy associated with submitting a project proposal, and reporting have been confirmed as a reason for lower success rate in H2020 by the Slovakian NCPs. This is aligned with the second assumption described in this deliverable.
2. Lack of strong international connections and professional network has been the other reason stated by the NCP.

Slovenia

Slovenia belongs to the Implementation Working Groups on Batteries and Nuclear Safety.

The EU Commission's assessment of Slovenia's NECP claims that even if the plan mentions cooperation to the SET Plan to a certain extent, it does not commit to any specific IWGs. Moreover, "national funds are not allocated under each innovation platform, and the plan does not explain how the strategic energy technology plan would contribute to the achievement of Slovenia's energy and climate objectives".[101]

Horizon 2020 performance analysis

1st assumption: relative weakness of the R&I systems of EU13 vs EU15

Sample	Total R&D Intensity	Private R&D Intensity	Knowledge-intensive employment	Innovation performance
Slovenia	1,86%	1,39%	34,5%	Moderate Innovator
EU average	2,10%	0,40%	36,10%	

2nd assumption: relative lack of scientific excellence in institutions from EU13 vs EU15

Sample	Top-cited publications rate	Researchers ratio ranking
Slovenia	8,4%	9 out of 28 EU MSs
EU average	11,11%	

3rd assumption: relative lower quality of proposals with EU13 participants vs those that do not

Sample	Eligible proposals (percentage of EU total)	Total eligible proposals
Slovenia	2,95%	7.637
EU total	100,00%	259.169
EU13 total	20,97%	54.344
EU15 total	92,57%	293.903

[101] Assessment of the final national energy and climate plan of Slovenia (European Commission, Oct. 2020), 12, https://ec.europa.eu/energy/sites/default/files/documents/staff_working_document_assessment_necp_slovenia_en.pdf.

H2020 performance

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Slovenia	990	3,09%	1.439	0,95%	€ 372	0,63%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

H2020 retained proposals

Retained Proposals	Retained proposals – Cluster 3 only (Secure, clean and efficient energy)	Retained proposals – Marie Skłodowska-Curie Actions only	Retained proposals – European Research Council only
903	109	103	7

Figure 4.2. Slovenia.1 – Horizon 2020 performance analysis.

Considering the first assumption, Slovenia has lower values than the EU average except for the private R&D intensity (1,39%) while the EU average is 0.40%. Slovenia is considered as moderate innovator in the European Innovation Scoreboard. Regarding the second assumption Slovenia has a publication rate of 8,4% which is lower than EU average and thus is ranked 9 out of 28 UE Member States in terms of Researchers ratio (i.e., Researchers per Thousand Employment). Referring to the third assumption the total number of eligible proposals for Slovenia is 7.637 out of a total of 54.344 at the EU13 level and 259.169 at the EU28 level.

As indicated in the performance table Slovenia signed 990 Horizon 2020 grant agreements (3,09% of EU total) out of 6.229 approved at EU13 level (19,43% of EU total) and 32.064 at the level of the whole EU. Approximately 1.439 Slovenian organizations (0,95% of EU total) participate in the Horizon 2020 projects. Slovenia receives EUR 372 million (0,63% of the total amount of FP8) vs an aggregate value of EUR 3 470 million (5,82%) for the EU13 cluster and EUR 56 120 million (94,18%) for the EU15 cluster.

Relevant Stakeholders

For the Slovenia the **Ministry of Infrastructure** is the national entity responsible for energy matters,[102] while the **Ministry of Economic Development and Technology (MIZŠ)** is responsible for Horizon Europe.[103]

