European Commission

Partnership Evaluation Report: **Towards zero emission road transport (2Zero)**

Horizon Europe and the Green Transition
Interim evaluation support study

Independent Expert Report

Research and Innovation

Partnership Evaluation Report: Towards zero emission road transport (2Zero)

European Commission
Directorate-General for Research and Innovation
Directorate C — Clean Planet
Unit C.1 — Strategy, policy coordination & urban transitions
Contact Thomas Schubert (DG RTD), Veera Natunen (DG RTD)
Email Thomas.SCHUBERT@ec.europa.eu
RTD-G2-SUPPORT@ec.europa.eu
RTD-PUBLICATIONS@ec.europa.eu
European Commission
B-1049 Brussels

Manuscript completed in June 2024

PDF	ISBN 978-92-68-21556-2	doi:10.2777/2828415	KI-01-24-052-EN-N

Luxembourg: Publications Office of the European Union, 2024

EUROPEAN COMMISSION

Partnership Evaluation Report: Towards zero emission road transport (2Zero)

Horizon Europe and the Green Transition
Interim evaluation support study

Christiane Kerlen, Kerlen Evaluation

2024 Directorate-General for Research and Innovation EN

Table of contents

1. Introduction 8
2. Background of 2Zero 8
3. Implementation state of play 9
4. Findings 10
4.1. Relevance 10
4.2. Coherence 11
4.3. Efficiency 12
4.4. Effectiveness 13
4.5. EU added value 14
4.6. Additionality 14
4.7. Directionality 15
4.8. International positioning and visibility 15
4.9. Transparency & Openness 16
4.10. Phasing out preparedness 16
5. Conclusions 16
6. Lessons Learned & Recommendations 17
7. Sources 17
8. Annex 18
8.1. Supplementary evidence: Background to the initiative 18
8.2. Supplementary evidence: Implementation state of play 22
8.3. Supplementary evidence: Results 28

Index of figures

Figure 1: Number and geographical coverage of partners in 2Zero across Europe in 2022 18

Figure 2: 2Zero members per type 19

Figure 3: 2ZERO governance structure 20

Figure 4: 2Zero partnership specific impact pathways 21

Figure 5: 2Zero's key performance indicators 22

Figure 6: Share (%) of participations by type of action/instruments. 25

Figure 7: Network of participating countries in 2Zero 27

Figure 8: Policy-related, and altmetrics mentions profiles, Societal Challenge “Smart, Green And Integrated Transport” cPPP and article 187 partnerships, (2014-2021)..... 30

Figure 9: Pre- Horizon Europe track record of 2Zero researchers on selected dimensions of diversity and societal readiness of research teams (2017-2021)..... 32

Figure 10: Pre- Horizon Europe track record of 2Zero researchers on citation impact (2017-2021) 33

Figure 11: Pre- Horizon Europe track record of 2Zero researchers on selected online dissemination dimensions (2017-2021)..... 34

Figure 12: Pre- Horizon Europe track record of 2Zero researchers on OA publishing (2017-2021) 34

Figure 13: In which Horizon Europe country is the organisation that you represent located? 36

Figure 14: Would you agree or disagree with the following statements about the administrative and management processes in your Horizon Europe project? (2Zero)..... 37

Figure 15: Q7: Would you agree or disagree with the following statements about the administrative and management processes in your HE project? (Cluster 5 in total)..... 38

Figure 16: To what extent do you agree with the following statements about the effort needed to prepare and submit your Horizon Europe project? (2Zero)..... 38

Figure 17: Q9: Would you agree or disagree with the following statements about the effort needed to prepare and submit your HE project? (successful projects, Cluster 5 in total)..... 39

Figure 18: To what extent do you agree or disagree with the following statements about the effort needed to prepare and submit your HE project? (unsuccessful projects, Cluster 5 in total) 39

Figure 19: In your estimation, what is the percentage share of your Horizon Europe project budget that is spent on administrative tasks (e.g. project reporting, project financial management, and similar)? (2Zero) 40

Figure 20: Q12: In your estimation, what is the percentage share of your HE project that is spent on administrative tasks? (Cluster 5 in Total)..... 40

Figure 21: Before your current Horizon Europe project, have you personally participated/coordinated previous Framework Programme (Horizon 2020) project(s)? (2Zero)..... 41

Figure 22: Before your HE project, have you participated/coordinated previous Framework Programme (Horizon 2020) project(s)? (successful projects) (Cluster 5 in total)..... 41

Figure 23: Before your HE project, have you applied for previous Framework Programme (Horizon 2020) project(s)? (Unsuccessful projects, Cluster 5 in total)..... 42

Figure 24: Have you applied for any additional funding for the research idea/activities addressed in your Horizon Europe project? (2Zero)..... 42

Figure 25: Have you applied for any additional funding for the research idea/activities addressed in your HE project? (Cluster 5 in total) 43

Figure 26: Are there any activities planned in your project that are implemented in collaboration with projects funded under other Horizon Europe programmes or clusters (this could include mutual conferences, joint dissemination activities, workshops, joint publications, etc.)? If yes, please indicate the three most important programmes. (2Zero) 43

Figure 27: Are there any activities planned in your project that are implemented in collaboration with projects under other HE programmes or clusters (this could include mutual conferences, joint dissemination activities, workshops, joint publications, etc.). If yes, please indicate the three most important programmes? (Cluster 5 in total) 44

Figure 28: Is your Horizon Europe project a continuation of research activities carried out under previous Framework programmes/other funding schemes? (in terms of being based on the work carried out in the past research project). If yes, please specify which programme. (2Zero) 45

Figure 29: Is your HE project a continuation of research activities carried out under previous Framework programmes/other funding schemes? (in terms of being based on the work carried out in the past research project). If yes, please specify the programme. (Cluster 5 in total) 46

Figure 30: To what extent does your Horizon Europe project respond to the following needs of your organisation? (2Zero) 46

Figure 31: Q24 To what extent does your HE project respond to the following needs of your organisation? (successful applicants, Cluster 5 in total) 47

Figure 32: To what extent does your HE project respond to the following needs of your organisation? (unsuccessful applicants, Cluster 5 in total) 48

Figure 33: Please indicate which of the following outputs have been produced/are likely to result from your Horizon Europe project (please select all applicable answers): (2Zero) 49

Figure 34: Q26 Please indicate which of the following outputs have been produced/are likely to result from your HE project? (Cluster 5 in total) 50

Figure 35: To what extent, if at all, has your Horizon Europe project achieved/is likely to achieve the following results:(2Zero) 51

Figure 36: Q30 To which extent, if at all, has your HE project achieved/is likely to achieve the following results? (Cluster 5 in total) 51

Figure 37: To what extent have the following barriers constituted challenges when carrying out your project? (2Zero) 52

Figure 38; To what extent have the following barriers constituted challenges when carrying out your project? (Cluster 5 in total) 53

Figure 39: Are there any exploitation activities (e.g., using project results for commercial purposes, to tackle societal problems or in policymaking) foreseen as a part of your project? Please select the relevant types of exploitation activities foreseen: (2Zero) 54

Figure 40 Q42: Are there any exploitation activities foreseen as a part of your project? Please select the relevant types of exploitation activities foreseen: (Cluster 5 in total) 54

Figure 41: Would you agree or disagree that, compared to the research funding available to you at national and/or regional level, Horizon Europe: (2Zero) 55

Figure 42: Q48 Would you agree or disagree that, compared to the research funding available to you on national and/or regional level, HE: (Cluster 5 in total) 56

Index of tables

Table 1: 2Zero Calls 23

Table 2: Type of organisations in 2Zero 24

Table 3: Type of actions/instruments (grouped) in 2Zero 25

Table 4 Group of countries of 2Zero 26

Table 5: Top countries (of supported organisations) in 2Zero 26

Table 6: Female participation in partnerships 28

Table 7: Horizon Europe: Leverage factor of partnership projects 56

Key definitions, acronyms and glossary

ALICE	Alliance for Logistics Innovation trough Collaboration in Europe
BEV	Battery Electric Vehicles
Batteries Europe	European Technology & Innovation Platform on batteries
BMR	Biennial Monitoring Report
CEF	Connecting Europe Facility
CINEA	European Climate, Infrastructure and Environment Executive Agency
CSA	Coordination and Support Action
DEP	Digital Europe Programme
DG	Directorate-General
EGCI	European Green Cars Initiative
EGVI	European Green Vehicles Initiative
EGVIAfor2Zero	European Green Vehicles Initiative Association for the 2Zero partnership
EIB	European Investment Bank
EPoSS	European Technology Platform on Smart Systems Integration
ERTRAC	European Road Transport Research Advisory Council
ETIP	European Technology and Innovation Platform
ETP	European Technology Platform
EU	European Union
FCEV	Fuel Cell Electric Vehicles
H2020	Horizon 2020
HE	Horizon Europe
IA	Innovation Action
KIP	Key Impact Pathway
LERU	League of European Research Universities
LIFE	LIFE-Programme for Environment and Climate Action

PPP	Public-Private Partnership
R&I	Research and Innovation
RIA	Research and Innovation Action
RTR Conference	Conference on Results from Road Transport Research
SDG	Sustainable Development Goals
SNET	Smart Networks for Energy Transition
SRG	States Representatives Group
SRIA	Strategic Research and Innovation Agenda
UK	United Kingdom

1. Introduction

This evaluation report on the 2Zero partnership is part of the interim evaluation of Horizon Europe (HE) activities related to a Green Transition. Its purpose is to provide evidence on the relevance, coherence, efficiency, effectiveness, EU added value, additionality, directionality, international positioning and visibility, transparency and openness as well as phasing out preparedness of the partnership. The assessment is based on a mixed-method approach of both quantitative and qualitative data analysis. The quantitative data analysis comprises an analysis of the project portfolio of the partnership based upon eCorda extraction from March 2023. The qualitative analysis comprises desk research activities and text analysis of the partnership strategic documents and existing monitoring, progress and evaluation reports publicly available and provided by the European Commission. In addition, five interviews were conducted with three representatives from the partnership and two representatives from the European Commission in order to gain additional insights and validate the findings of the analysis. The interviews followed a semi-structured, exploratory approach, based on guidelines referencing the evaluation questions in focus. The data collection process for the partnership evaluation incorporated information from both Horizon 2020 (H2020) and the initial phase of the partnerships in Horizon Europe. The primary data collection was concluded by July 2023. Supplementary data from the forthcoming Biannual Monitoring Report 2024 was incorporated in December 2023. Due to the short runtime of the Horizon Europe Partnerships, it is noteworthy to bear in mind that many of the partnerships' activities are still ongoing and have not yet been fully accomplished.

2. Background of 2Zero

2Zero is a co-programmed European public-private partnership which was established in 2021[1]. It is aiming at accelerating the transition towards zero tailpipe emission road mobility across Europe. Three to four rounds of biennial calls for proposals are expected to be launched within the 2Zero partnership in the period 2021-2027 with a foreseen budget of EUR 615 million within HE.

2Zero builds on the work of its predecessors, the European Green Cars Initiative (EGCI: 2009-2013) and the European Green Vehicles Initiative (EGVI: 2014-2020). EGCI was created in the 7th Framework Programme as part of the European Economic Recovery Plan in response to the global economic crisis of 2008. It focused on technologies and systems to achieve a road transport system using renewable energy sources in 3 areas: “Electrification of road transport”, “Long Distance Transport” and “Logistics and Co-Modality”. EGVI worked in continuation of EGCI aiming at accelerating research, development and demonstration of technologies allowing the efficient use of clean energies in road transport. Both partnerships contributed to preparing the ground for electrification when the industry was not yet fully committed to the technology. These partnerships also included significant funding for the development of an EU battery research development and production chain as well as the initial automated driving functions and can, therefore, be considered the precursors of the Batt4EU and CCAM partnerships.

2Zero is now building on the foundations of its predecessors, widening the perspective and taking a more systemic approach, linking the vehicle, the charging infrastructures and the (smart) grid. 2Zero focuses on research and innovation for the development of next-generation energy-efficient zero tailpipe emission road vehicles (both Battery Electric Vehicles and Fuel Cell Electric Vehicles, the latter limited to long-haul heavy-duty vehicles), mobility solutions, recharging infrastructures and their interaction with the grid. It also aims to accelerate the deployment of zero tailpipe emission vehicle technology through effective

[1] https://www.2zeroemission.eu/wp-content/uploads/2021/11/2Zero-Memorandum-of-Understanding-signed-1.pdf [19.05.2023]

mobility and logistics solutions for all applications. Due to the integrated system approach, the partnership's activities are designed to be transversal, allowing the consideration of different aspects of the challenges of the decarbonisation of road transport. Aspects addressed are technologies, process, operational and business model innovation, and circularity and life-cycle analysis.

As of mid-May 2023, the European Green Vehicles Initiative Association for the 2Zero partnership (EGVIAfor2Zero)[2] has 115 members[3]. The largest share of members is located in Germany (21%), followed by Spain (14%), Belgium (12%), France and Italy (11%) (see Annex 8.1.1). 2Zero is also drawing on the wide base of stakeholders of the European Technology and Innovation Platforms (ETIP), European Road Transport Research Advisory Council (ERTRAC), European Technology Platform on Smart Systems Integration (EPoSS), Smart Networks for Energy Transition (SNET), Alliance for Logistics Innovation trough Collaboration in Europe (ALICE) and European Technology & Innovation Platform on batteries (Batteries Europe), thus bringing together all relevant organisations dealing with research and development activities in the fields covered by the partnership. The governance structure of 2Zero is presented in Annex 8.1.2.

The specific objectives of 2Zero are outlined in the Strategic Research and Innovation Agenda[4]:

- Develop zero tailpipe emission, affordable user-centric solutions (technologies and services) for road-based mobility all across Europe and accelerate their acceptance to improve air quality in urban areas and beyond;

- Develop affordable, user-friendly charging infrastructure concepts and technologies that include vehicle and grid interaction;

- Demonstrate innovative use cases for the integration of zero tailpipe emission vehicles and infrastructure concepts for the road mobility of people and goods;

- Support the development of life-cycle analysis tools and skills for the effective design, assessment and deployment of innovative concepts in products/services in a circular economy context.

Annex 8.1.3 shows the partnership-specific impact pathway. The key performance indicators to measure expected outcomes are represented in Annex 8.1.4.

3. Implementation state of play

The Strategic Research and Innovation Agenda (SRIA) of the 2Zero partnership is the reference document for its implementation. The specific objectives outlined for the partnership are represented in four corresponding areas of R&I activities. After two work programmes were developed with the support of the SRIA inputs, it is being revised at the time of this evaluation. There have been 11 2Zero-specific calls until June 2023[5] and 3 joint calls with other partnerships (see Annex 8.2.1).

---

2 EGVIAfor2Zero is an international non-profit association engaged with the European Commission into the 2Zero partnership in order to represent the Partners other than the Union.

3 https://www.2zeroemission.eu/who-we-are/egviafor2zero/ [19.05.2023]

4 https://www.2zeroemission.eu/wp-content/uploads/2023/01/2Zero-SRIA-webversion-2022.pdf, p. 24 [19.05.2023]

5 Opening date of the first call was 24 June 2021.

The project portfolio of 2Zero underlying the following analysis (see Annex 8.2.2) comprises 20 projects. The current sum of EC's net contribution is EUR 188.9 million. This represents a share of about 30% of the dedicated budget.

A share of 59% of EC net contribution has been allocated to private companies, 17% to higher education institutions and 15% to research organisations. Compared with the overall figures in Cluster 5, the project portfolio of 2Zero has a higher share of participation of private companies (60% in the partnership vs. 44% in Cluster 5), indicating a particularly high involvement of industry.

The allocation of funding is almost evenly spread between Research and Innovation Actions (RIA) (49.4%) and Innovation Actions (IA) (48.7%). This indicates that the portfolio includes projects on higher TRL while not neglecting lower TRL research, as RIAs usually focus on lower TRL and IAs on higher TRL. In comparison, the share of EC contributions going to RIA in Cluster 5 is only 33.2% and to IA 62.4%. Looking at the share of participation across the different types of actions, it becomes clear that private companies engage most often in IAs (65%), while higher education establishments have the highest share in RIAs (23%).

Geographically, the eCorda statistics show that 2Zero is mainly concentrated in EU-14 countries, as they represent the main automotive clusters in the EU. 81.1% of the participations and 89.1% of EC contributions are shared among this group. In terms of participation pattern, Germany has the highest share of participation (14.6%) and EC contribution in total funding (14%), highlighting the strong automotive industry of this country. Belgium, Italy and Spain follow with shares of participation at 10%, 9.8% and 9.5% and shares of funding at 11%, 14% and 10% respectively. The network analysis based on the number of collaborations among organisations from each pair of countries in the projects included in this partnership portfolio shows a more even distribution with strong collaboration across the majority of countries in the EU (see Annex 8.2.2).

4. Findings

4.1. Relevance

Road transport contributes significantly to GHG-emissions and air pollutants. 2Zero, with its clear focus on zero tailpipe emissions and its system approach with dedicated activities for the integration in the grid circular economy as well as business model aspects and user perspectives, directly contributes to the Green Transition and is highly relevant to the EU Framework Programme for R&I. Battery electric powertrains will be the most important element for the decarbonisation of road transport[6] , and fuel cell hydrogen electric vehicles might also be an important option specifically for heavy-duty long-distance transport. Benefits will be created for all citizens by making road transport emission-free. With the R&I investments, the competitiveness of the automotive sector should be supported too.

The objectives of 2Zero are the result of an extensive consultation process taking into account changing framework conditions, market, and policy needs. The SRIA is being revised at the time of this evaluation, indicating the adaptability and flexibility of the partnership's approach.

Survey results show that 2Zero projects respond to the need of their organisation to reduce the environmental impact of their products, processes or services (67%, only 41% in Cluster

[6] To support climate neutrality goal by 2050, the CO2 emission target for both cars and vans wil be 0 g CO2/km in 2035, thus excluding the sale of new vehicles with Internal Combustion Engine.

5) and to develop sustainable solutions contributing to a green transition (72%, 68% in Cluster 5) (see Annex 8.3.3).

4.2. Coherence

The 2Zero partnership interacts and coordinates with other complementary partnerships and those addressing enabling technologies. The most important are the Batt4EU partnership, the Clean Hydrogen partnership, CCAM, the Key Digital Technologies partnership and Made in Europe. One of the ways of assuring coherence and synergies is overlapping membership, e.g. large companies like BMW are members of 2Zero as well as Clean Hydrogen, CCAM and Batt4EU, thus assuring that there is no duplication of activities. Another way is the conference on Results from Road Transport Research (RTR Conference), which is jointly organised by 2Zero, CCAM, ERTRAC and the European Commission, where project results, gaps and challenges are presented and discussed. A common office in Brussels, which 2Zero, CCAM and ERTRAC share, supports informal communication to share ideas and align activities. In 2021, 2Zero and Batt4EU were the first partnerships to have a joint call on the definition of life-cycle assessment methods of zero-emission road transport solutions.

2Zero also realises synergies with the Climate neutral and Smart-Cities Mission. 2Zero was the first to engage in a three-party joint call developed in 2023 on co-designing smart systems and services for user-centred shared zero-emission mobility of people and freight in urban areas. According to the partnership management there will be more joint topics in the future, leveraging synergies between partnerships and Missions.

European Technology Platforms play an essential role in coordinating and integrating the partnership's research activities into the overall research agendas of the represented industries. By integrating five ETPs in the partnership, additional research needs in the respective thematic areas are taken into account and synergies with ongoing research efforts are being created. This ensures an overall view of research needs for transport and mobility, taking a high-level perspective or umbrella-view, so no important research areas are left out. ETP as an instrument can contribute to this perspective, making the 2Zero partnership more effective in achieving synergies.

Survey results (see Annex 8.3.3) show that of the 2Zero respondents (50%) collaborated with projects funded under other Horizon Europe programmes/clusters, mainly with Cluster 5 (50%). Some collaboration has taken place with 'Pillar I - Marie Sklodowska-Curie (12.5%) as well as 'Widening participation and spreading excellence' and Cluster 4 (8.3% each). The other half did not have any joint activities with other Horizon Europe projects. These results are comparable to the overall results of Cluster 5.

Coherence with other parts of the framework programme is being assured by the Partnership Board, which includes different DGs. The Member States are involved via the States Representatives Group (SRG).

Interviewees pointed out that there is room for improvement in strengthening links with other funding instruments and sources. Closer links would be beneficial with national and maybe even regional funding. Some additional guidance and resources from the horizontal units would be welcome to support investigation and discussion with additional stakeholders at the national and regional levels. The State Representatives Groups (SRG) of the partnerships can support this process. Also, closer links with other European funding programmes would be seen as positive. Connecting Europe Facility (CEF), Digital Europe Programme (DEP), LIFE - Programme for Environment and Climate Action and InvestEU Programme are programmes that have been promoted to stakeholders[7].

[7] Indicator no. 7, BMR-Survey Data 2023 received from EC.

4.3. Efficiency

Administration and management: 2Zero is a well-managed partnership with lean structures benefitting from the experience gained from its predecessor. The partnership set-up builds on EGVI and integrates new stakeholders. The representation of different ETPs, main industries and research institutes in the governing bodies, especially the Board, can be highlighted. According to interviewees there is also a good engagement of participants in the General Assembly. The SRG proves to be beneficial by sharing learnings around national plans for charging infrastructure deployment and grid integration.