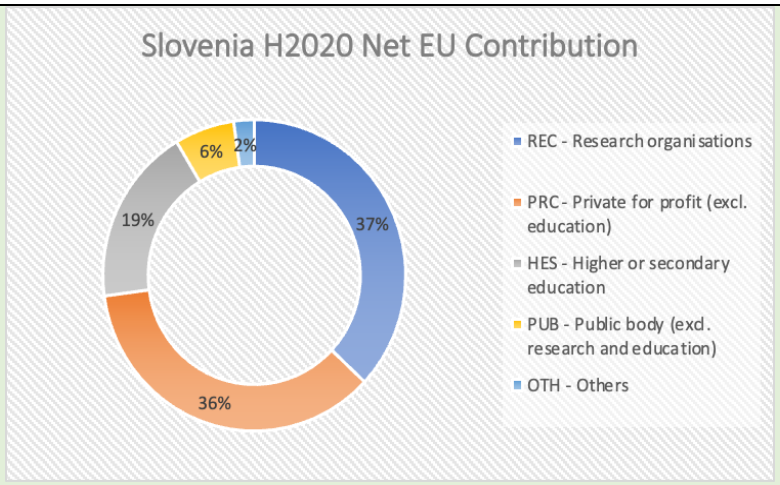

Figure 4.2. Slovenia .2 – Types of organisations based on net EU contributions.

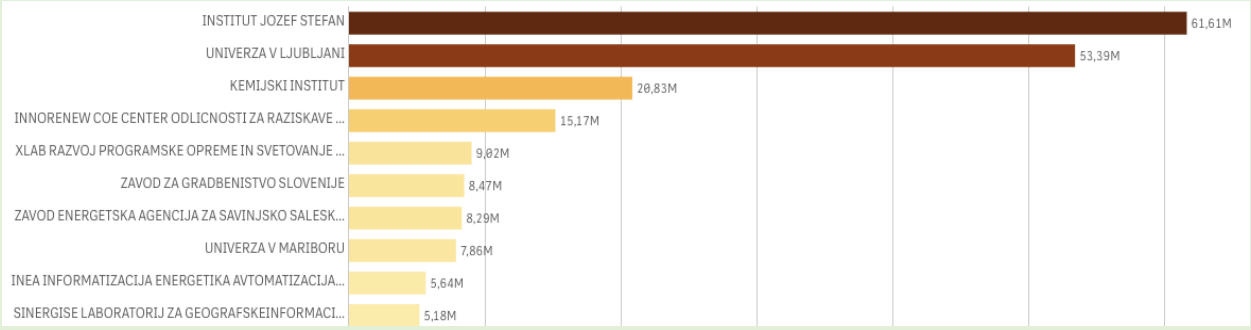

Figure 4.2.Slovenia.3 – Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR).

[102] *Ministry of Infrastructure*, https://www.gov.si/drzavni-organi/ministrstva/ministrstvo-za-infrastrukturo/.
[103] *Ministry of Economic Development and Technology (MIZŠ)*, https://www.gov.si/drzavni-organi/ministrstva/ministrstvo-za-gospodarski-razvoj-in-tehnologijo/.

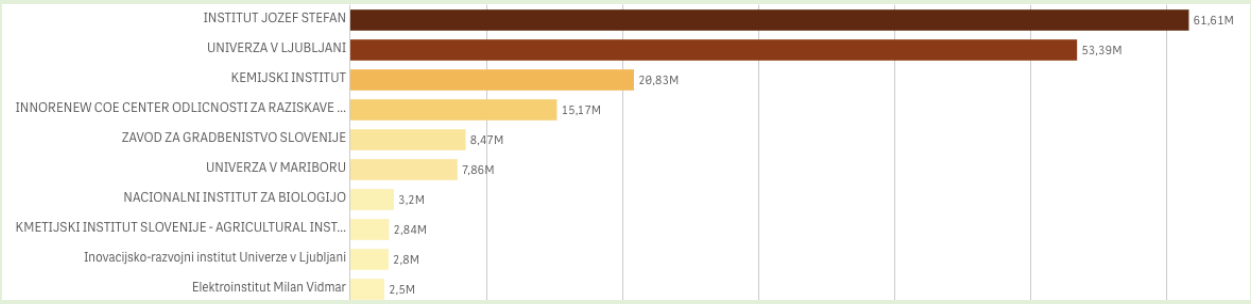

Figure 4.2.Slovenia.4 – Ten highest-ranking RTOs by net Horizon 2020 contributions (mil. EUR).

Slovenia receives EUR 372,6 million net contribution (0,56% of EU net contribution) from H2020 in which the highest segment is allocated to research organizations (37%) and only 19% of the net contribution is assigned to educational sector. Among the organizations, the research **Institute Jozef Steffan**[104] receives the highest amount of the net contribution followed by the **Univerza Vljubljani**[105] in the second place and **Kemijski Institut**[106] in the third place. Overall, within the first ten H2020 beneficiaries there are 5 RTOs.

In the below are other relevant RTOs participating in Horizon 2020 Societal Challenges 3 - Secure, Clean and efficient energy projects.

RTO	Number of SC3 projects
Institut Jozef Stefan https://www.ijs.si/ijsw	19
Elektroinstitut Milan Vidmar https://www.eimv.si/	4
Kemijski Institut / National Institute of Chemistry https://www.ki.si/	3

Figure 4.2. Slovenia.5 – Relevant RTOs participating in H2020 SC3 projects.

Reasons for H2020 lower performance according to the NCPs

Slovenia did not share any motivations to explain its low performance in Horizon 2020.

[104] *Institute Jozef Steffan*, https://ijs.si/ijsw.
[105] *Univerza Vljubljani*, https://www.uni-lj.si/.
[106] *Kemijski Institut*, https://www.ki.si/en/.

V FINDINGS AND PRELIMINARY RECOMMENDATIONS

5.1 Main findings

From the analysis carried out under this task, it emerged clearly that most of the EU13 countries indicated in their publicly available materials the collaboration with the SET Plan, as one of the tools for reaching 2030 and 2050 climate goals. The extend of respective involvement varies from country to country, but what is common to all analysed contexts is a rather limited participation in the activities of the SET Plan itself. The examination of their NECPs shows that some National Plans, e.g., Malta's, do not mention any contribution to the SET Plan. Other NECPs, for instance, the Slovak, indicate participation in the SET Plan, but do not specify mechanisms nor instruments how the targets of the SET Plan should be reached and how those would eventually contribute to the national energy and climate objectives. In general, most EU13 countries fail to give a detailed description of their actions and contribution to the SET Plan in their NECPs or in other available official communications.

Lack of the stronger commitment to the SET Plan reflects automatically in the EU13 countries' participation and performance in the H2020, including Cluster 3 - Secure, clean and efficient energy. In this report, single state's participation in the Programme has been assessed for three interdependent assumptions. Each assumption has various indicators that evaluate the performance of each country vis-à-vis EU average or cumulative values for the whole EU and EU13 and EU15 clusters. The analysis proved that, in general, EU13 countries showed relative weaknesses for the three assumptions, such as their research and innovation systems, lack of scientific excellence, and lower quality of proposals. The analysis revealed a strong correlation between low scores in all indicators here examined and Horizon 2020 performance. Moreover, countries with low scores tend to have less retained proposals in scientific domains, i.e., Horizon 2020 Cluster 3 (Secure, Clean and efficient energy), Marie Skłodowska-Curie Actions, and European Research Council.

Among all analysed EU13 countries, Malta receives the lowest net contribution (EUR 36,79 million) from Horizon 2020 and is placed at the bottom of the list, while Poland receives the highest contribution (EUR 713,12 million). For comparison, among the EU15 countries, Germany receives the highest contribution of EUR 9 600 million and Luxembourg is the country receiving the lowest share from Horizon 2020 (EUR 189 million). The figures indicates that there is a huge gap between EU13 countries and EU15 countries in terms of Horizon 2020 participation.

The three-hypothesis, i.e., reasons hindering the EU13 countries' participation in the H2020, were directly confirmed by the NCPs from Croatia, Latvia, Cyprus, and Slovakia, during the webinar organised at the beginning June 2021.