Project application and selection processes: These are fully managed by the European Commission. Delegating these processes to the European Climate, Infrastructure and Environment Executive Agency (CINEA) added an additional layer of coordination. As a result, feedback from projects to policy can take more time and can be more complicated. Some additional feedback pathways to policy are now being established but it is not simple because of time and resource constraints. Survey results (see Annex 8.3.3) show an overall satisfaction with the efforts needed to prepare and submit a HE proposal. The biggest share of respondents who do not agree at all or agree to a small extent (28%) is with the statement that the 'efforts needed were in proportion to the chances of securing HE funding'. This compares to 22% in Cluster 5.

Funding allocation: The budget of the partnership was reduced in comparison to initial planning figures, but at the same time, the scope was widened. According to interviewees, the level of objectives and the level of financial commitment seem not to match completely. It is still considered a good budget to build up an ecosystem bringing together more than 100 members willing to contribute to a roadmap, to come together and share ideas.

Processes: Survey results show overall satisfaction with the administration and management processes in Horizon Europe, with 2Zero respondents being more dissatisfied with the proportionality of the burden of administrative requirements for the granting procedure (31%) than Cluster 5 respondents (17%) (see Annex 8.3.3). According to interviewees, the efficiency in the preparation of the work programme should be improved. In particular, it would be very beneficial to improve the communication as well as the timing of the involvement of all relevant actors, including the different EC services. Also, the private side would like to see more frequent and more focused calls. This could prove to be challenging because even more frequent consultations involving partnership members and the Commission would be needed. In general, more coordination and collaboration are needed because of new types of initiatives, such as additional partnerships and Missions. The landscape of funding instruments and actors is more complex and fragmented than in H2020, adding another layer of consultation and coordination, for example, for joint calls.

Regarding the efficiency of the partnership reporting processes[8] , the partnership management mentions that working in parallel on the BMR (Biennial Monitoring Report) and the Full Monitoring report is time-consuming and not efficient. Deadlines and templates are similar but deviate in details. It is being suggested to compile BMR data by extracting data from the Full reports. Additionally, partnership type specific templates are suggested. Specifically, the template Membership in partnerships does not correspond exactly to the categorisation in the Horizon dashboard, nor does it reflect the partnership's categorisation of members. Another critical aspect highlighted was that all partnerships should report the same level of detail of information, which is not always relevant to the different types of partnerships.
Types of actions: Interviewees see a push from the Commission towards IAs that are addressing higher TRL (starting at TRL 5 or 6). This is perceived as difficult, especially for members of the automotive industry, which is highly competitive. To enable cooperation, the

[8] Efficiency, BMR-Survey Data 2023 received from EC.

partnership clearly needs to stay in the area of pre-competitive research. Interviewees also point out that it is important not to forget about the low TRLs, which are generally focused on research innovation action (up to TRL 4 to 6 at the end of the project). This already finds its expression in a higher share of RIA compared to the rest of Cluster 5.

Given the timing of this evaluation, it is not appropriate to give an overall assessment of its effectiveness (see next section), nor is it possible to give an overall assessment of the cost-effectiveness of the partnership.

4.4. Effectiveness

The 2Zero partnership builds on the results of its predecessor, EGVI, that contributed to the advancement of electromobility in Europe. The bibliometric analysis for EGVI's research outputs and outcomes against 'Societal Challenge 4 - Smart, Green and Integrated Transport' of H2020, for example, shows above-average performance on five indicators, equivalent performances for seven indicators and below-average performance against only one indicator (see Annex 8.3.1).

The earliest end date of the funded projects is in May 2025. Therefore, outputs and outcomes for 2Zero are not yet visible, i.e. it is too early to assess 2Zero's effectiveness. Findings on the prior performances of those researchers selected for funding in 2Zero (see Annex 8.3.2) show that their past research was thematically highly aligned with the SDGs (77% for 2Zero against 48% at EU27+UK overall level), had a high share of academic-private co-publications at 21% (compared to 7% at EU27+UK overall level) and a higher than average citation impact. On the other hand, prior research by partnership researchers had lower levels of international co-publication, included fewer women co-authors (only 22% of 2Zero prior research authors were women, against 40% at EU27+UK overall level) and also showed below-average open access publishing. However, past performance is subject to change, and the ambitions of the partnership to improve some of the practices of supported researchers will most likely prevent replication of what has come before. These findings, therefore, can help focus on areas that might require particular improvement and/or monitoring.

In terms of outputs expected to be produced as a result of their project, the survey results show the strong technology and innovation orientation of 2Zero (see Annex 8.3.3). The biggest share of the 2Zero respondents indicated 'testing, demonstration and piloting' (75%) as expected outputs, followed in equal parts by 'prototype' and 'research publications' (69.4%). In contrast, in Cluster 5, 'research publications' has the biggest share (78.7%), with 'testing, demonstration and piloting' reaching a share of 68.3% and 'prototype' a share of only 43.3%. Also, some 86% of respondents consider to a large and very large extent that their project is going to achieve the development of sustainable solutions contributing to a green transition (compared to 70% in Cluster 5).

To assess the overall effectiveness of 2Zero in a timely manner, the partnership has agreed on impact pathways and key performance indicators (see Annex 8.1.3 and 8.1.4). These are being monitored and will show progress against targets in due course.

The 2Zero partnership SRIA strongly emphasises a user-centric approach (users referring to both people and companies using commercial vehicles). The user-centric approach, as outlined in the SRIA, does not explicitly address a gender dimension, though.

The Executive Board of 2Zero is composed of 7 men and 1 woman[9]. The share of female participation in 2Zero projects is 17%, thus being lower than in most other partnerships covered in this study, with shares ranging between 13% and 39% (see Appendix 8.2.2.) This is also well below the proportion of women employed in science and technology in the EU in 2022 (52%) and the overall proportion of women among scientists and engineers (41%)[10].

4.5. EU added value

Networking at the European level helps to leverage knowledge and capacities between European countries. The core automotive countries are well represented but the network analysis also shows that 2Zero manages to assure collaboration across the whole of Europe. One mechanism to achieve this is dedicated events in less-represented countries. These meetings are organised in different Member States and Associated Countries to increase awareness and attract interest of stakeholders. The SRG facilitates learning by circulation of relevant information including relevant countries' strategies and initiatives. There is a strong request for this exchange by members of the SRG.

Survey results show (see Annex 8.3.3) that three-quarters of 2Zero respondents (75%) agree to a large and very large extent that compared to the research funding available on national and regional levels, Horizon Europe funding involves a higher level of competition. At the same time, 64% of respondents state that Horizon Europe funding provides a higher amount of funding than national/regional schemes, indicating that it is an attractive source of funding. Moreover, 71% of respondents believe Horizon Europe funding provides more opportunities for international mobility. A consistently high share of respondents agree that Horizon Europe funding brings additional benefits. Only 11% of respondents believe there are no additional benefits to be gained from Horizon Europe funding compared to national/regional funding.

Interviewees point out that in comparison to national funding, European programmes are more complex because they require participants from several countries, but their clear benefit is the European collaboration. This is especially true for road transport as it is key to achieving the EU Single Market and goes beyond national borders. The partnership is an instrument for discussion and fosters collaboration between actors across the EU on a specific path with a clear target. Compared to collaborative research, there is added value from more planning in direct contact with industry. Especially for charging, infrastructure aspects of data sharing and standards still have to be addressed, which includes legislative issues. This needs a European approach to ensure interoperability.

4.6. Additionality

The European Commission envisages dedicating up to EUR 615 million to actions within 2Zero, while the partners other than the European Union will dedicate the same amount in the form of in-kind contributions to the Actions funded by the Union – by August 2023; this amount was EUR 527.4 million[11] – and to Additional Activities. In addition, the partners other than the Union intend to make investments in operational activities that go beyond the work foreseen in the SRIA.[12]
The direct leverage in this report represents the additional funds from third parties, public or private that the EU project budget funds have mobilised (see Annex 8.3.4). In 2Zero, the total eligible costs amounted to EUR 231.3 million (June 2023). The EU funding rate for all action

[9] The composition oft he governing bodies other than the executive board is stated by organisation not by individuals representing these organisations. https://www.2zeroemission.eu/who-we-are/governing-bodies/ [26.02.2024]

[10] Source: Eurostat. https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230602-1

[11] Indicator no. 1, BMR-Survey Data 2023 received from EC: "How much have the partners other than the Union committed in kind to this partnership by August 2023? [million €]"

[12] https://www.2zeroemission.eu/wp-content/uploads/2021/11/2Zero-Memorandum-of-Understanding-signed-1.pdf [19.05.2023]

types was 81.7%. The direct leverage factor for all action types was 0.224 for all actions. The innovation actions exhibited the highest leverage (0.426), whereas RIA (0.033) and CSA (0.027) have a significantly lower direct leverage. The leverage from the Business Enterprise Sector was 0.38 for all types of actions and, thereby considerably higher than for other organisations. Innovation actions yielded a leverage factor of 0.689.

Interviewees emphasise that a major benefit of the partnership is bringing a community together and creating a forum to enable collaboration between research, SMEs, and larger industrial players: in other words, creating and expanding an ecosystem. Especially the industrial players value this aspect of the 2Zero partnership. Being a member of this ecosystem enables them to provide input to the work programme and co-create roadmaps. In addition, they are able to connect with others to get early feedback on the directions of market development. This gives them an advantage that eventually reduces time-to-market and makes them more competitive in the long run. With the more systemic approach of 2Zero, they also learn about barriers that still need to be tackled in order to best enter the market.

4.7. Directionality

2Zero has a well-established goal system elaborated in the SRIA[13] that positions its objectives within the programme objectives stated in the proposed framework programme of Horizon Europe and outlines general objectives, specific objectives and operational objectives of the partnership. This is completely in line with the policy on research and innovation, and it covers what is needed to contribute to the Green Transition to achieve climate neutrality in 2050 under the mobility aspect. 100% of the budget is directed to the Green Deal objectives (progress of investment by August 2023: 63%)[14].

The issues of European strategic autonomy and technological sovereignty are highly relevant to the 2ZERO partnership[15]: Critical raw materials and rare resources, such as lithium, cobalt, and rare earth elements, are essential for the production of batteries and electric vehicles. Developing strategies for responsible sourcing, recycling, and domestic production of these resources is crucial to meeting the partnership's sustainability goals while avoiding dependencies and enhancing the EU's strategic autonomy.

To measure progress towards expected outcomes, a monitoring framework has been introduced that gives KPIs for each of the levels and objectives. The process of defining the framework was difficult as not all KPIs and targets were under the control of the partnership members. The Commission is also focusing on long-term objectives that need to be contributed to by the partnership.

4.8. International positioning and visibility

The members of the partnership are a unique group of stakeholders; sector leaders are included as well as the relevant ETPs. Interviews suggest that this already assures a high international visibility of the partnership. Stakeholders in the UK expressed a strong interest in the 2Zero partnership activities, and EGVIAfor2Zero was invited several times to present the partnership to national and local stakeholders from Poland and Hungary[16].

The CSA project Strength_M has dedicated activities to identify the feasibility and possible barriers to the deployment of research results on an international level and to create new links with international cooperation task forces. It will also develop dissemination strategies

---

13 https://www.2zeroemission.eu/wp-content/uploads/2023/01/2Zero-SRIA-webversion-2022.pdf, p. 24 [19.05.2023]
14 Indicator no. 3, BMR-Survey Data 2023 received from EC.
15 Thematic focus of the BMR 2024, BMR-Survey Data 2023 received from EC.
16 Indicator no. 9, BMR-Survey Data 2023 received from EC.

and support the organisation of European and international road transport research-related events.[17]

International cooperation takes place on a very low level (5 participations, 1.2% of all participations, see Annex 8.2.2) and could be further developed. It was encouraged in one of the 2Zero topics in WP2023[18]. It is worth noting, though, that not all topics require international cooperation. Also, a balance between the open market, protection of Intellectual Property (IP) and strategic assets needs to be found, particularly in the electric vehicle market and the European value chain for the creation of batteries.

4.9. Transparency & Openness

There are more than 100 members in the partnership. The EGVIAfor2Zero is welcoming requests for membership from European-based stakeholders active in the areas covered by the partnership. Already, a wide group of stakeholders is involved in the partnership, especially through the ETPs. Nevertheless, because of the new system focus, there are activities underway to attract new participants, especially around charging infrastructure and energy actors.

The calls are open, and the selection process is completely independent of the 2Zero partnership. With 419 participations so far, the figures demonstrate that the partnership is open to a wide range of actors, not only members. The share of SME participation in 2Zero is 24% and, as such, lower than most co-programmed partnerships covered in this study, which have an average share of SME participation of 40%. This may be due to the specificities of the automotive industry, being mostly concentrated around big international players, both at the Original Equipment Manufacturer (OEM), Tier 1 and Tier 2 supplier level. In this global market, innovation by SMEs mostly regards process innovation (also under other partnerships) flowing to the final product mainly through the big players.

4.10. Phasing out preparedness

For co-programmed partnerships, there is no obligation to prepare this so early in their existence.

5. Conclusions

2Zero partnership is aiming at accelerating the transition towards zero tailpipe emission road mobility across Europe. The partnership takes a system approach, looking not only at the vehicle but also at the charging infrastructure, connection to the smart grid, circularity and life cycle assessments, making it highly relevant for the Green Transition. Expected outputs show the strong technology and innovation orientation of 2Zero, indicating marketable results.

The activities of 2Zero involve stakeholders from the automotive, smart systems, and smart grid industries, logistics companies and freight transport users, research centres and universities. By integrating the European Technology Platforms ERTRAC, EPoSS, SNET, ALICE and Batteries, Europe, 2Zero brings together all relevant organisations dealing with research and development activities in the fields covered by the partnership.

EU-added value is created by collaboration across the whole of Europe, which is particularly necessary for road transport as it is key to achieving the EU Single Market. Compared to

[17] https://www.2zeroemission.eu/research-project/strength_m/ [31.05.2023]
[18] Indicator no. 9, BMR-Survey Data 2023 received from EC.

collaborative research, there is added value from more planning in direct contact with industry.

6. Lessons Learned & Recommendations

There needs to be a balance between a targeted, focused approach that a partnership can support and an overall perspective on future research needs. The ETP seem to be a good way of ensuring synergies and coherence with research and innovation activities in the represented industries.

Links with other funding instruments on European as well as national/regional levels should be strengthened. Guidance from horizontal units, as well as support from the State Representatives Groups (SRG) of the partnerships, should be sought to facilitate this.

Consultation processes only work effectively if all parties engage in them fully. There is work necessary and underway to improve communication and coordination within the Commission to engage and align all relevant DGs at the appropriate times.

New initiatives like additional partnerships and Missions also add an additional layer of coordination between the partnership and the initiative, e.g. alignment of research agendas and work programmes or joint calls. Future evaluations should assess whether the results balance out the efforts.

The involvement of female researchers and partners is below average, and data for women's representation in the partnership's governance is not fully available. Their representation should be monitored, and actions should be taken for better inclusion.

SME participation is below the levels of other co-programmed partnerships mainly due to the automotive industrial structure. As they are highly relevant to the European economy and can be a source of innovative ideas and flexible approaches, a higher share of SMEs participating in 2Zero projects should be aimed at.

7. Sources

2Zero (2020): SRIA – Strategic Research and Innovation Agenda 2021-2027. https://www.2zeroemission.eu/wp-content/uploads/2023/01/2Zero-SRIA-webversion-2022.pdf [19.05.2023]

2Zero (2021): Memorandum of Understanding. https://www.2zeroemission.eu/wp-content/uploads/2021/11/2Zero-Memorandum-of-Understanding-signed-1.pdf [19.05.2023]

BMR (2022): European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363

BMR (2023): European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2023 on partnerships in Horizon Europe, Data 2023 received from EC.

8. Annex

8.1. Supplementary evidence: Background to the initiative

8.1.1. Partners in 2Zero

The European Green Vehicles Initiative Association for the 2Zero partnership (EGVIAfor2Zero) represents the partners in 2Zero other than the European Union. It is organised as an international non-profit association. It differentiates between full members and associate members. The category of full membership is divided among:

- Industry members: private companies based in the EU active in the fields of the partnership, especially automotive industry, smart systems/smart grids industry, logistics companies and freight transport users.

- Research members: research organisations and universities active in the field of road transport technologies and road transport research.

Associate members represent non-governmental organisations involved in European transport research.

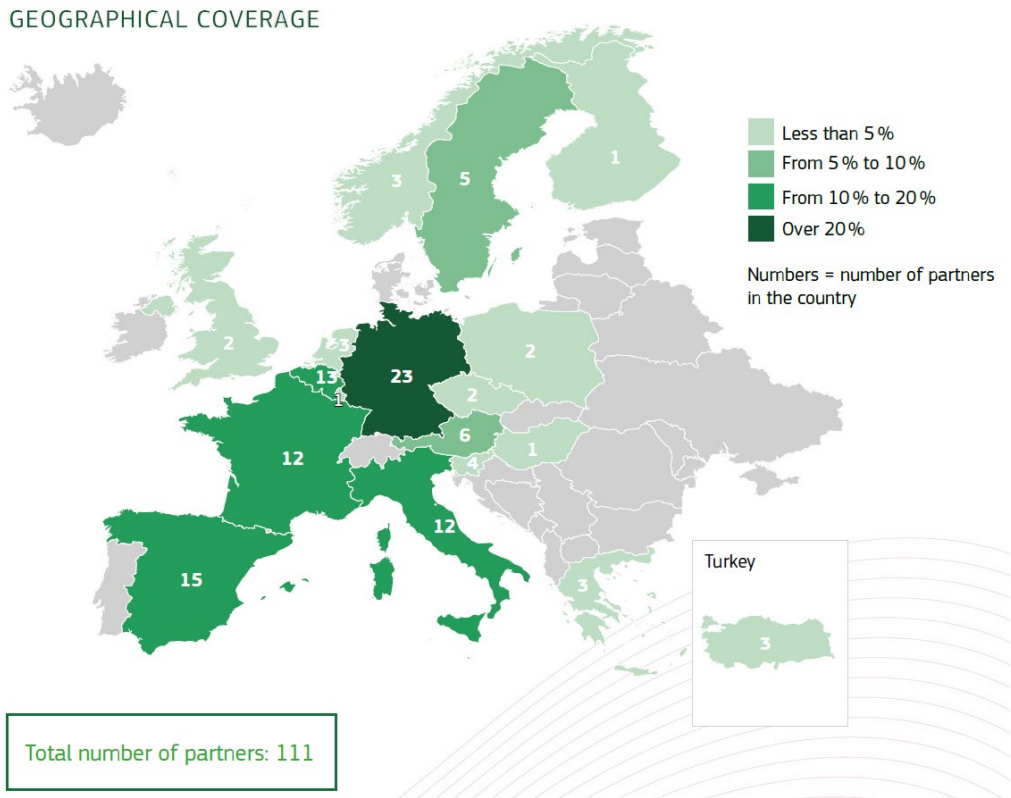

Figure 1: Number and geographical coverage of partners in 2Zero across Europe in 2022

Source: European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363, p 301

As of mid-May 2023, the European Green Vehicles Initiative Association for the 2Zero partnership (EGVIAfor2Zero) has 115 members.

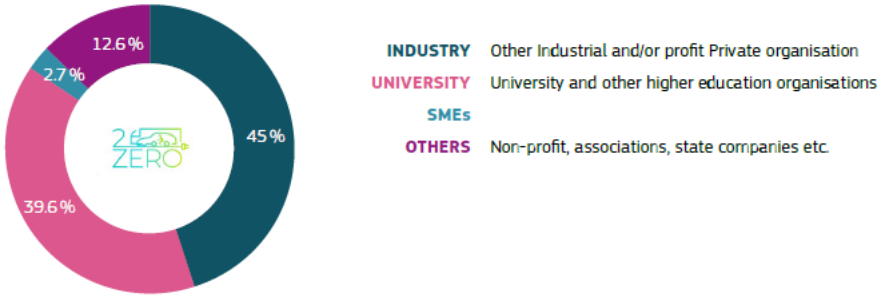

Figure 2: 2Zero members per type

Source: European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363, p 301

8.1.2. Governance of 2Zero

The 2ZERO governance structure consists of:

- The **General Assembly** is the supreme body of the members association EGVIAfor2Zero. It approves the general policy based on proposals from the Executive Board and gives recommendations for its implementation. It meets at least once a year.

- The **Executive Board** defines the strategy of the Association and manages its work including financial management and external representation. It is legally responsible for the Association and is accountable to the General Assembly. The Executive Board is chaired by Stephan Neugebauer. Five Vice-Chairmen represent the automotive industry, the smart systems industry, the research members, and the logistics companies and freight transport users. The Director and the Secretary General are members of the Executive Board as well.

- The **Delegation to the Partnership Board** is composed of up to 26 members elected by the General Assembly to represent the association in the Partnership Board. They are elected for a 2-year mandate, which can be renewed. The member groups represented in the Executive Board as well as the European Technology Platform secretariats are represented in the Delegation to the Partnership Board.