In addition to the three hypotheses, several other reasons supporting the lower performance of EU13 countries have been indicted by the NCPs. The following is a summary of the key reasons.

- Slovakia, Hungary, and Czech Republic NCPs indicated the lack of experience and complexity of Horizon 2020 as a reason for lower participation in the Framework Programme.
- Poland, Slovakia, Malta, Hungary, and Cyprus stated lack of international network and regional corporation as a reason for low participation.
- Croatia and Slovakia stated lack of incentive as a reason for low performance.
- Ease of alternative source of funding, difficulties in administrative procedure, extremely high competition, and low success rate were the other reason stated by the NCPs for lower participation in Horizon 2020.

5.2 Preliminary recommendations

In this section the SUPEERA teams tries to provide a list of very preliminary recommendations on how to strengthen EU13 participation in EU low-carbon energy policies and corresponding funding schemes particular in Horizon Europe. This set of recommendations is based on the analysis carried out, including both quantitative (e.g., number of projects, RTOs involves, amount of grants received) and qualitative data (e.g., feedbacks received directly from EU13 NCPs).

A revised and improved version of these recommendations will be provided in the updated version of this report foreseen by the end of Y2. In particular, the goal is to organise a series of physical workshops in several EU13 countries which will allow the integration of country specific aspects.

Most of the following recommendations are interconnected and interdependent but are also meant to be applied separately. Moreover, given the heterogeneity of the EU13 cluster, some of them are more relevant for some of these countries but not others.

1. Link national R&I priorities to European ones

EU13 should align their national priorities in terms of R&I with those at the EU level. Enhancing their participation in the SET Plan through selected Implementation Plans would be pivotal to get involved in the wider EU discourse pertaining to research in energy technologies and understand current priorities, other than enhancing international ties, sharing research infrastructures and profit from all the other opportunities arising from participating in the SET Plan.

2. Strengthen participation in EU R&I networks

EU13 would benefit from being involved in R&I European communities and networks to bring their national priorities closer to the EU one and, at the same time, to have a say over and contribute

giving shape to the latter. Among such communities and networks, a pivotal role is played by those related to the SET Plan implementation landscape – and hence in these EU13 should focus more, such as ETIPs, EERA Joint Programmes, ERA-Net Cofund schemes, Coordination and Support Actions (CSA) and industrial associations.

3. Increase R&I funding

The analysis showed a clear correlation between the low quality of national R&I systems and scientific institutions and poor performance in Horizon 2020 – an issue confirmed by the NCPs of Croatia, Cyprus, Latvia and Malta. EU13 should invest more in R&I to narrow their gap with EU15. They should reverse the trend of austerity and financial cuts that hit their R&I structures beginning with the 2008-2009 financial crisis.

It is also necessary to make R&I systems more competitive to engage successfully EU15 – an issue raised by Slovakian NCPs. For most of the current Horizon 2020 research grants, salaries in public research institutions are fixed and linked to civil servants' wages, which in EU13 countries are far below the average pay for a scientist in Western Europe. These salaries should instead be left free to fluctuate.[107]

4. Foster stronger academia-business cooperation

Several NCPs (Cyprus, Latvia, Malta and Slovakia) pointed to the shape of their economies, the relative limited industry sector, and the absence of integration between business and academia as one of the main causes for their limited participation in Horizon 2020. EU13 should strengthen this connection, tracing a stronger link between universities and industry, accelerate uptake by industry and translate research into concrete business opportunities.

5. Improve administrative procedures and reduce administrative barriers

The third assumption demonstrated that, overall, the eligibility rate – i.e., the number of proposals that have not failed at the eligibility or admissibility step – is lower in EU13 countries as compared to EU15. This outcome has been confirmed by Croatia, Malta ad Slovakia NCPs. EU13 countries should improve the administrative expertise of institutions applying for Framework Programme grants by creating national bodies providing administrative assistance to applying institutions. Moreover, during the Widening Session of EERA's Summer Strategy Meeting 2020, several countries pointed to the administrative and regulatory burdens that impinge on R&I in these countries. These bureaucratic procedures should be shortened and simplified so as to also ease of tracing international connections and participating in EU structures such as the SET Plan.

[107] Florin Zubașcu, *Newer member states facing conundrum in extracting value from Horizon Europe* (Science Business, May 2021), https://sciencebusiness.net/news/newer-member-states-facing-conundrum-extracting-value-horizon-europe.

6. Enhance the activities of National Contact Points

National Contact Points should be reformed, from information-providing bodies to promoters of excellence and internationalisation, providing assistance and support with proposals submissions. In view of the launch of the new Horizon Europe programme, some countries (e.g., Lithuania) restyled their NCPs completely, increased their ties at the European level and put in place a more informative communications strategy to both advertise the work of these institutions and share information and expertise related with Horizon Europe. NCPs could also serve as providers of administrative assistance to applying institutions and promoters of the opportunities arising from FP to academia.

VI MAIN ACTIVITIES CARRIED OUT INVOLVING EXTERNAL STAKEHOLDERS (as of June 2021)

6.1 EERA's Summer Stategy Meeting 2020 – Widening Session

2020 EERA's Summer Strategy Meeting hosted an invitation-only session, under the SUPEERA project, that focused in sharing best practices between non-EERA EU13 stakeholders and key EERA members.

The meeting, **Strengthening your participation in EU Clean Energy Transition**, gathered approximately 40 participants affiliated to research centres and universities from several EU13 countries, such as Croatia, Latvia, Czech Republic, Slovenia, Estonia, Romania and Poland, among others.

However, and given the low participation of EU13 countries, the question that remains to be answered is how to bring closer research institutions to the SET Plan. The SUPEERA project sets out to work towards addressing this.

Sharing best practices between EU13 stakeholders and key EERA members

This section aimed at facilitating the development of long-lasting interactions, collaborations schemes, and partnership arrangements with the identified stakeholders from EU13 and key EERA members by presenting the most relevant case studies in relation to:

- The participation in EU funded projects
- The potential platforms for common collaborations

To address this objective, SUPEERA invited BERA (The Belgian Energy Research Alliance), which shared with the participants the added value that being part of EERA has brought to them.

From the EU13 participants' point of view, FOSS Research Centre for Sustainable Energy - University of Cyprus (UCY) presented best practices that derived from participating in the SET Plan Implementation Working Groups and in the EERA community. He highlighted that the active involvement of FOSS, including EU funded projects such as PANTERA that aims at enhancing the collaboration in R&I activities in Europe, has been of strategic importance for a country like Cyprus.

Co-creating content for discussion and debate

The session continued with a co-creation activity where the EU13 participants were given the opportunity to share their own challenges and opportunities in terms of funding, cooperation, infrastructure and technology, as well as other factors not considered at the outset of this initiative.

Among the **challenges**, the participants emphasized:

- the regulatory and administrative burden that obstruct R&I in these countries;
- the importance on fossil fuels, specially coal, from an economic point of view which represents a challenge in the transition of these regions towards low-carbon economy;
- the organization's infrastructure which does not always match the requests to participate in cutting- edge demonstration projects and that calls for exploring alternatives to share research infrastructure and ways to complement research expertise across RTOs and universities.

As per the **opportunities**, the discussants underscored:

- the potential benefits that research centres could derived from accessing to co-funding mechanisms of regional, national and European programmes;
- aligning national R&I agendas with the European agenda to avoid duplication of efforts;
- embarking on smart specialisation strategies in order to address structural changes in coal intensive regions;
- supporting staff exchange to develop knowledge and skills.

In this context, being part of a harmonized community with a set of converging medium and long-term goals, such as EERA Joint Programmes, represents a feasible cooperation alternative as well as an opportunity to streamline national and European R&I agendas while opening a door to give way to most of the mapped out advantages of being part of a research community.