- The **Partnership Board** is the governing body of the 2Zero partnership. It is the primary mechanism for dialogue between the two sides of the partnership, the European Commission and the Association. While EGVIAfor2Zero is represented through the Delegation to the Partnership Board, the European Commission is involved via the different DGs active in the partnership (DG RTD, DG MOVE, DG ENER, DG CLIMA).

- The **States Representatives Group** involves representatives of the EU Member States and countries associated to Horizon Europe. This informal body facilitates the exchange of information between the partnership level and activities performed at the national and/or regional level and thus reinforces the alignment of activities.

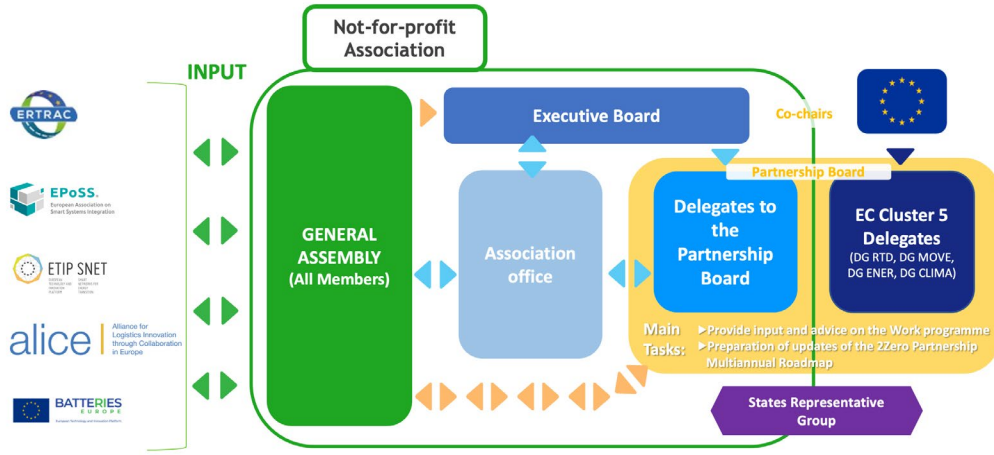

Figure 3: 2ZERO governance structure

8.1.3. Impact pathways

The activities of the partnership are expected to contribute to the transition to Europe's carbon-neutral road transport system by 2050, to technology leadership supporting economic growth and job creation, European competitiveness as well as to improving the quality of life of EU citizens. They are also contributing to the Sustainable Development Goals #7 Affordable and Clean Energy, #8 Decent Work and Economic Growth, #11 Sustainable Cities and Communities and #13 Climate Action[19]. The partnership specific impact pathways towards these priorities and goals are depicted in Figure 4.

[19] European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363, p 296

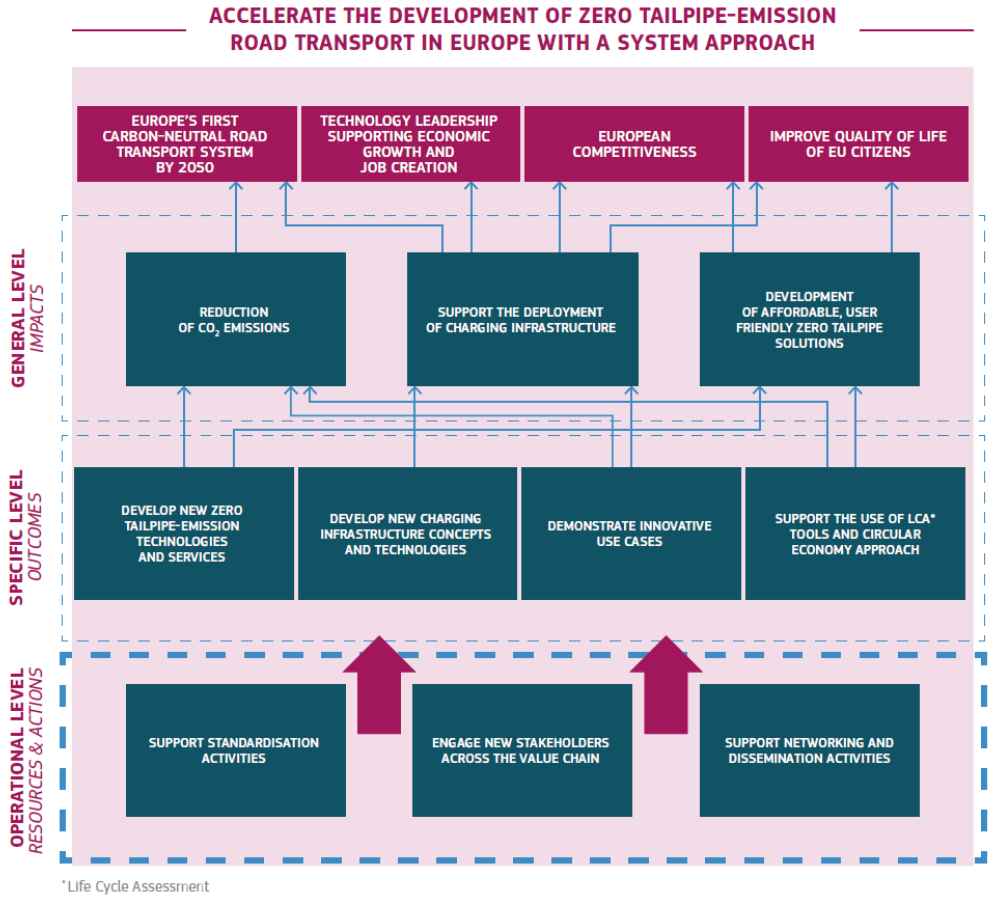

Figure 4: 2Zero partnership specific impact pathways

Source: European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363, p 297

8.1.4. Key Performance Indicators

KPI NAME	UNIT OF MEASUREMENT	BASELINE	TARGET 2023	TARGET 2025	TARGET 2027	AMBITION >2027
RESOURCES (INPUT), PROCESSES AND ACTIVITIES						
Share of funding going to SMEs	%	TBD				TBD
IPR generated in funded projects	#	TBD				TBD
Events organised by the Association	#	TBD				TBD
OUTCOMES						
GHG of mobility of people and goods	tonCO_2eq /pkm or tkm and toe/pkm and toe/tkm	2020				Reduction of GHG and energy intensity of mobility by 30% for personal mobility and 25% for freight by 2030
Reduction of development time and effort		2020				Estimated 20% decrease of development time and effort including via digitalisation
Improvement of charging efficiency demonstrated	%	2020				At least 25% reduction of energy losses during charging (considering both charger and vehicle) by 2030 for all types of chargers
Number of (public and private) transport operators implementing zero-tailpipe business models and use cases for freight transport and people mobility	#	2020				30 passenger transport and freight transport and logistics use cases demonstrated in projects over the lifetime of the partnership
Reduction of CO_2 emissions from road transport for all types of vehicles	% CO_2 emission at fleet level	1990				Contribution to the overall target of 55% reduction of CO_2 emission in 2030 (public target)
Number of (publicly available) electric recharging and hydrogen refuelling stations available in the EU in 2030	#	2020				Contribution to achieve 3 m public charging points in 2030 (public target)

Figure 5: Abstract of 2Zero's key performance indicators

Source: European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363, p 297

8.2. Supplementary evidence: Implementation state of play

8.2.1. 2Zero Calls

There have been 11 2Zero-specific calls until June 2023 and 3 joint calls with other partnerships (see Table 1).

Table 1: 2Zero Calls

Deadline Date	Title	Call ID	Type of
14.09.2021	Nextgen vehicles: Innovative zero emission BEV architectures for regional medium freight haulage	HORIZON-CL5-2021-D5-01-01	IA
14.09.2021	Nextgen EV components: Integration of advanced power electronics and associated controls	HORIZON-CL5-2021-D5-01-02	RIA
14.09.2021	System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions	HORIZON-CL5-2021-D5-01-03	RIA
14.09.2021	LCA and design for sustainable circularity - holistic approach for zero-emission mobility solutions and related battery value chain (with Batteries Partnership)	HORIZON-CL5-2021-D5-01-04	CSA
26.04.2022	Modular multi-powertrain zero-emission systems for HDV (BEV and FCEV) for efficient and economic operation	HORIZON-CL5-2022-D5-01-08	IA
26.04.2022	New generation of full electric urban and peri-urban Bus Rapid Transit systems to strengthen climate-friendly mass transport	HORIZON-CL5-2022-D5-01-10	IA
20.04.2023	Nextgen EV components: High efficiency and low cost electric motors for circularity and low use of rare resources	HORIZON-CL5-2022-D5-01-09	RIA
20.04.2023	User-centric design and operation of EV for optimised energy efficiency	HORIZON-CL5-2023-D5-01-01	IA
20.04.2023	Innovative battery management systems for next generation vehicles (with Batt4EU)	HORIZON-CL5-2023-D5-01-02	IA
20.04.2023	Frugal zero-emission vehicles concepts for the urban passenger challenge	HORIZON-CL5-2023-D5-01-03	IA
20.04.2023	Circular economy approaches for zero emission vehicles	HORIZON-CL5-2023-D5-01-04	RIA
20.04.2023	Measuring road transport results towards 2ZERO KPIs	HORIZON-CL5-2023-D5-01-05	CSA

Deadline Date	Title	Call ID	Type of
27.04.2023	Co-designed smart systems and services for user-centred shared zero-emission mobility of people and freight in urban areas (with CCAM and Cities' Mission)	HORIZON-MISS-2023-CIT-01-01	IA

Source: Funding & Tender opportunities SEDIA [16.06.2023]

8.2.2. Project portfolio characteristics

The project portfolio of 2Zero underlying this analysis comprises 20 projects. The sum of EC's net contribution is EUR 188.9 million. This represents a share of about 30% of the dedicated budget.

A share of 59% of EC's net contribution has been allocated to private companies, 17% to higher education institutions and 15% to research organisations (see Table 2). Compared with Cluster 5, the project portfolio of 2Zero has a higher share of participation of private companies (60% in the partnership vs 51% in Cluster 5), indicating a particularly high involvement of the industry. The largest gap exists for the participation of research organisations, which only have a share of 15% in 2Zero vs a 26% share in Cluster 5. With a 1% share of the participation, there are only a few public bodies involved in the partnership projects in comparison to a share of 5% in the Cluster.

Table 2: Type of organisations in 2Zero

Type of organisation	Number of projects	Participations		EC contribution		EC Contr. per part. (EUR 1000)
		Nb	Share (%)	EUR (1000)	Share (%)	
HES	20	70	17%	30,742	16%	439.2
OTH	11	32	8%	8,606	5%	268.9
PRC	20	250	60%	110,851	59%	443.4
PUB	3	6	1%	911	0%	151.8
REC	17	61	15%	37,797	20%	619.6
Total (All types)	**20**	**419**	**100%**	**188,907**	**100%**	**450.9**

HES: Higher or Secondary Education Establishments
PUB: Public bodies (excluding Research Organisations and Secondary or Higher Education Establishments)
REC: Research Organisations
PRC: Private for-profit entities (excluding Higher or Secondary Education Establishments)
OTH: Other
Source: eCorda, own calculation.

The allocation of funding is almost evenly spread between Research and Innovation Actions (49.4%) and Innovation Actions (48.7%) (see Table 3). This indicates that the portfolio includes projects on higher TRL while not neglecting lower TRL research, as RIAs usually focus on lower TRL and IAs on higher TRL. In comparison, the share of funding going to RIA in Cluster 5 is only 33.2% and to IA 62.4%.

Table 3: Type of actions/instruments (grouped) in 2Zero

Group of Action/instrument	Number of projects	Participations		EC contribution		EC Contr. per part.
		Nb	Share (%)	EUR (1,000)	Share (%)	(EUR 1,000)
IA	5	156	37.2%	91,965.7	48.7%	589.5
RIA	14	217	51.8%	93,266.0	49.4%	429.8
CSA	1	46	11.0%	3,675.2	1.9%	79.9
SME	0	0	0.0%	0.0	0.0%	N/A
Other	0	0	0.0%	0.0	0.0%	N/A
All types	**20**	**419**	**100.0%**	**188,906.8**	**100.0%**	**450.9**

Source: eCorda, own calculation.

Looking at the share of participation across the different types of actions (see Figure 6), it becomes clear that private companies engage most often in innovation actions (65%), while higher education establishments have the highest share in research and innovation actions (23%). Other types of organisations (17%) participate most often in the coordination and support action project, which also has a more even spread across the different types of participants. This distribution is in line with the different types of instruments.

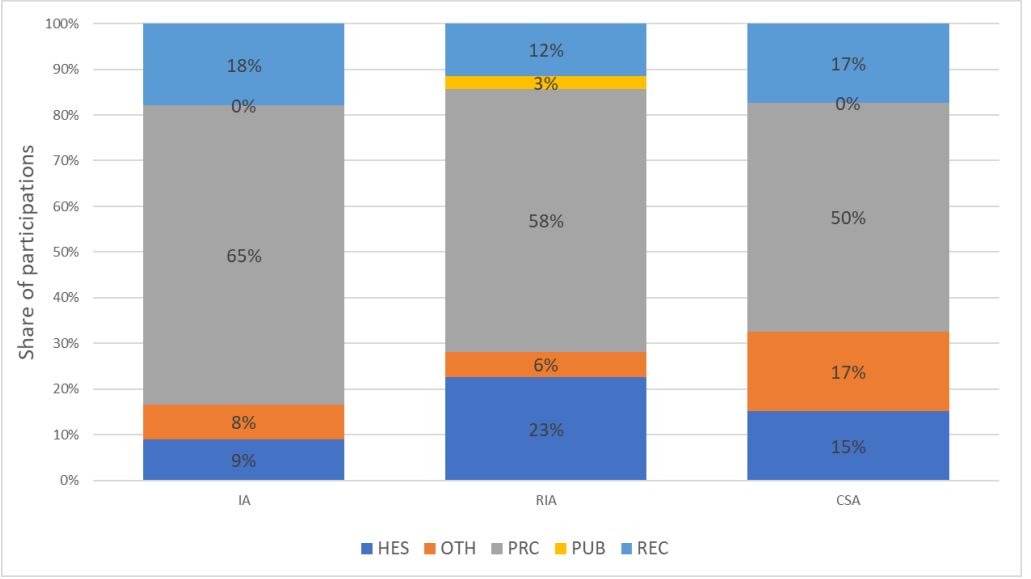

Figure 6: Share (%) of participations by type of action/instruments.

Source: eCorda, own calculation.

Geographically, the eCorda statistics show that 2Zero is mainly concentrated on EU-14 countries, as they represent the main automotive clusters in the EU (see Table 4). 81.1% of the participations and 89.1% of EC contribution are shared among this group. EU-13 countries have a share of almost 8.8% of the participation and 6.1% of the contribution. The remainder of the EC contribution (4.8%) goes to associated countries. The UK and third countries participate (4.8% and 1.2%) but are not receiving EC funds.

Table 4: Group of countries of 2Zero

Group of country	Number of projects	Participations		EC contribution		EC Contr. per part. (EUR 1,000)	Number of countries
		Nb	Share (%)	EUR (1,000)	Share (%)		
EU-27	20	377	90.0%	179,893	95.2%	477.2	21
EU-14	*20*	*340*	*81.2%*	*168,294*	*89.1%*	*495.0*	*14*
EU-13	*16*	*37*	*8.8%*	*11,599*	*6.1%*	*313.5*	*7*
Associated (excl. UK)	9	17	4.0%	9,013	4.8%	530.2	3
United Kingdom	11	20	4.8%	0	0.0%	0.0	1
Third Countries	4	5	1.2%	0	0.0%	0.0	1
All-countries	**20**	**419**	**100.0%**	**188,907**	**100.0%**	**450.9**	**26**

Source: eCorda, own calculation.

In terms of participation, Germany has the highest share of participation (14.6%) and EC contribution in total funding (14%), highlighting the strong automotive industry of this country. Belgium, Italy and Spain follow with shares of participation at 10%, 9.8% and 9.5% and shares of funding at 11%, 14% and 10% respectively. Austria, the UK and France also show strong participation in terms of the numbers of projects.

Table 5: Top countries (of supported organisations) in 2Zero

Top 15 country	Number of projects	Participations		EC contribution		EC Contr. per part. (EUR 1,000)	Order
		Nb	Share (%)	EUR (1,000)	Share (%)		
Germany	17	61	14.6%	26,288	14%	430.9	1
Belgium	14	42	10.0%	21,216	11%	505.1	2
Italy	13	41	9.8%	26,619	14%	649.2	3
Spain	13	40	9.5%	19,036	10%	475.9	4
Austria	11	25	6.0%	12,899	7%	516.0	5
United Kingdom	11	20	4.8%	0	0%	0.0	6
France	10	34	8.1%	12,275	6%	361.0	7
Netherlands	9	33	7.9%	15,101	8%	457.6	8
Turkiye	7	14	3.3%	8,393	4%	599.5	9
Sweden	6	16	3.8%	11,494	6%	718.4	10
Czechia	5	11	2.6%	2,728	1%	248.0	11
Greece	5	10	2.4%	4,731	3%	473.1	12
Slovenia	5	13	3.1%	4,771	3%	367.0	13
Finland	5	12	2.9%	7,492	4%	624.3	14
Portugal	4	11	2.6%	4,879	3%	443.5	15
Poland	4	6	1.4%	1,998	1%	333.0	16
Switzerland	4	5	1.2%	0	0%	0.0	17
Denmark	4	9	2.1%	4,953	3%	550.3	18
Total	**147**	**403**	**96%**	**184,872**	**98%**	**7,753.0**	

Source: eCorda, own calculation.

The network analysis based on the number of collaborations among organisations from each pair of countries in the projects included in this partnership portfolio shows strong links between those countries representing the main automotive clusters in the EU. However, overall, it shows a slightly more even distribution with strong collaboration across the majority of countries in the EU.

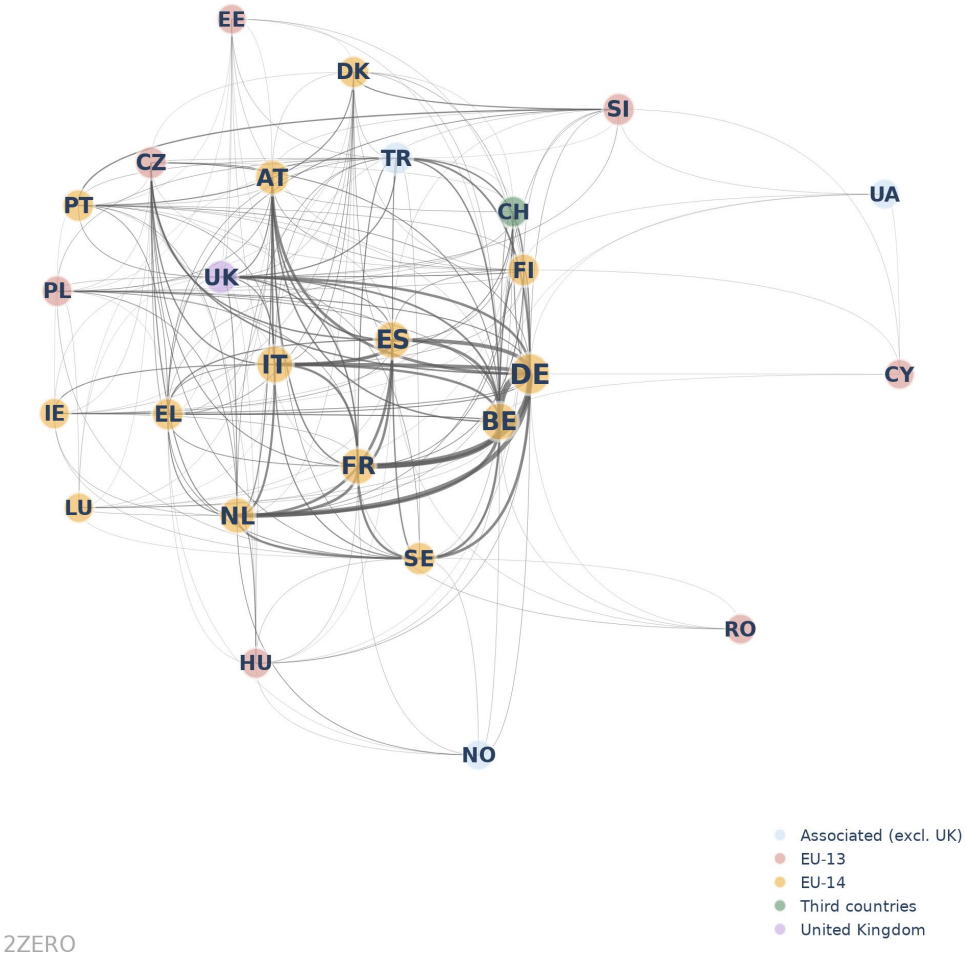

Figure 7: Network of participating countries in 2Zero

Source: eCorda, own calculation.

The table below includes two distinct metrics of female participation:

- Average share of female participants: first computed the share of female participants in each project, then averaged across projects; and
- Share female participation: the number of female participations (i.e., researchers are counted more than once if they participate in different projects) divided by total participation.