6.2 SUPEERA Webinar for EU13 – Strengthening your participation in EU Clean Energy Transition

Since the project activity also covers national structures giving support to research organisations related funding schemes (public institutional and competitive funding, administrative procedures, training etc.), in early June 2021, SUPEERA organized a dedicated webinar for the National Contact Points in EU13.

The webinar started with the introduction of the state of play of EU13's limited participation in the Horizon 2020 Framework Programme. It proceeded with a tour de table where participants were invited to showcase the three main reasons that, in their opinion, account for this lower level of participation of their respective country. NCPs were also invited to share relevant best practices and experiences.

For instance, Poland enumerated several winning approaches to enhance performance in the Framework Programme. Among these are increasing visibility (especially at the international level), being unique i.e., finding the right market niche, positioning as a reliable and efficient partner in consortia, and developing a long-term R&I strategy to proactively increase involvement in the Framework Programme.

In the following section of the webinar, we provided an update on the SET Plan, the Clean Energy Transition and the main funding opportunities and the related role of the EERA network. Lastly, we set a collaboration to organise events in EU13 respective countries.

VII CONCLUSION AND WAY FORWARD

For a successful implementation of the SET Plan and its targets in the broader context of the Clean Energy Transition it is essential to spread research excellence across the entire EU, with specific focus to the EU13 countries. On a long term in fact, the relatively weak position of the EU13 in R&I programmes poses a concrete risk that the 2030 and 2050 targets will not met, while, on a short term, identified limited participation might be reproduced also in the Horizon Europe, thereby broadening even more the disparities among EU27 RTOs.

Based on a set of available data - extracted mainly from newly restructured CORDIS database and other available resources (policy briefs, EU parliament studies, etc.) - the present deliverable opens with an in-depth analysis of the main reasons for the EU13's under-performance in H2020 to conclude eventually with the identification of a set of preliminary recommendations on how to improve their participation in future R&I EU activities. More specifically, the following activities have been carried out: an exhaustive desk research of the EU13's involvement in the SET Plan complemented with the organisation of two webinars aimed at discussing the reasons of their low

participation in funding schemes; a state of play of the SET Plan as a platform contributing to the realisation of the Clean Energy Transition and the role of the EERA network therein; an analysis of the performance of the EU13 countries in the Horizon 2020 Framework Programme based on three assumptions and related indicators. Although foreseen by the DoA, a series of physical workshops in several EU13 countries could not be organised due to the Corona-19 crisis which, as a consequence, hindered the possibility to correlate current recommendations with a country specific analysis on national public research resources.

The current deliverable will be updated in M24 and will be released in its final version in M42. In order to further improve its content and to fine tune the recommendations by listing key issues of further engagement of EU13 in the SET Plan and their positioning towards the Clean Energy Transition, including respective funding schemes, SUPEERA will undertake the following steps:

- Continue and deepen the assessment of the main reasons why participation of the EU13 in the SET Plan is low by means of desk research;

- Organise by the end of 2021 two webinars dedicated to selected RTOs from EU13 countries. The main purpose of the former will be to give a detailed overview of the SET Plan and the revision of respective IPs, while the latter will introduce the main instruments (HEU, CET Partnership, EEA funding schemes, etc.) that can support their participation in the SET Plan. In addition, the two webinars will serve as an introduction to the physical workshops;

- Organise dedicated workshops in EU13 countries. Despite the pandemic, which heavily affected this activity, the intention remains to have at least 8 physical workshops (based on geographical clustering). Whenever possible, these workshops will be organised in collaboration with existing initiatives (project PANTERA for example) and/or in coordination with national key stakeholders (for example as a side event to national open/info R&I days);

- Continue the coordinate with respective NCPs (and other relevant bodies);

- Foster best-practices sharing by organising high-level meetings between key EERA members and non-EERA EU 13 stakeholders and by doing so facilitate their engagement in the Clean Energy Transition process.