Table 6: Female participation in partnerships

Partnership	Nb projects	Nb participations (organizations)	Nb participations (researchers)	Average share female participants	Share female participations	Nb female participations	Nb male participations	Nb non-binary participations
ER (Shift2Rail successor)	6	452	152	15%	15%	23	129	0
Batt4EU	50	702	626	25%	25%	155	470	1
Clean Steel	10	102	96	24%	24%	23	73	0
2ZERO	20	420	363	18%	17%	63	300	0
CLEANH2	45	498	417	23%	22%	93	324	0
Built4People	6	132	113	30%	29%	33	79	1
CLEAN-AVIATION	20	492	440	18%	16%	70	370	0
CCAM	18	348	310	24%	22%	69	241	0
CBE	21	293	274	39%	39%	108	166	0
SESAR 3	15	108	103	25%	24%	25	78	0
ZEWT	26	334	306	14%	13%	40	266	0

Data on gender as available in CORDA is subject to a few limitations:

- Since data at grant table was only available for “main contacts” (i.e., 1 person per project), with no gender information, we took the researchers from the proposal table. However, the composition of teams may have changed from proposal to project.

- It is difficult to distinguish researchers among the persons included in this table. Visual inspection indicates that most of them were researchers (i.e., not administrative roles only).

- By comparing the number of participations (based on organisations) with the number of participations (based on researchers), it is clear that only a small part of researchers involved in the projects are included in CORDA.

The above table is based on the most recent CORDA provided to us.

8.3. Supplementary evidence: Results

8.3.1. Bibliometric findings for the Green Vehicles cPPP partnership

Key strengths of Green Vehicles research outputs and outcomes

- The share of Green Vehicles publications that are academic-private co-publications is 24%, modestly above the SC4 level of 17%. The EU27 average in the area is 13%.

- The share of Green Vehicles publications with participation from at least one woman author is 41%, slightly above the share of 37% recorded for other SC4. The EU27 average is 41%.

- Green Vehicles publications included a share of exceptionally highly cited publications that was more than 4 times the expected level (4.4), compared to 2 times the expected level in the SC4 baseline (1.9; data not shown). These exceptionally highly cited publications fall amongst the top 1% of publications most highly cited within their subfield for a given year. Nevertheless, given the small number of such publications in any given thematic area, this indicator is subject to some amount of volatility, and therefore, this result must be interpreted with caution.

- The share of Green Vehicles publications mentioned by policy-related documents is 12 times the expected level, compared to 4 times the expected level in the SC4 baseline. Caution must be exerted in interpreting this finding, however. Mentions of journal publications in policy-related documentation are optimally computed using citation windows of 4 years, which has not elapsed here. Therefore, these findings are preliminary and subject to change in future evaluations.

Findings of equivalent performances for Green Vehicles research outputs and outcomes against SC4

Green vehicles publications recorded comparable achievements to those of other SC4 projects on the following dimensions:

- Green Vehicles publications recorded shares of international co-publication and geographical distribution of authorship similar to those of the SC4 baseline. For instance, 36% of Green Vehicles publications are international co-publications, against 39% in the baseline.

- On most dimensions of cross-disciplinarity (except the share of highly interdisciplinary papers as previously mentioned), Green Vehicles publications steered closely to the levels also achieved in the SC4 baseline.

- The shares of Green Vehicles publications' authorships that were held by women is comparable to SC4 (for instance, 16% of paper-level authorships on average, against 15% in the baseline).

- Citation impact performances of Green Vehicles publications are comparable to other SC4 publications, with the exception mentioned above of exceptionally highly cited publications (for example, a CDI of 21 for both Green Vehicles publications and other SC4 publications).

- The share of Green Vehicles publications available under an OA modality is comparable (64% against 62% in the baseline).

- The share of Green Vehicles publications mentioned by patents-related documents is 2 times the expected level, as in the SC4 baseline. Caution must be exerted in interpreting this finding, however. Mentions of journal publications in patents are optimally computed using citation windows of 7 years, which has not elapsed here. Therefore, these findings are preliminary and subject to change.

- The share of Green Vehicles publications with one or more mentions on Facebook, Twitter or Wikipedia is also comparable (for instance, 2.2 is the expected level of mentions of Twitter, against 2.5 in other SC4 publications).

Key weaknesses of Green Vehicles research outputs and outcomes

- Green Vehicles publications were 30% less likely to have received at least one journalistic mention than the expected level (0.7). This performance put them below both other SC4 publications (with a share more than twice the expected level of publications to have received journalistic coverage, 2.3) and the EU27 average (1.5).

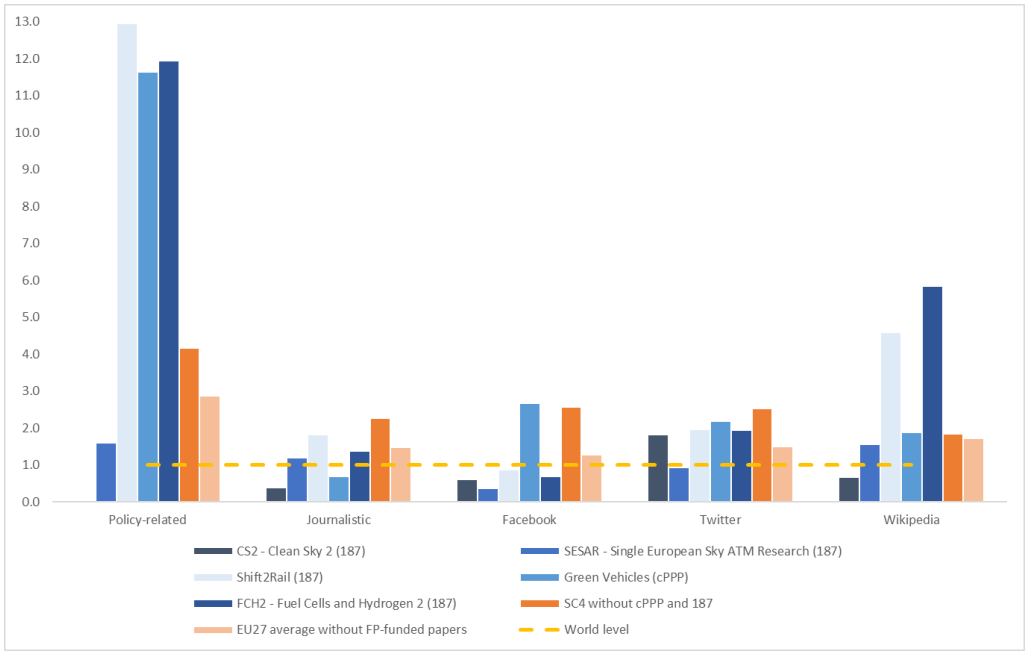

Figure 8: Policy-related, and altmetrics mentions profiles, Societal Challenge "Smart, Green And Integrated Transport" cPPP and article 187 partnerships, (2014-2021)

Source: Science-Metrix/Elsevier using data from Scopus (Elsevier), eCorda, PlumX and Overton

8.3.2. Partnership calibre analysis

8.3.2.1. Notes on interpretation of the partnership calibre analysis

The KIP monitoring framework[20] recommends that scientific outputs such as journal publications or citations towards these publications be evaluated *no earlier than two years after the supported projects of interest have been completed*. On this basis, as of autumn 2023, it is not appropriate, nor is the necessary data even available, to conduct a bibliometrics evaluation exercise of Horizon Europe journal-publication-mediated scientific outputs.

To measure instead enabling factors of Horizon Europe effectiveness, a so-called calibre analysis can be performed on the prior scientific achievements of researchers involved in projects selected for Horizon Europe funding. Cluster 5 researchers' prior publications (from 2017 to 2021) were retrieved to establish their track records on dimensions such as academic-private co-publication, cross-disciplinarity, or scientific excellence (proxied through citation impact), among others. It was hypothesised that Horizon Europe funding competitions should select, for example, researchers with past experience in conducting cross-disciplinary research, as a mechanism to increase the likelihood that societal impacts will be realised from supported projects.

One important limitation of this approach is that past achievements are no guarantee of continued performance; and that successful funding instruments may in fact succeed in greatly changing researchers' past practices towards improved practices. Therefore, the calibre analysis does not obviate the need for future monitoring and evaluation, but it can provide a baseline against which to measure future developments and help focus future on areas that might require particular improvement and/or monitoring.

[20] Directorate-General for Research and Innovation. (2022). Study to support the monitoring and evaluation of the Framework Programme for research and innovation along Key Impact Pathways - Indicator methodology and metadata handbook. Brussels: European Commission.

The calibre analysis of researchers now active in Cluster 5 destinations, intervention areas, action types, or partnerships has been performed using the same set of indicators as used in phase 1 of this evaluation. They have been applied to the set of 2017-2021 publications by researchers identified as now active in Cluster 5 and Cluster 6 projects, including partnership projects.

To help differentiate these past achievements by Cluster 5 and Cluster 6 researchers, benchmarks have been assembled as follows:

- **EU27+UK overall**: all 2017-2021 GT publications with at least one EU27 or UK affiliation, but excluding FP-supported articles

- **LERU**: all 2017-2021 GT publications with at least one affiliation with an institution that is part of the League of European Research Universities, but excluding FP-supported articles

- **EU27+UK industry**: all 2017-2021 GT publications with at least one EU27 or UK private sector affiliation, but excluding FP-supported articles

By definition, EU27+UK industry researchers have a strong academic-private co-publication score. Therefore, the benchmark should not be used on this specific indicator.

For the three altmetric indicators used here (citation from online policy-related documents, Wikipedia mentions, and trade and journalistic news outlets mentions), a new normalisation method is being rolled out as part of Phase 2 work. Indeed, for each altmetric finding, a custom synthetic world level (often referred to as the "expected") is provided. Synthetic world levels are the average level of publications with one or more altmetrics mentions in equivalent (in terms of disciplinary distribution) global reference sets. These normalisation methods differ from normalisation methods commonly used for citation impact indicators to better control for effects associated with sparser altmetrics signals.

8.3.2.2. Pre-Horizon Europe track record of 2Zero researchers on dimensions that are enabling factors for project effectiveness

2ZERO researchers' track record on team diversity and societal readiness

- A share of 77% of 2Zero researchers' 2017-2021 publications were thematically aligned with the SDGs. This was much above the benchmarking range (45%-51%).

- Another strong feature in past research by 2Zero investigators was the share of academic-private co-publications at 21%. This compared to 9% at LERU level and 7% at EU27+UK overall level.

- 2ZERO researchers' past research was on par with the benchmarks for the two cross-disciplinarity indicators.

- 2Zero investigators' prior publications included a lower or much lower share of international co-publications than the benchmarks at 39%. This compared to an EU27+UK overall of 44%, and much higher levels in the other two benchmarks.

- The average share of authors that were women in 2Zero researchers' prior publications was much below the benchmarks at 22%, against 33% in the next closest benchmark (EU27+UK industry at 33%).

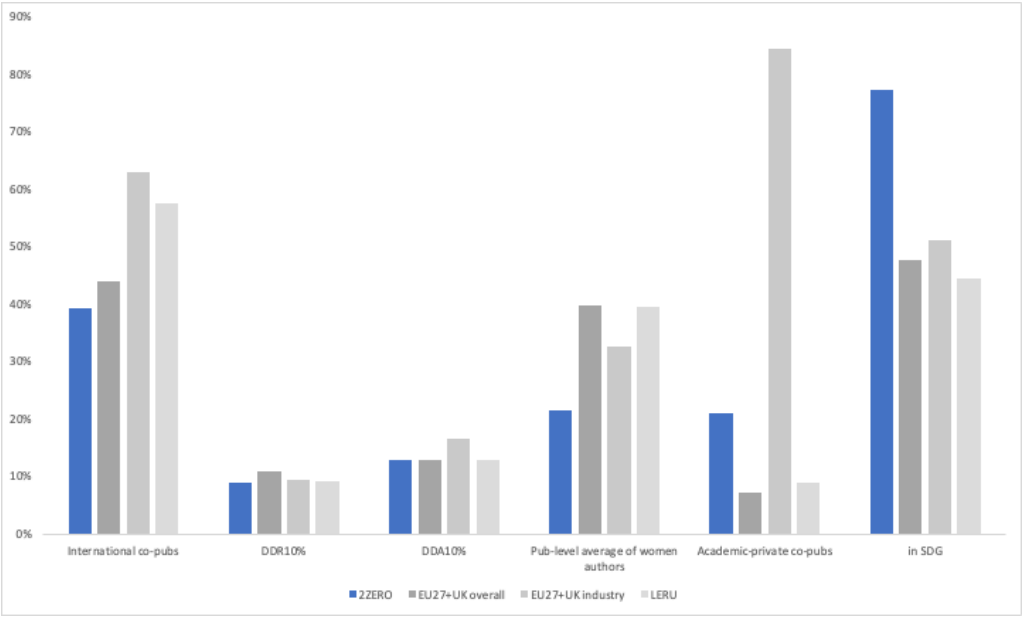

Figure 9: Pre- Horizon Europe track record of 2Zero researchers on selected dimensions of diversity and societal readiness of research teams (2017-2021)

Note: DDR10%: share of publications amongst the top decile of publications with most disciplinary diversity in references (i.e., most interdisciplinary) in their subfield, year and document type. DDA10%: share of publications amongst the top decile of publications with most disciplinary diversity in authorships (i.e., most multidisciplinary) in their subfield, year and document type.

Source: Scopus, NamSor and eCorda databases processed by Science-Metrix

2ZERO researchers' track record on citation impact as proxy for scientific excellence and leadership

- 2Zero researchers registered a good track record of scientific excellence, particularly on the Citation distribution index indicator that is well-rounded and provides a balanced view of citation impact across the full set of publications. Their 2017-2021 Citation distribution index was 17.6, well above the LERU level of 12.4.

- Citation impact was comparable to the highest benchmarks on the other two citation impact indicators, the Average of relative citations and Highly cited publications 10%, which are more susceptible to being skewed by high impact outlier publications.

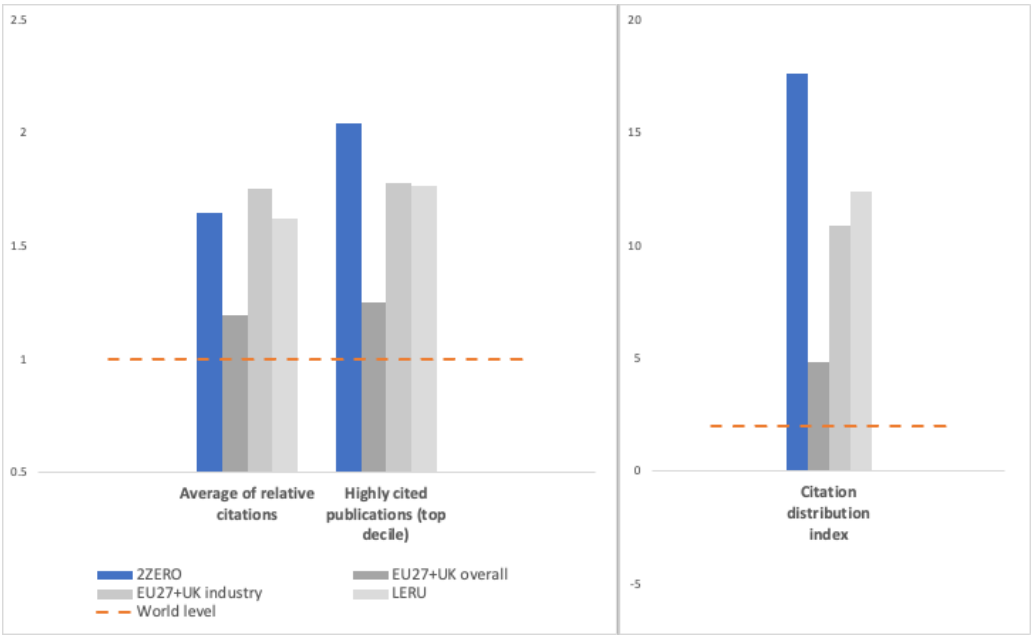

Figure 10: Pre- Horizon Europe track record of 2Zero researchers on citation impact (2017-2021)

Source: Scopus and eCorda databases processed by Science-Metrix

2ZERO researchers' track record on online dissemination capacity, including Open Access and online policy-related uptake

- 2Zero investigators' track record on online policy-related citations towards their publications was impressive, 6.9 percentage points above the expected level of 3.0%.
- On dimensions of mentions from Wikipedia and trade and journalistic outlets, 2ZERO researchers' track record was below LERU and EU27+UK industry levels and closer to EU27+UK overall average.
- 2Zero researchers' track record on Open Access publishing was below the three benchmarks at 54%, compared to 65% at EU27+UK overall level.

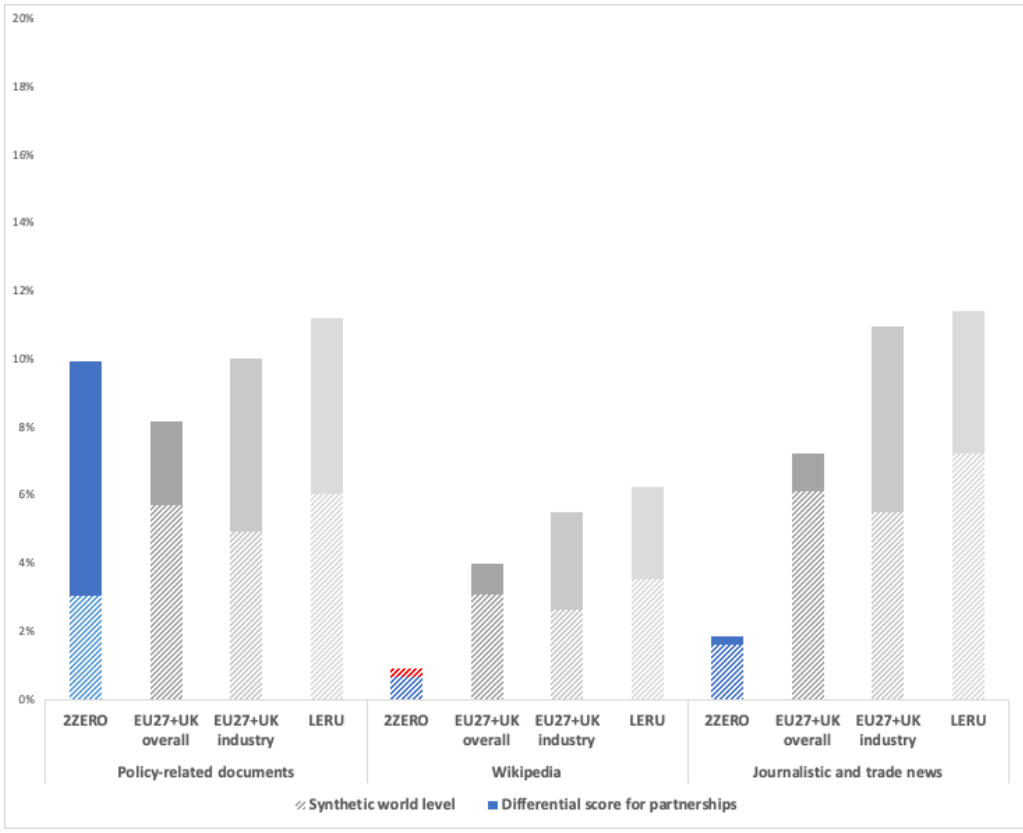

Figure 11: Pre- Horizon Europe track record of 2Zero researchers on selected online dissemination dimensions (2017-2021)

Note: Synthetic world levels are the average level of publications with one or more altmetrics mentions in equivalent (in terms of disciplinary distribution) global reference sets. Comparisons with benchmarks should be made on the differential scores (represented by the full bar sections as opposed to the stripped sections representing the synthetic world level). Differential scores are presented in red where they are negative, that is, below the expected world level.

Source: Scopus, PlumX, Overton and eCorda databases processed by Science-Metrix

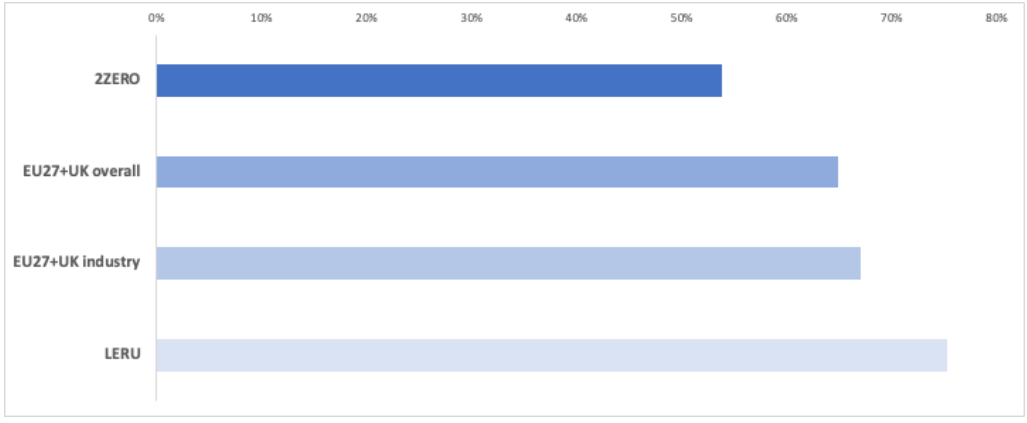

Figure 12: Pre- Horizon Europe track record of 2Zero researchers on OA publishing (2017-2021)

Source: Scopus, Unpaywall and eCorda databases processed by Science-Metrix

8.3.3. Survey Results

For **Cluster 5 Climate, Energy and Mobility** two surveys have been analysed:

- "Survey of Horizon Europe beneficiaries, conducted in May-July, 2023" (successful applicants survey);
- “Survey of Horizon Europe unsuccessful applicants, conducted in May-July, 2023” (unsuccessful applicants survey);

For 2Zero the successful applicants survey data has been filtered according to matched data with CORDA.

The analysis is organised by evaluation criteria – efficiency, coherence/synergies, relevance/motivation to apply, effectiveness and EU added value – and includes the respective graphs. Firstly, the results for 2Zero respondents are represented, followed by results for Cluster 5 overall.

The captions of the graphs are identical with the questions of the survey. Whenever relevant, similar questions for successful and unsuccessful applicants are presented after each other for better juxtaposition.

8.3.3.1. Number of respondents

Respondents for 2Zero come from 15 countries. The biggest share of the respondents (12.8%) is from Spain and Germany, followed by the Netherlands (10.3%). Respondents from Czechia, Austria, Portugal, Belgium and Turkiye make up 7.7% of the respondents. A small share of the respondents (2.6%) are based in the UK, Greece, Poland, Ireland, Denmark and Italy.

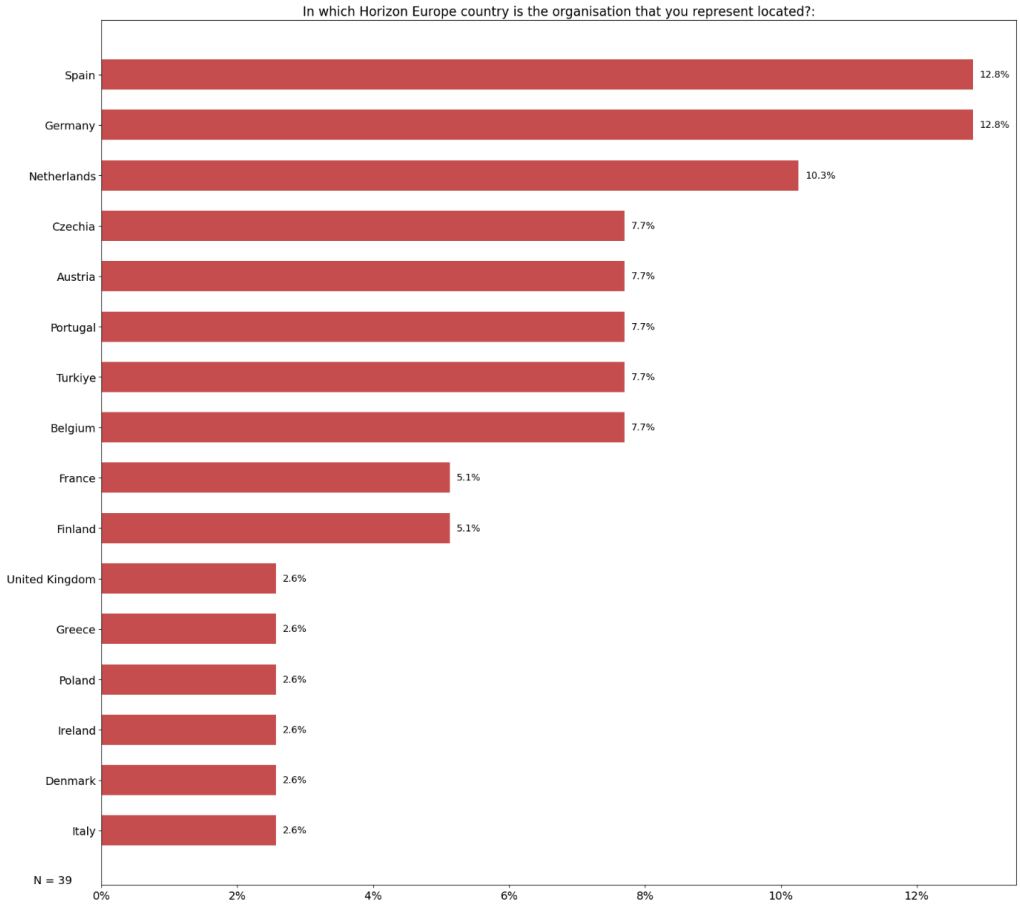

Figure 13: In which Horizon Europe country is the organisation that you represent located?

In total, the Cluster 5 survey received 963 answers from successful applicants including 772 complete ones and 191 partial ones[21].

8.3.3.2. Efficiency

the following shows the satisfaction with administrative and management processes of HE projects. 2Zero respondents strongly agree and rather agree to the highest extent with the statements that 'the time of the process up to signature is adequate' (59%), 'expenditure eligibility requirements are clear' (56%) and that 'project reporting requirements require reasonable efforts and cost' (56%). On the other hand, the strongest disagreement (strongly and rather disagree) is about the statement that 'the burden of administrative and legal requirements for granting procedures were proportionate' (31%) and that the 'online reporting platform is user-friendly' (18%). Consistently a big share of the respondents (between 15% and 35%) neither agree nor disagree with the statements.

[21] Results for Cluster 5 are taken from the Second Interim Report, Annex E.

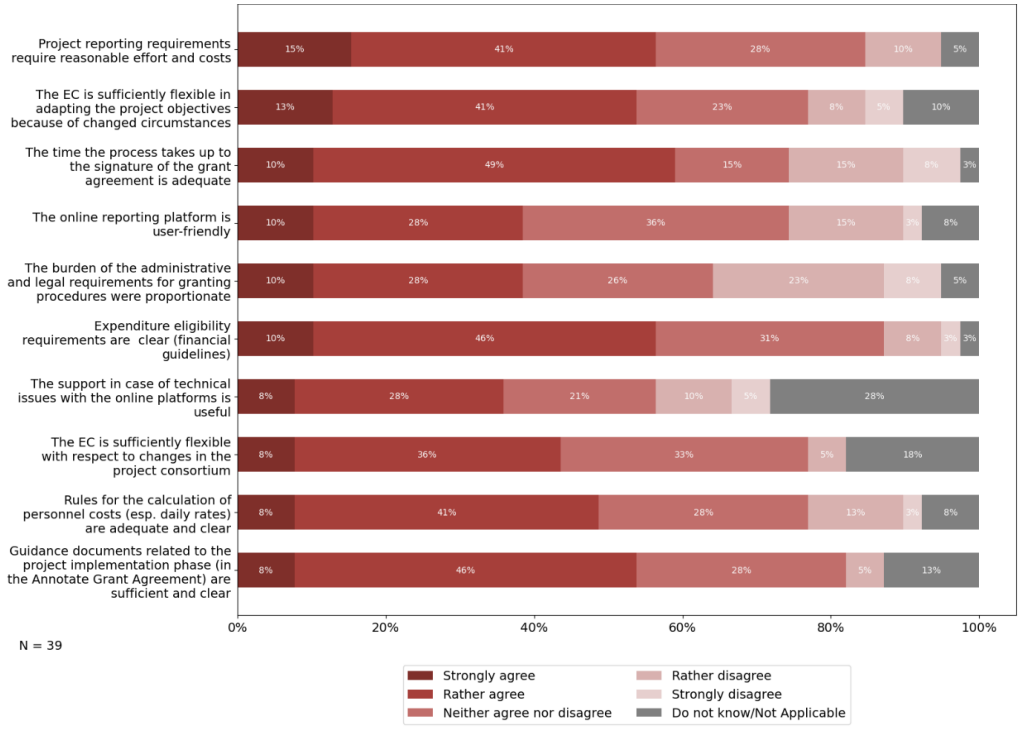

Figure 14: Would you agree or disagree with the following statements about the administrative and management processes in your Horizon Europe project? (2Zero)

For Cluster 5, 67% of the respondents strongly agree and rather agree with the statement that the time the process takes up to contract signature is adequate. Respondents are least satisfied with the usefulness of the support in case of technical issues provided by the platform (34%). For all other issues satisfaction varies between 45% and 60%. Dissatisfaction is the highest (17%) with the proportionality of the burden of administrative requirements for the granting procedure.

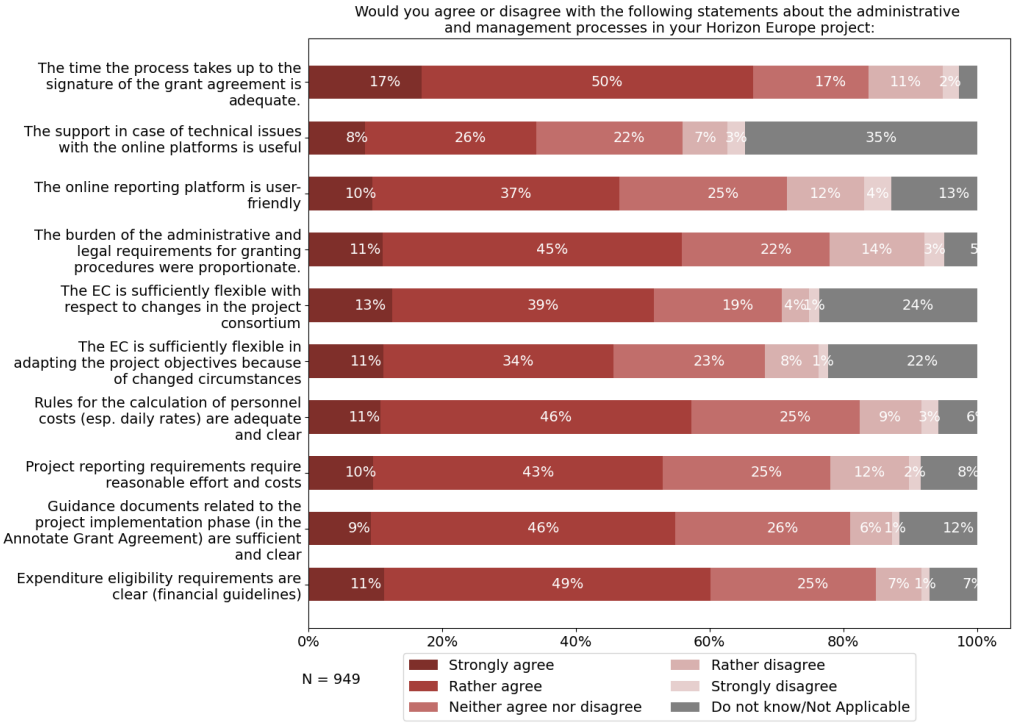

Figure 15: Q7: Would you agree or disagree with the following statements about the administrative and management processes in your HE project? (Cluster 5 in total)

The following two figures show the satisfaction with the efforts needed to prepare and submit a HE proposal. Over half of 2Zero respondents (59%) agree, to a large and very large extent, that the efforts needed to prepare and submit the proposal are proportionate to the complexity of the proposed project. It is followed by two statements (54%): the application costs are proportionate to the volume of funding, and the overall effort to prepare a HE project was acceptable. The biggest share of respondents who do not agree at all or agree to a small extent (28%) is with the statement that the 'efforts needed were in proportion to the chances of securing a HE funding'.

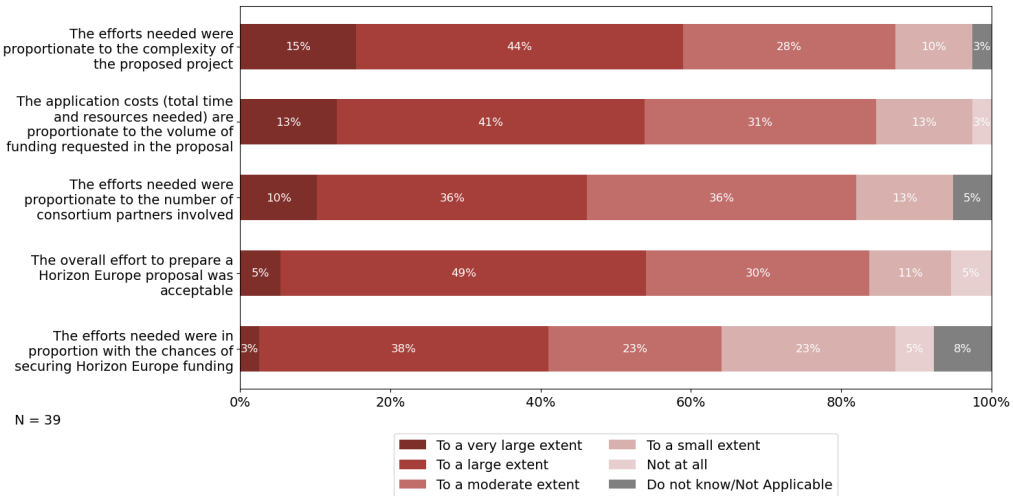

Figure 16: To what extent do you agree with the following statements about the effort needed to prepare and submit your Horizon Europe project? (2Zero)

Cluster 5: The following two figures show the satisfaction with the efforts needed to prepare and submit a HE proposal - successful and unsuccessful projects. The satisfaction of successful project is the highest with the efforts needed being proportionate to the number of consortium partners (60%) and efforts needed being proportionate to the complexity of the proposed project (60%). These figures were slightly lower for unsuccessful projects (51% and 54%).

Successful applicants were the least satisfied (22% of to a small extent and not at all answers) with the efforts needed being proportionate to the chance of securing funding. Understandably, the level of dissatisfaction of unsuccessful applicants on this was more than twice higher (51%). Moreover, 32% of unsuccessful applicants do not believe that the effort to prepare a HE proposal is acceptable.

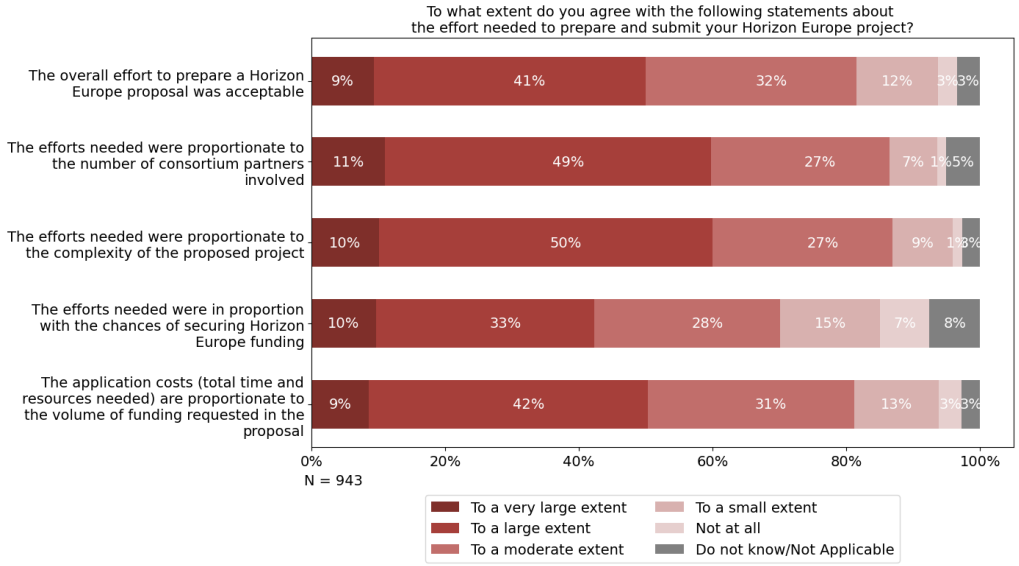

Figure 17: Q9: Would you agree or disagree with the following statements about the effort needed to prepare and submit your HE project? (successful projects, Cluster 5 in total)

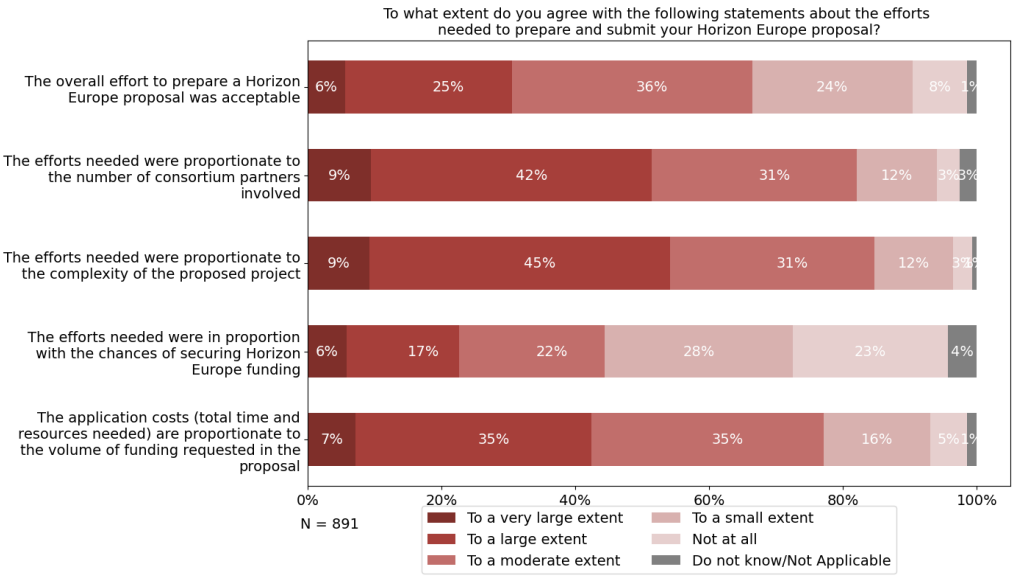

Figure 18: To what extent do you agree or disagree with the following statements about the effort needed to prepare and submit your HE project? (unsuccessful projects, Cluster 5 in total)

The following shows the estimation of successful applicants on the percentage share spent on administrative tasks. For 2Zero the biggest share of participants (33.3%) estimate they spent between 6-10% from their HE project budget on administrative tasks. It is followed by those (25.6%) who consider that between 11-15% are spent on administrative tasks. Some 12.8% think that 16-20% are spent on administrative tasks, and almost a quarter (23.1%) consider that costs are no higher than 5%.

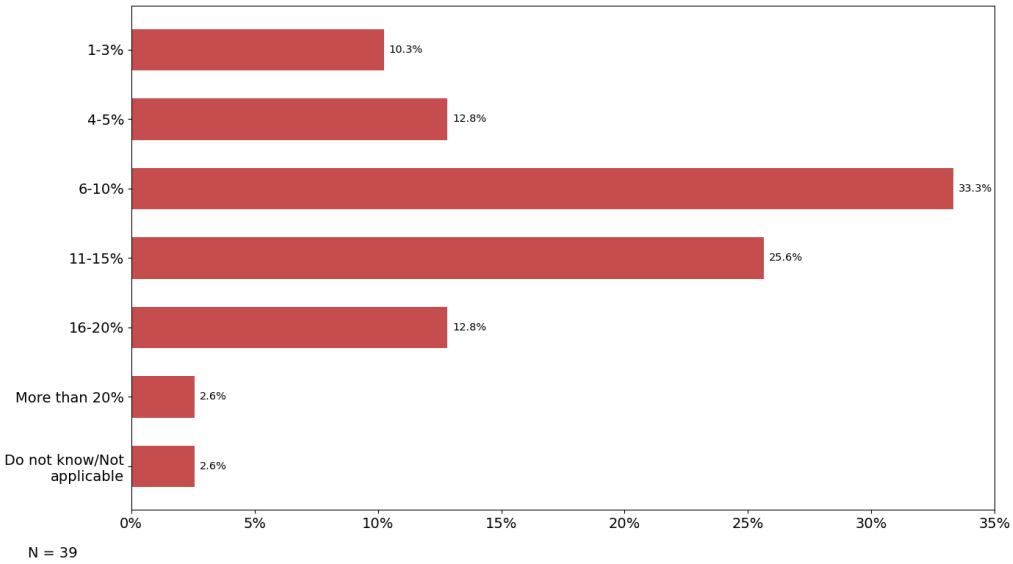

Figure 19: In your estimation, what is the percentage share of your Horizon Europe project budget that is spent on administrative tasks (e.g. project reporting, project financial management, and similar)? (2Zero)

For Cluster 5 the highest share of respondents (27.8%) believe that the figure is 6-10% of the budget. It is followed by 18.3% of responses estimating it at 4-5% and 18% - at 11-15%. A total of 18.6% consider that the more than 16% are spent on administration.

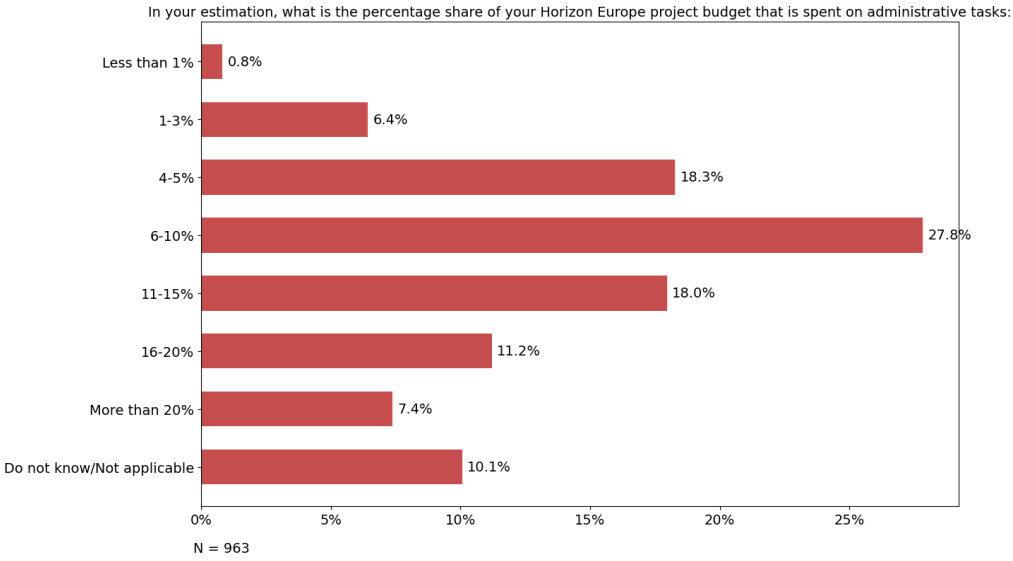

Figure 20: Q12: In your estimation, what is the percentage share of your HE project that is spent on administrative tasks? (Cluster 5 in Total)

The following figure shows the experience of the applicants in previous Framework Programme (Horizon 2020). 41% of 2Zero respondents previously participated in a

Framework Programme. 17.9% previously participated as both a coordinator and a participant, while only 2.6% previously participated as a coordinator of a consortium. One third of respondents (33%) had not previously participated in or coordinated a Framework Programme.

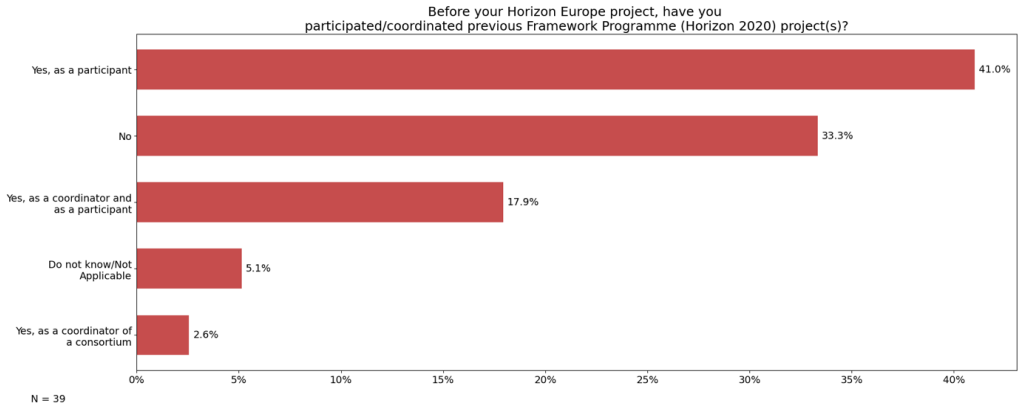

Figure 21: Before your current Horizon Europe project, have you personally participated/coordinated previous Framework Programme (Horizon 2020) project(s)? (2Zero)

Cluster 5: The following two figures show the experience of the applicants in previous Framework Programme (Horizon 2020) – successful and unsuccessful projects. More than two thirds of successful projects have had previous experience – 47% as participants, 13% as coordinators and participants and 7.1% as coordinators. The figure is even higher for unsuccessful projects – 73.6%. On one hand we can conclude that previous experience does not guarantee success. On the other hand, it is obvious that there is a rate of renewal and that participants who have been successful in the past work on new projects.

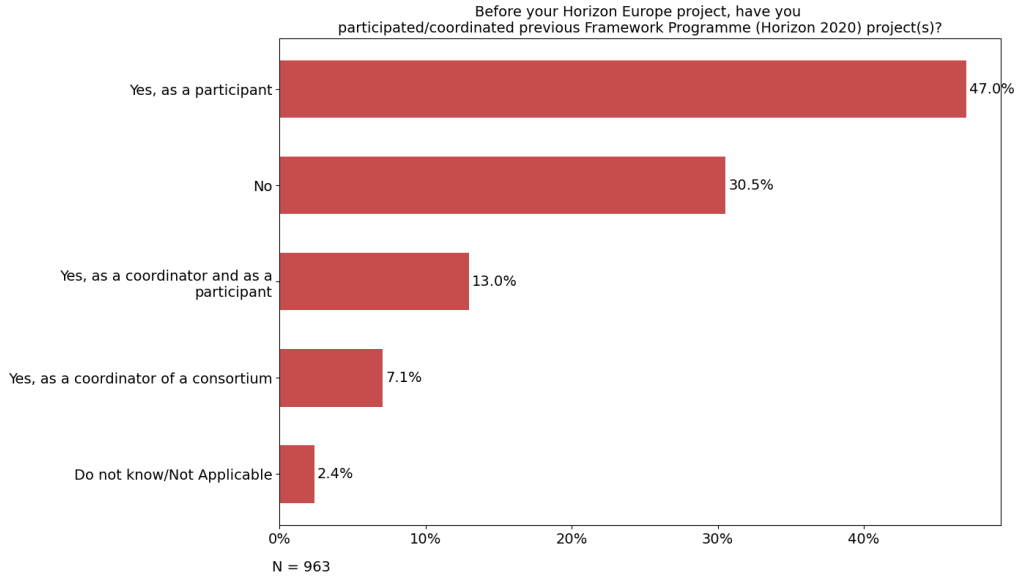

Figure 22: Before your HE project, have you participated/coordinated previous Framework Programme (Horizon 2020) project(s)? (successful projects) (Cluster 5 in total)

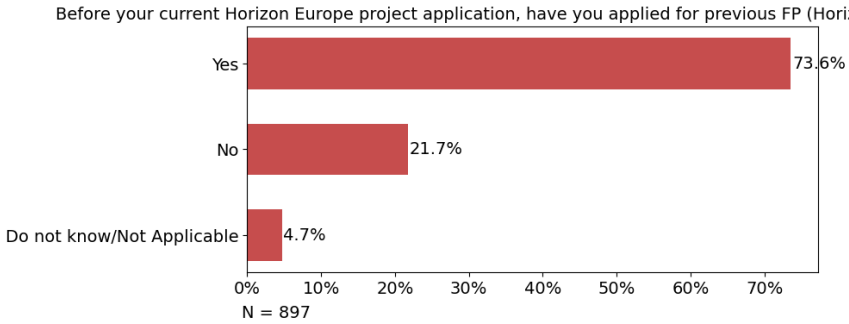

Figure 23: Before your HE project, have you applied for previous Framework Programme (Horizon 2020) project(s)? (Unsuccessful projects, Cluster 5 in total)

8.3.3.3. Coherence/synergies

The following shows for 2Zero if the successful applicants applied for additional funding for research ideas and activities addressed in the HE project. A large majority of 2Zero respondents (77.8%) did not apply for any additional funding. Only 8.3% applied for national or regional funding, and 5.6% applied for other funding.

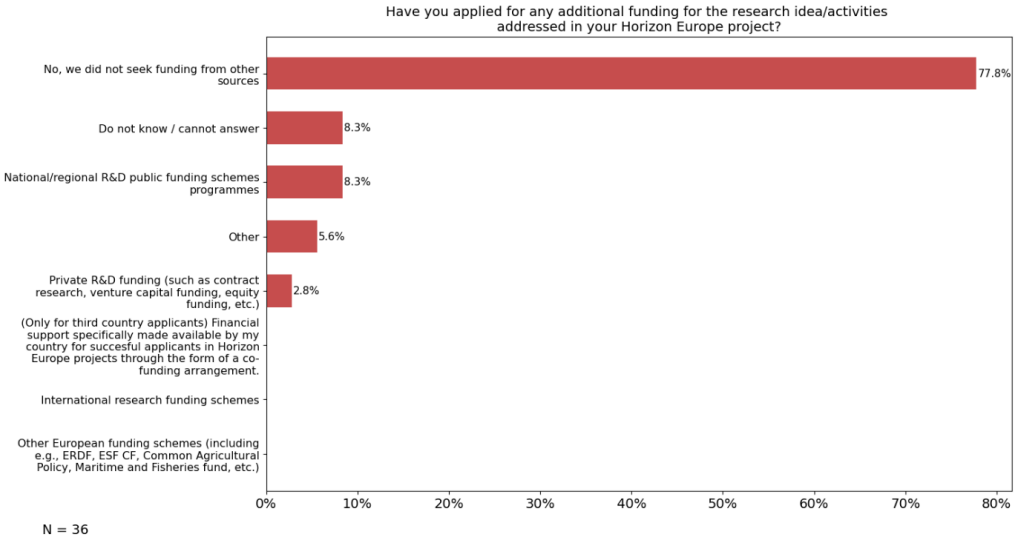

Figure 24: Have you applied for any additional funding for the research idea/activities addressed in your Horizon Europe project? (2Zero)

The following shows for Cluster 5 if the successful applicants applied for additional funding for research ideas and activities addressed in the HE project. Almost 70% of the respondents did not seek any additional funding. One quarter of respondents sought different types of additional funding out of which national/regional research funding comes first with 13.6%.

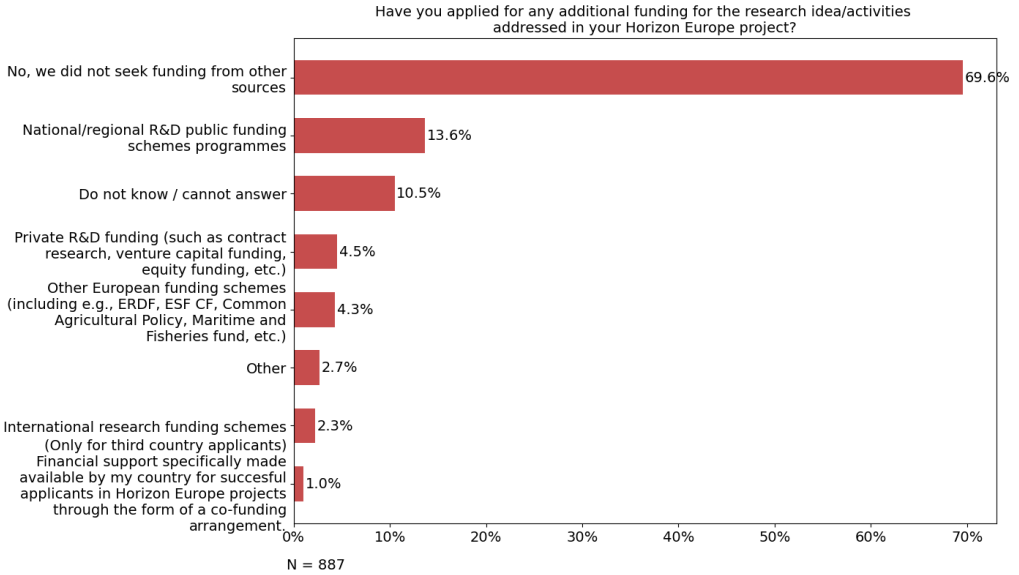

Figure 25: Have you applied for any additional funding for the research idea/activities addressed in your HE project? (Cluster 5 in total)

The following shows the level of collaboration with other HE programmes or clusters. Half of the 2Zero respondents (50%) did not have any joint activities with projects funded under other HE programmes/clusters. The other half of respondents collaborated mainly with Pillar II – Cluster 5 (50%). Some collaboration has taken place with 'Pillar I - Maria Sklodowska' as well as 'Widening participation and spreading excellence' and Cluster 4.

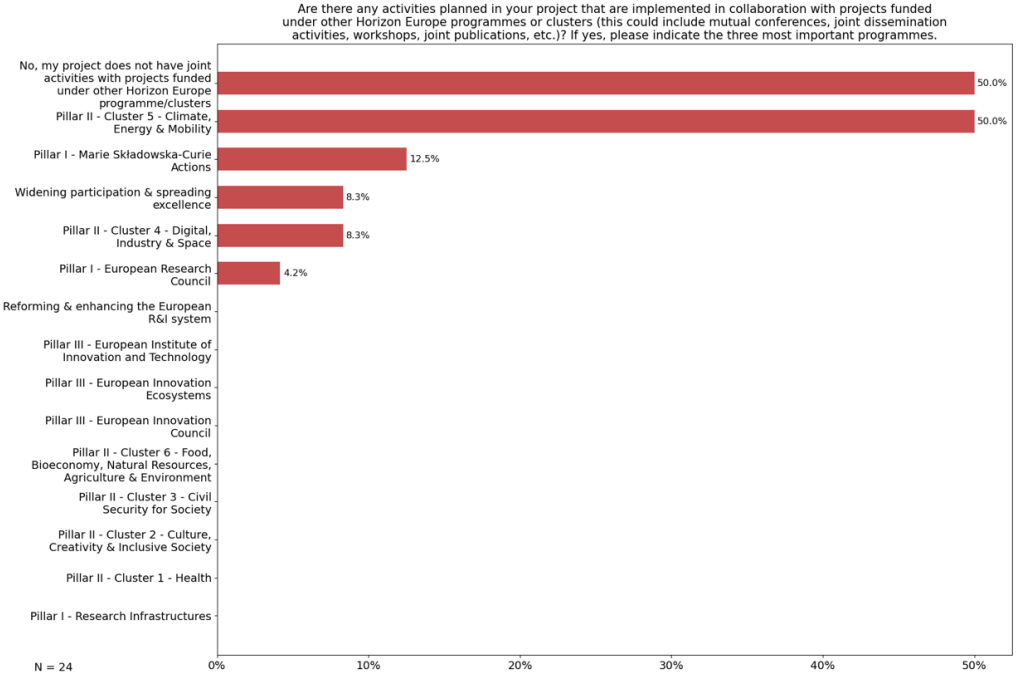

Figure 26: Are there any activities planned in your project that are implemented in collaboration with projects funded under other Horizon Europe programmes or clusters (this could include mutual conferences, joint dissemination activities, workshops, joint publications, etc.)? If yes, please indicate the three most important programmes. (2Zero)

For Cluster 5, the following shows the level of collaboration with other HE programmes or clusters. More than half of the respondents (51.5%) do not have any joint activities with other HE programmes or clusters but 42.2% have joint activities with Pillar II – Cluster 5. A small share of the respondents (6.4% and less) have had joint activities with other HE pillars and clusters.

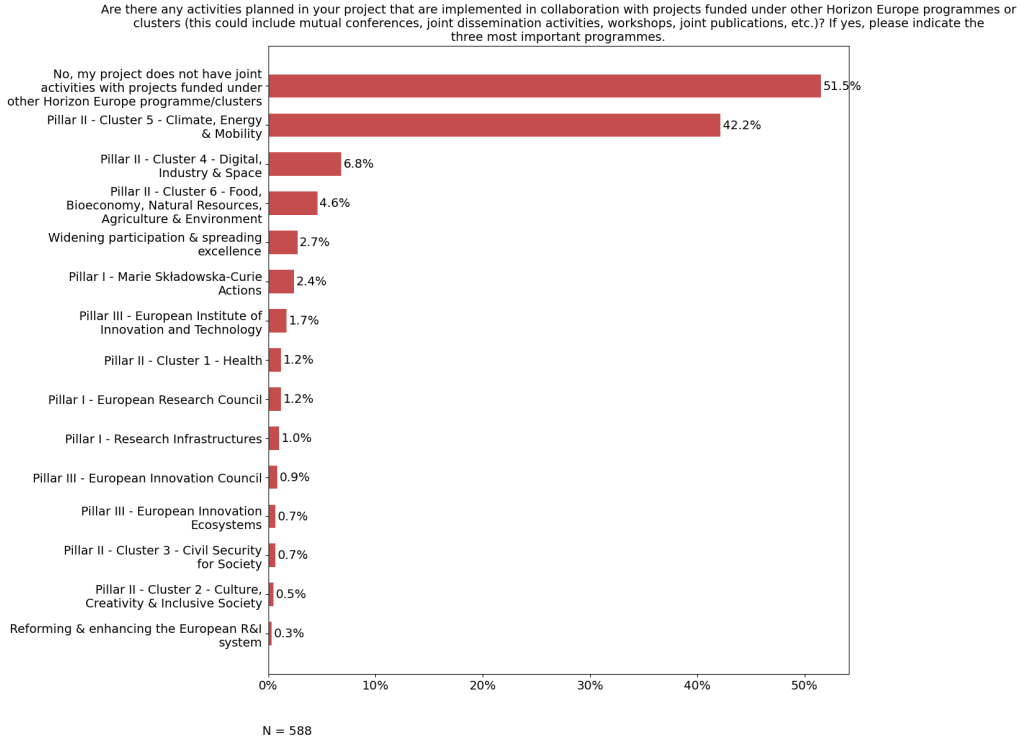

Figure 27: Are there any activities planned in your project that are implemented in collaboration with projects under other HE programmes or clusters (this could include mutual conferences, joint dissemination activities, workshops, joint publications, etc.). If yes, please indicate the three most important programmes? (Cluster 5 in total)

The following shows if the HE project is a continuation of research activities carried out under previous Framework programmes/other funding schemes. For more than half of 2Zero respondents (56.8%), their project is not a follow-up of previous projects. For 21.6% of respondents, their project is a continuation of a H2020 project. For 18.9% of the respondents, their project it is a continuation of nationally-funded projects.

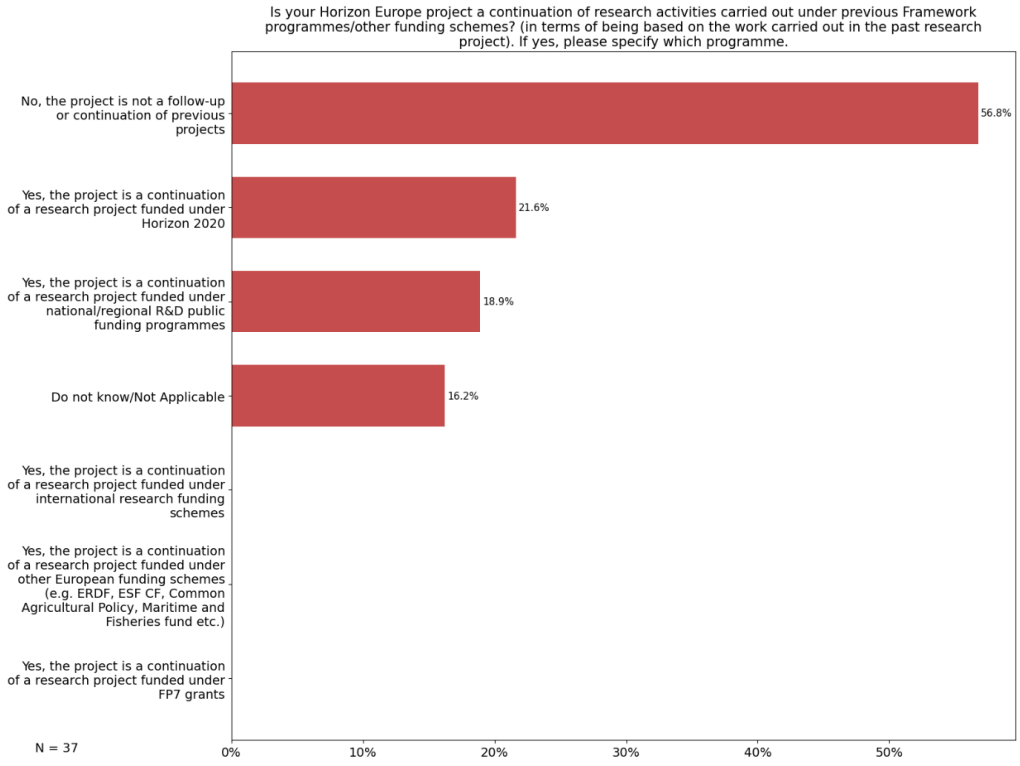

Figure 28: Is your Horizon Europe project a continuation of research activities carried out under previous Framework programmes/other funding schemes? (in terms of being based on the work carried out in the past research project). If yes, please specify which programme. (2Zero)

For Cluster 5 the following shows if the HE project is a continuation of research activities carried out under previous Framework programmes/other funding schemes. More than half (50.8%) of respondents have provided a negative answer while 14.8% do not know or the question is not applicable. For more than a third of the respondents the HE is a continuation of some previous research – H2020 (21%), national/regional research funding (7.8%), FP7 (3.1%), etc.

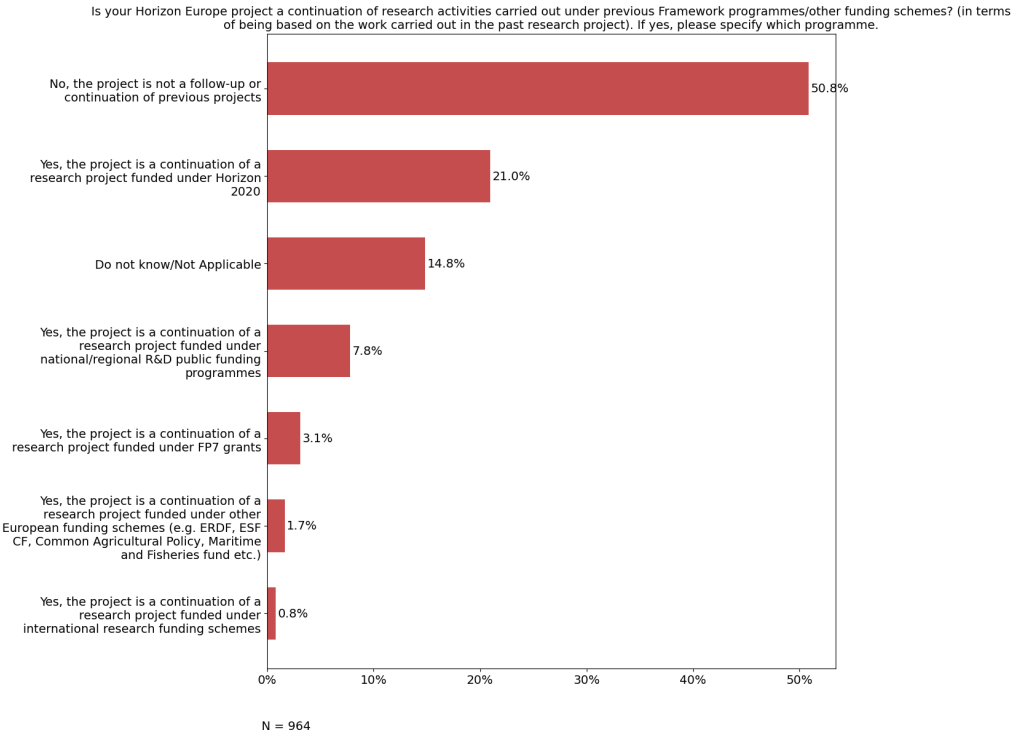

Figure 29: Is your HE project a continuation of research activities carried out under previous Framework programmes/other funding schemes? (in terms of being based on the work carried out in the past research project). If yes, please specify the programme. (Cluster 5 in total)

8.3.3.4. Relevance

The following shows to what extent the HE project responds to the need of the organisation. The majority of 2Zero respondents agree to a large and a very large extent that the HE project responds to the need of their organisation to reduce the environmental impact of their products, processes or services (67%) and to develop sustainable solutions contributing to a green transition (72%).

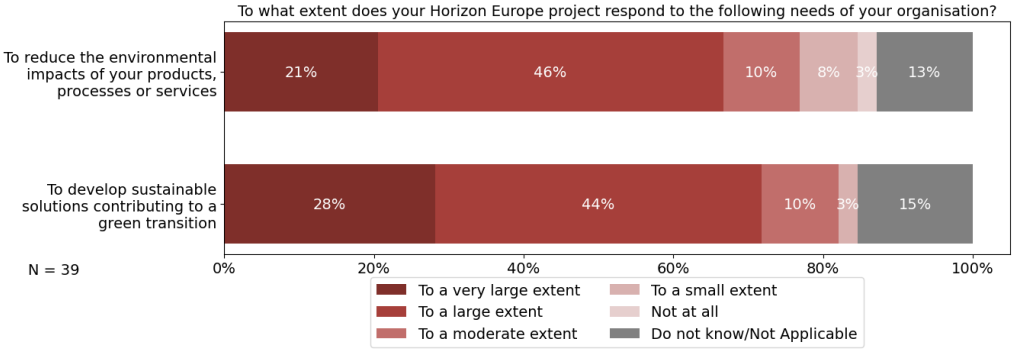

Figure 30: To what extent does your Horizon Europe project respond to the following needs of your organisation? (2Zero)

Cluster 5: The following two graphs show to what extent the HE project responds to the need of the organisation. The highest share of successful respondents consider that the project created or strengthened collaboration with leading research organisations (80% to a very large of large extent). Almost twice as little responses (41%) agree to a large and very large

extent that the HE project contributes to the environmental impact of products, processes or services. At the same time, more than 2/3 of the responses (68%) consider that the HE projects contributes to the development of new solutions contributing to the Green Transition.

For unsuccessful applicants, the HE project responds to the highest extent to the need to create or strengthen collaboration with leading research organisations (69% to a very large of large extent). S1/3 of the responses (33%) agree to a large and very large extent that the HE project contributes to the environmental impact of products, processes or services. At the same time, 54% of the respondents consider that the HE projects contributes to the development of new solutions contributing to the Green Transition which is lower than the 68% for successful projects. Hence, it could be concluded that successful projects have slightly better green transition credentials that unsuccessful ones.

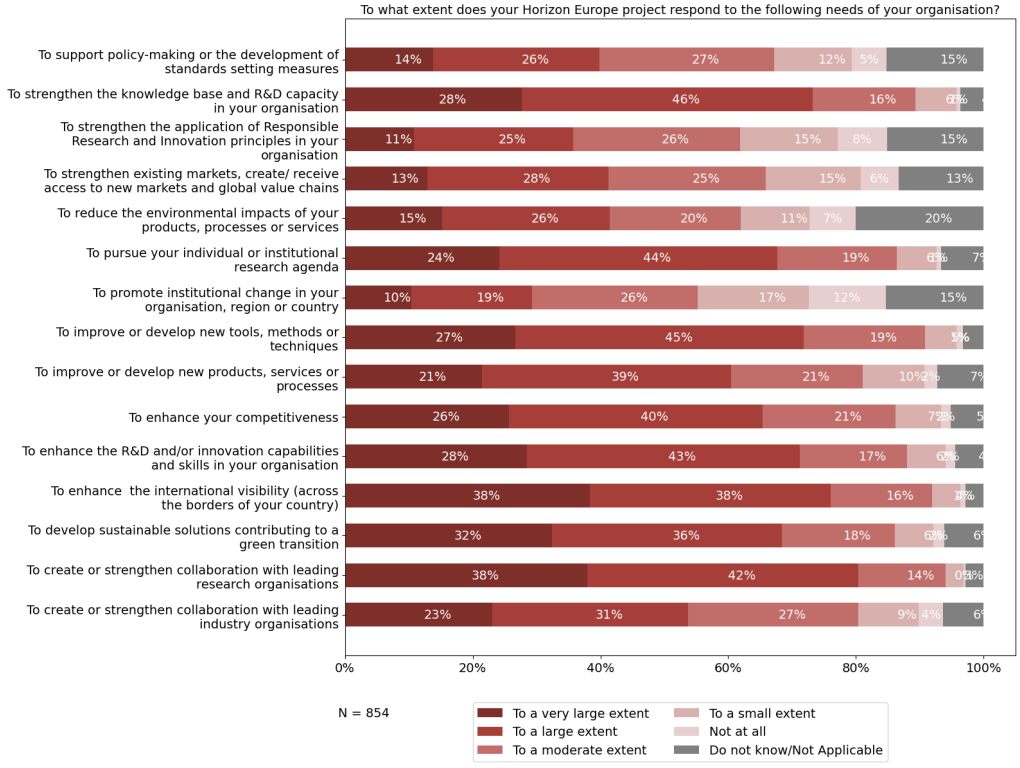

Figure 31: Q24 To what extent does your HE project respond to the following needs of your organisation? (successful applicants, Cluster 5 in total)

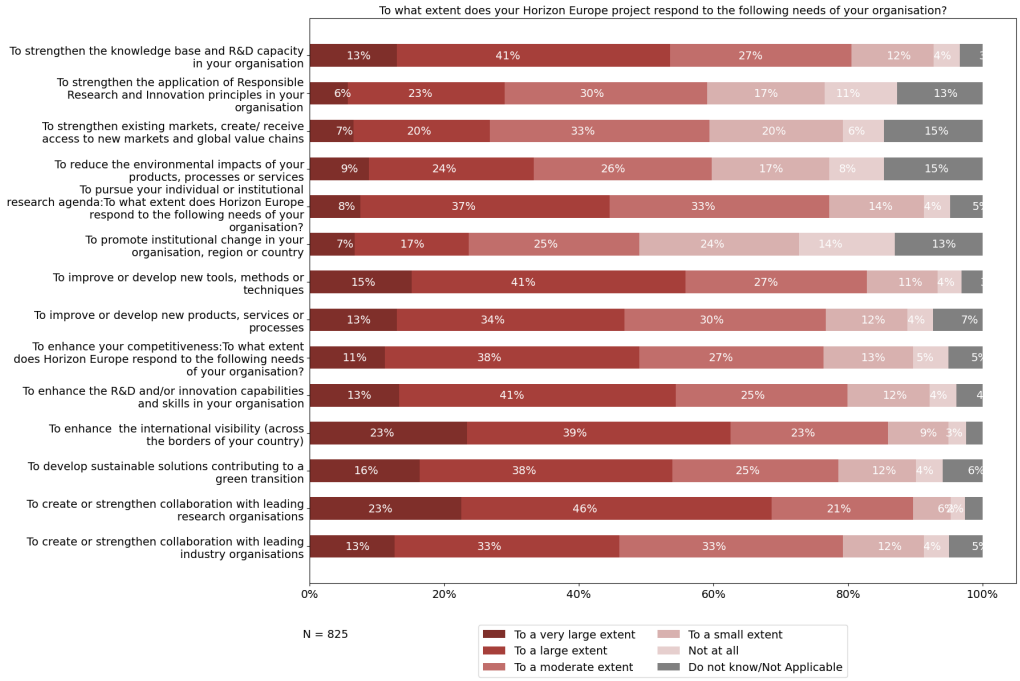

Figure 32: To what extent does your HE project respond to the following needs of your organisation? (unsuccessful applicants, Cluster 5 in total)

8.3.3.5. Effectiveness

In terms of outputs to be produced as a result of the HE project, the biggest share of the 2Zero respondents indicated ‘testing, demonstration and piloting’ (75%) followed in equal parts by ‘prototype’ and ‘research publications’ (69.4%). A consistent share (44.4%) of respondents indicated ‘new or improved products, services or processes’, ‘new or improved tools, methods or techniques’, ‘recommendations for policy makers’, and ‘new or improved software, protocols/guidance’. On the other end of the spectrum, few respondents indicated ‘codes of conduct’ (5.6%), ‘social innovation’ (8.3%) and ‘setting up centres of excellence’ (8.3%).

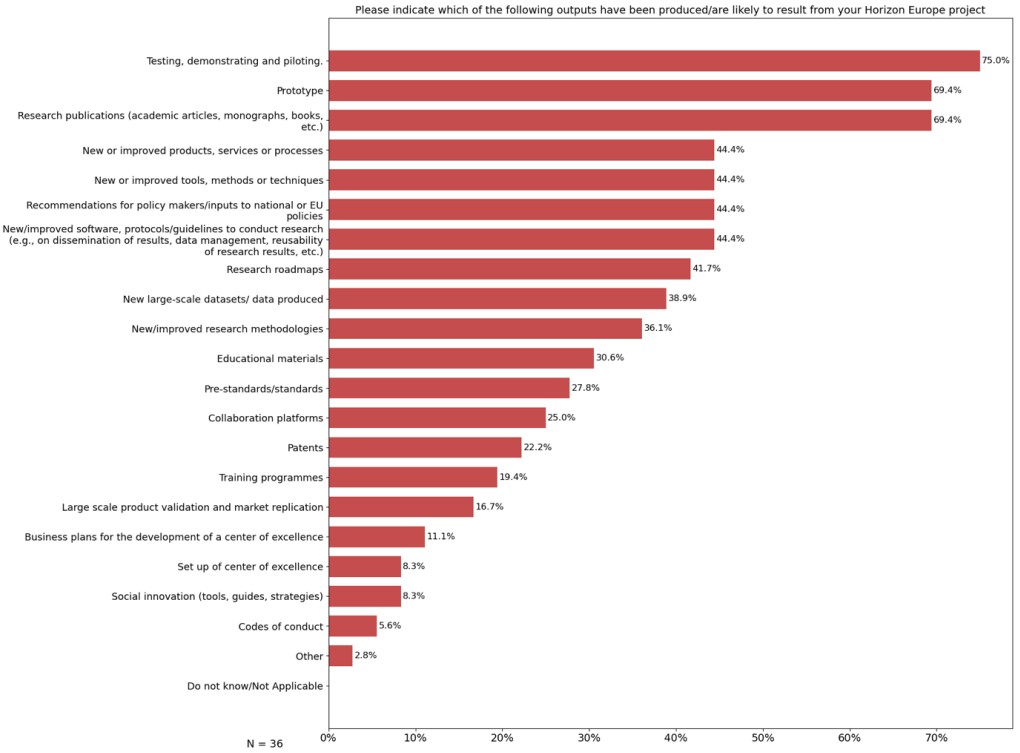

Figure 33: Please indicate which of the following outputs have been produced/are likely to result from your Horizon Europe project (please select all applicable answers): (2Zero)

For Cluster 5 the following shows the outputs that are the most likely to result from the HE project. More than 70% of the respondents answered that their HE projects would result in research publications (78.7%) and testing, demonstrating and piloting (68%). More than 50% of the respondents answered that their HE projects would result in recommendations for policy makers (56%) and new or improved tools, methods or techniques (54.1%). Very few respondents answered that their HE projects would result in centres of excellence (3.7%) and codes of conduct (4.8%). The other results were selected by between 9.4% for business plans for the development of centres of excellence and 47.4% for new large-scale datasets.

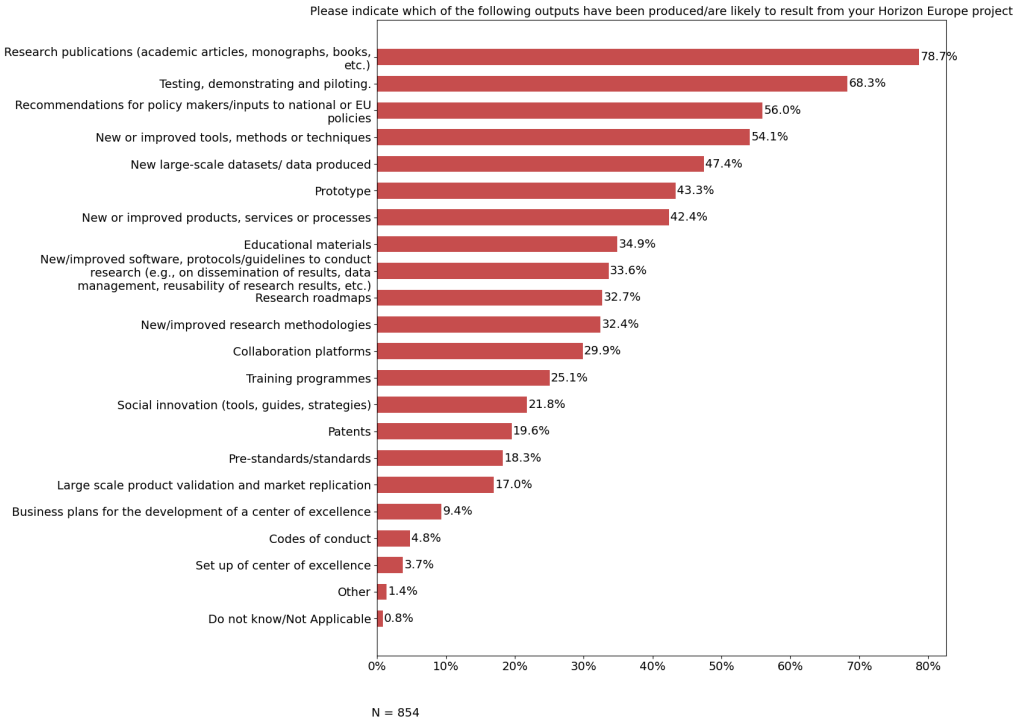

Figure 34: Q26 Please indicate which of the following outputs have been produced/are likely to result from your HE project? (Cluster 5 in total)

The following shows the results achieved or likely to be achieved by the projects in 2Zero. Some 86% of respondents consider to a large and very large extent that their project achieved or is going to achieve the development of sustainable solutions contributing to a green transition. It is followed by ‘strengthening the relations with leading partners in Europe’ (63%), ‘increasing the international visibility through collaboration with leading global partners’ (54%), and ‘improving the skills, knowledge and competence of the researchers’. Only 23% of respondents believe that their project is contributing to emerging areas of science and technology.

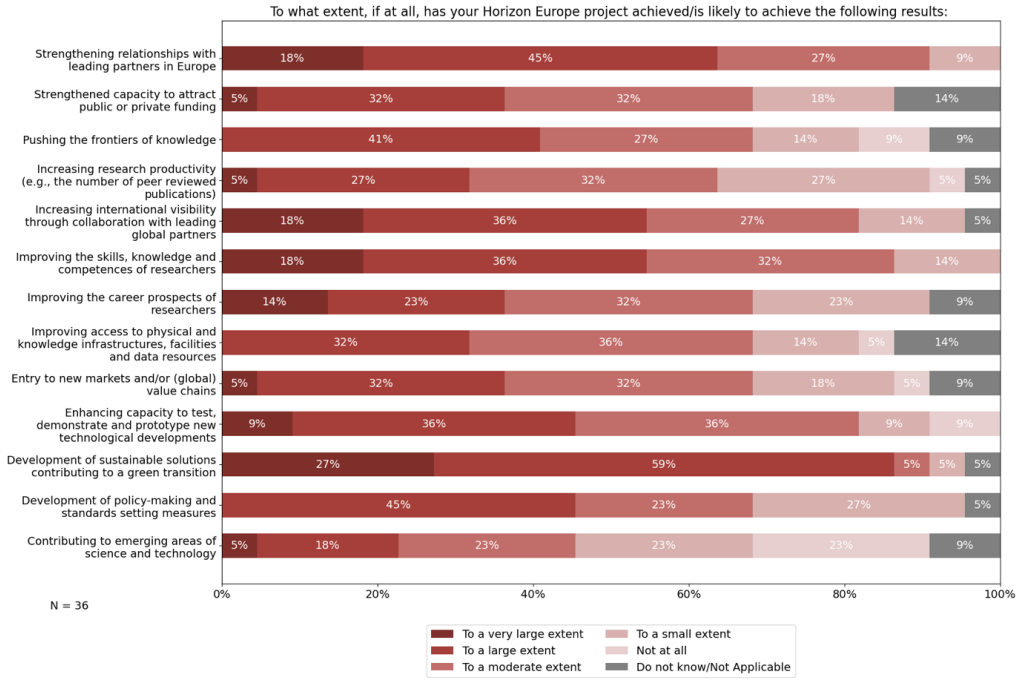

Figure 35: To what extent, if at all, has your Horizon Europe project achieved/is likely to achieve the following results:(2Zero)

The following shows the results achieved or likely to be achieved by the projects in Cluster 5. The result that is the most likely to be achieved is the strengthening of relationships with leading partners in Europe (76% agree to a very large or large extent). It is followed by improving the skills, knowledge and competence of researchers (73%) and the development of sustainable solutions contributing to a green transition (70%). The results that are the least likely to be achieved are entry to new markets and global value chains (32%) and developing of policy making and standard setting measures (42%).

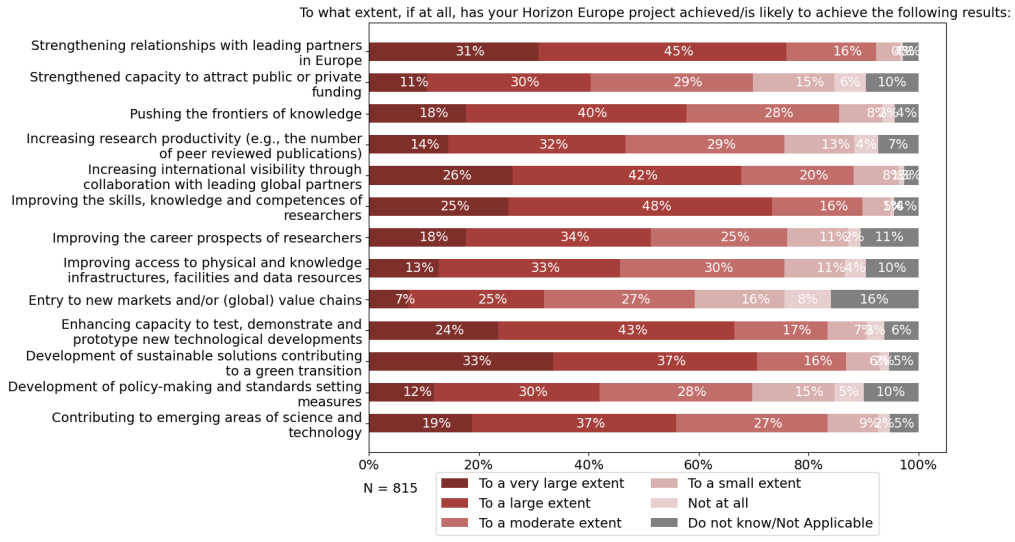

Figure 36: Q30 To which extent, if at all, has your HE project achieved/is likely to achieve the following results? (Cluster 5 in total)

The following shows for 2Zero to what extent the indicated barriers constitute challenges for project implementation. 26% (to a large and very large extent) suffered from a lack of administrative support within their organisations. This challenge is followed by 'the emergence of competing solutions outdating the project' (22%) and 'the Covid-19 pandemic and heavy research, teaching and managerial overloads' (16%). Withdrawal of one consortium partner has been a challenge to only 6% of the respondents.

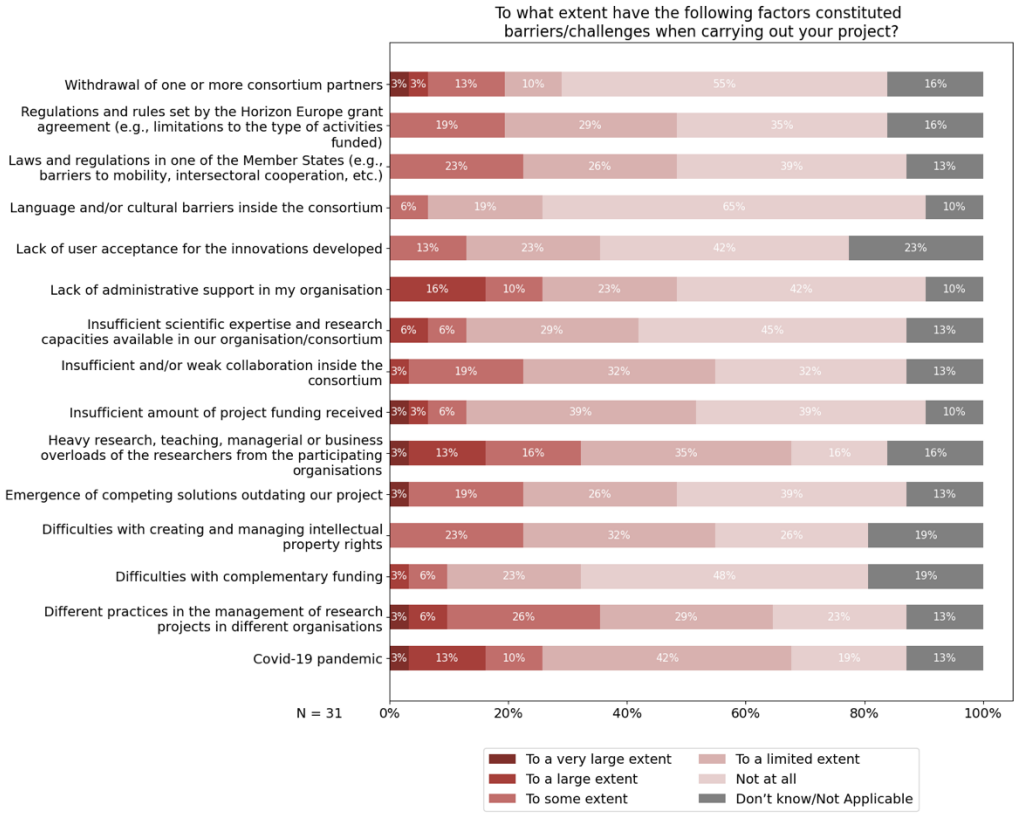

Figure 37: To what extent have the following barriers constituted challenges when carrying out your project? (2Zero)

Cluster 5 overall: The following shows to what extent the indicated barriers constitute challenges for project implementation. If the first three levels of response (to a very large, large and to some extent) are added up then the factor 'heavy research, teaching, managerial or business overloads of the researchers from the participating organisations' is recognised as the one constituting the biggest barrier (39%). It is followed by insufficient amount of project funding received (30%) and lack of administrative support in my organisation (28%). It has to be noted that for all factors a high share of the respondents chose the 'not at all' answer'.

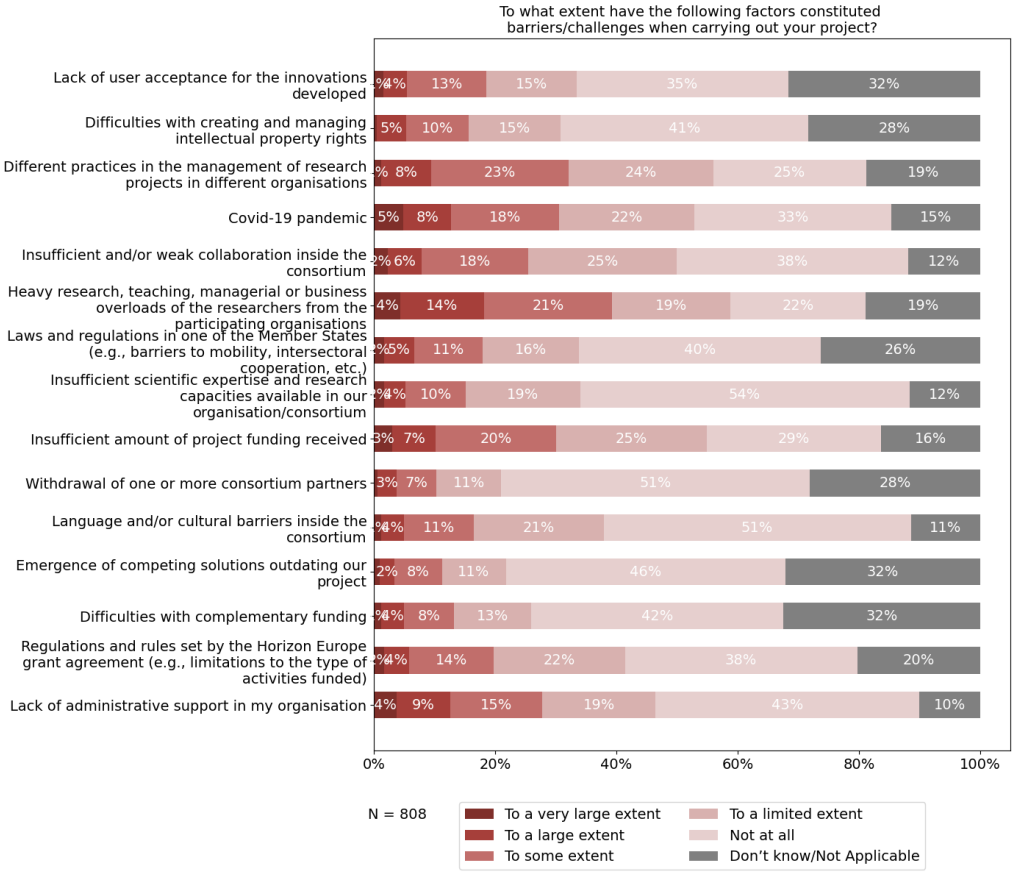

Figure 38; To what extent have the following barriers constituted challenges when carrying out your project? (Cluster 5 in total)

The following shows the exploitation activities foreseen as a part of 2Zero respondents' HE project. 61.3% of respondents indicated that they foresee the development, creating, manufacturing and marketing of a product or process as an exploitation activity. 38.7% of respondents foresee standardisation activities, while 35.5% of respondents foresee using results for academic purposes. Only 3.2% foresee the establishment of spin-offs or start-up companies.

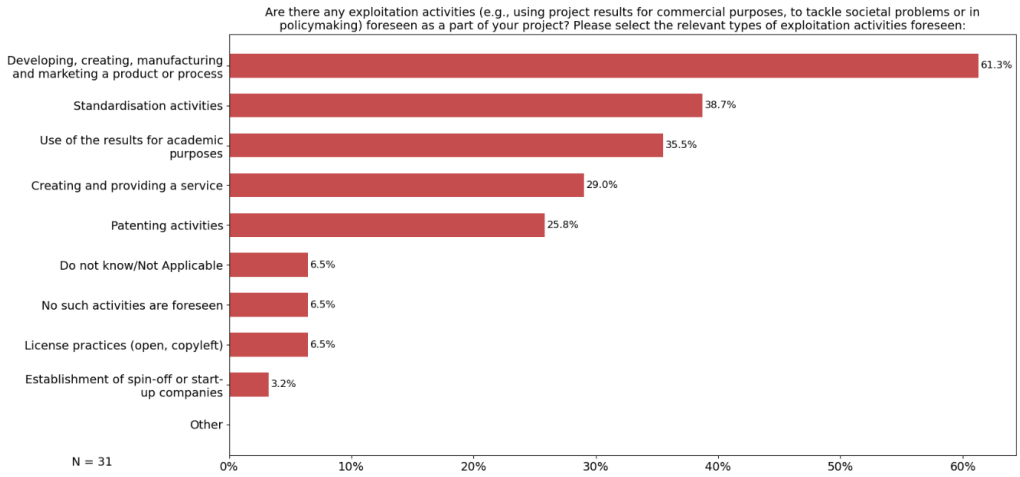

Figure 39: Are there any exploitation activities (e.g., using project results for commercial purposes, to tackle societal problems or in policymaking) foreseen as a part of your project? Please select the relevant types of exploitation activities foreseen: (2Zero)

For Cluster 5, the following shows the exploitation activities foreseen as a part of respondents' HE project. The highest number of respondents have foreseen the use of results for academic purposes (44.8% of respondents agree to a large or very large extent) followed by developing, creating and manufacturing and marketing a product or a service (38.6%). On the opposite side, the lowest number of respondents foresee the establishment of spin-offs or start-up companies (4.4%) and licence practices (10.1%). As much as 9.6% of the respondents do not foresee such activities while 16.3% do not know or the question is not applicable.

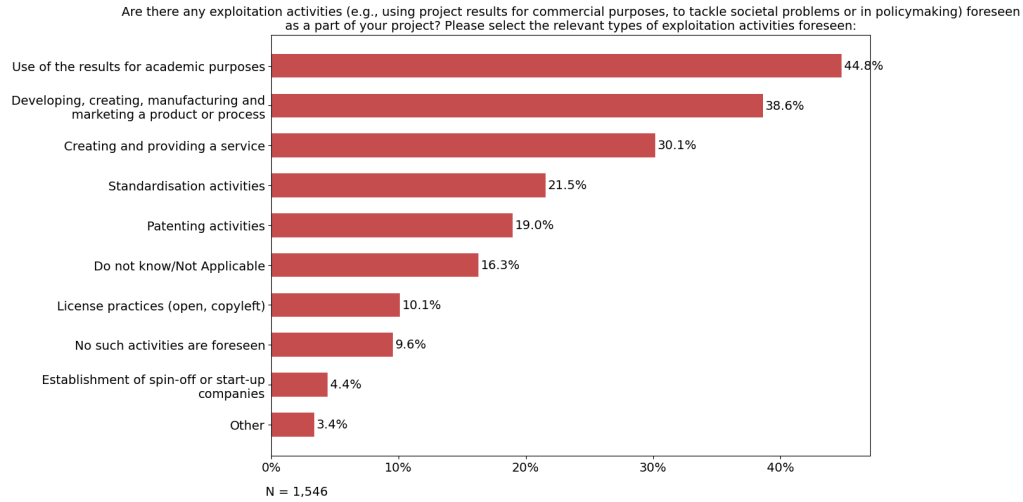

Figure 40 Q42: Are there any exploitation activities foreseen as a part of your project? Please select the relevant types of exploitation activities foreseen: (Cluster 5 in total)

8.3.3.6. EU added value

The following shows a comparison between HE funding and the research funding available to projects on national and/or regional level. Three quarters of 2Zero respondents (75%) agree to a large and very large extent that compared to the research funding available on national and regional level, HE funding involves a higher level of competition. Conversely, 64% of respondents believe that HE funding provides a higher amount of funding than

national/regional schemes. Moreover, 71% of respondents believe HE funding provides more opportunities for international mobility. A consistently high share of respondents agree to a large and very large extent that HE funding brings additional benefits. Only 11% of respondents believe there are no additional benefits to be gained from HE funding compared to national/regional funding.

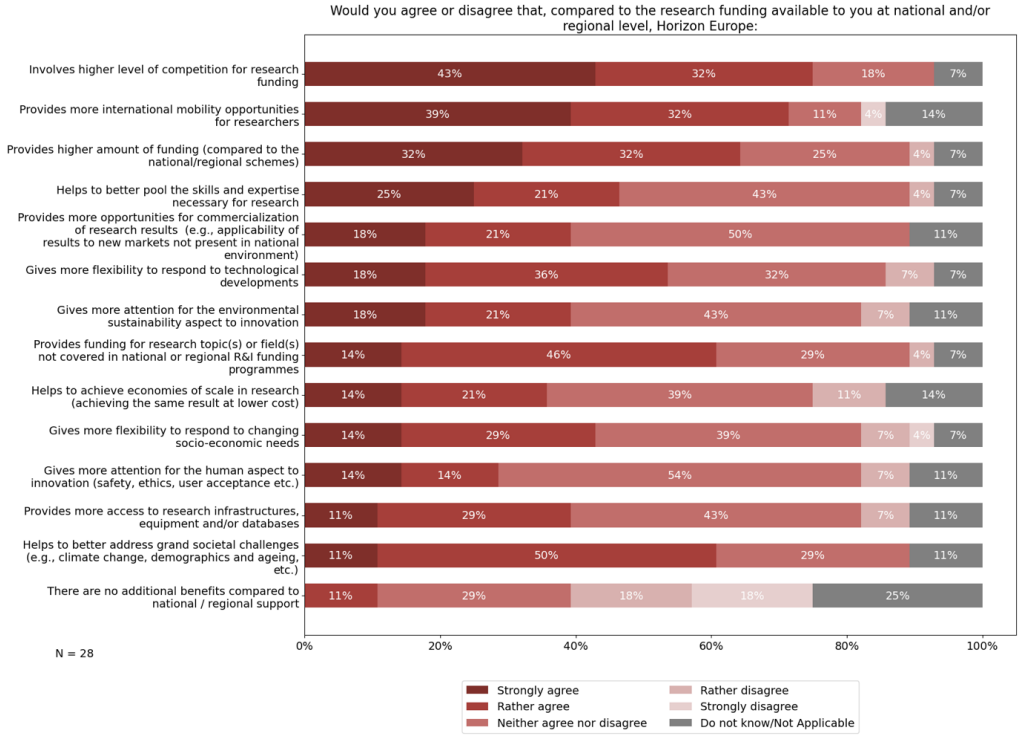

Figure 41: Would you agree or disagree that, compared to the research funding available to you at national and/or regional level, Horizon Europe: (2Zero)

Cluster 5: The highest number of respondents (78% agree to a large or very large extent) think the HE funding involved a higher level of competition for research funding. It is followed by the opinion that HE provides more international opportunities for mobility for researchers (76%). These two are followed by four statements supported by more than 60% of the respondents: HE provides higher amounts of funding (69%); HE helps to better pool skills and expertise necessary for research (66%); HE helps to better address grand societal challenges (66%); HE provides more access to research infrastructures (60%). As little as 13% of the respondents consider that HE does not have additional benefits compared to national/regional funding.

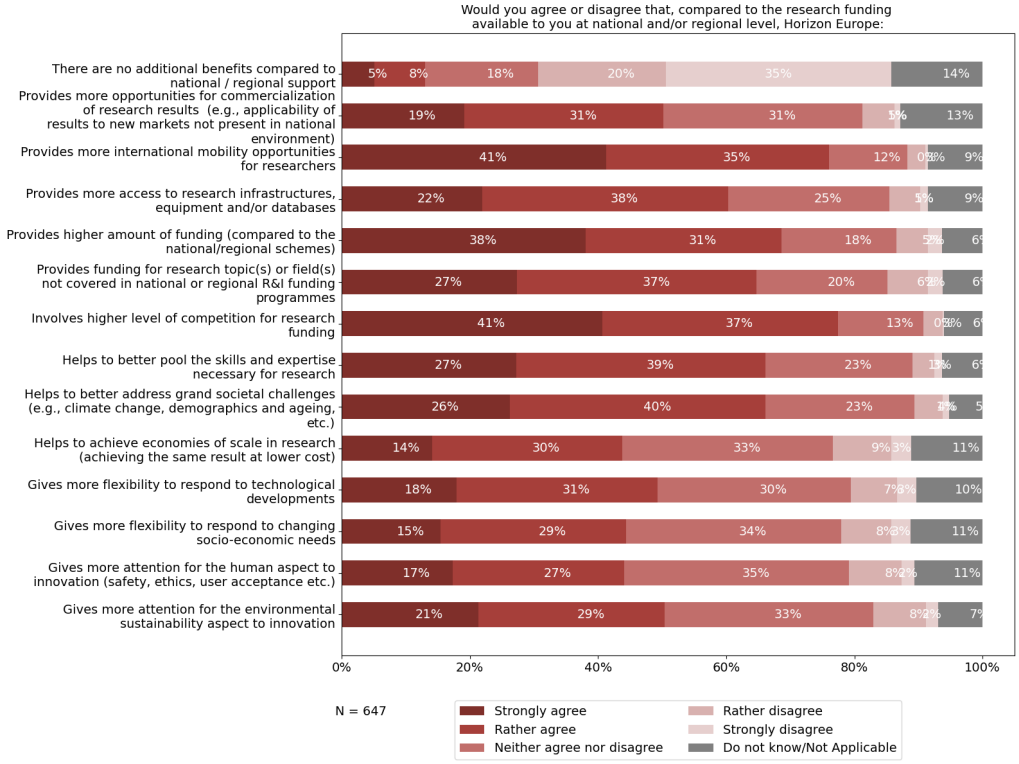

Figure 42: Q48 Would you agree or disagree that, compared to the research funding available to you on national and/or regional level, HE: (Cluster 5 in total)

8.3.4. Leverage factor

The direct leverage in this report represents the additional funds from third parties, public or private that have been mobilised by the EU project budget funds.

Table 7: Horizon Europe: Leverage factor of partnership projects

Partnership	org_type_groups	Total Eligible Cost (EUR milion)				Funding Rate (EU Contr/Total Cost)				Direct Leverage Factor* (1/Funding_Rate)-1			
		All action types	CSA	IA	RIA	All action types	CSA	IA	RIA	All action types	CSA	IA	RIA
2ZERO	any org type	231.3	3.8	131.2	96.4	0.817	0.973	0.701	0.968	0.224	0.027	0.426	0.033
	PRC only	153.0	1.4	96.2	55.4	0.725	0.971	0.592	0.948	0.380	0.030	0.689	0.054
Batt4EU	any org type	298.7	10.0	31.4	257.3	0.958	0.978	0.744	0.983	0.044	0.023	0.343	0.017
	PRC only	127.8	3.0	17.9	106.8	0.921	0.972	0.583	0.977	0.086	0.028	0.716	0.024
Built4People	any org type	57.3	1.2	56.1	0.0	0.757	0.854	0.755	N/A	0.321	0.171	0.325	N/A
	PRC only	31.3	0.3	31.0	0.0	0.588	1.000	0.583	N/A	0.701	0.000	0.714	N/A
CBE	any org type	148.4	2.9	98.6	47.0	0.783	1.000	0.698	0.949	0.277	0.000	0.433	0.053
	PRC only	89.6	1.4	68.5	19.7	0.658	1.000	0.582	0.899	0.520	0.000	0.719	0.113
CCAM	any org type	184.1	0.0	118.7	65.4	0.819	N/A	0.733	0.976	0.220	N/A	0.364	0.025
	PRC only	92.0	0.0	64.1	27.8	0.688	N/A	0.577	0.943	0.454	N/A	0.734	0.060
CLEAN-AVIATION	any org type	901.4	0.7	900.7	0.0	0.725	1.000	0.725	N/A	0.378	0.000	0.379	N/A
	PRC only	734.1	0.2	733.9	0.0	0.663	1.000	0.663	N/A	0.507	0.000	0.507	N/A
CLEANH2	any org type	423.2	2.1	270.8	150.4	0.641	0.993	0.469	0.945	0.561	0.007	1.133	0.058
	PRC only	334.3	0.4	250.5	83.4	0.548	1.000	0.427	0.908	0.825	0.000	1.340	0.101
ER (Shift2Rail successor)	any org type	315.9	0.0	315.9	0.0	0.736	N/A	0.736	N/A	0.359	N/A	0.359	N/A
	PRC only	278.1	0.0	278.1	0.0	0.700	N/A	0.700	N/A	0.429	N/A	0.429	N/A
SESAR 3	any org type	29.1	3.8	6.6	18.7	0.785	0.880	0.576	0.840	0.274	0.136	0.737	0.191
	PRC only	12.4	2.4	3.6	6.4	0.866	1.000	0.688	0.916	0.155	0.000	0.454	0.092
ZEWT	any org type	222.2	0.5	129.9	91.8	0.757	1.000	0.599	0.979	0.321	0.000	0.668	0.021
	PRC only	173.7	0.1	107.2	66.4	0.690	1.000	0.515	0.973	0.449	0.000	0.944	0.027

Source: CORDA (version from June/2023), except data on ER (Shift2Rail successor) which was obtained from the Horizon Dashboard (this data was incomplete on CORDA)
NOTES:
Data on EU contribution and Total Eligible Cost was extrated from CORDA (table participants)
Direct Leverage (not displayed) corresponds to the difference between Total Eligible Costs and EU Contributions
Funding Rate is the share of EU contributions on the Total Eligible Cost
Direct Leverage Factor corresponds to (Direct Leverage)/(EU Contribution)

Source: CORDA

In person
All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online (european-union.europa.eu/contact-eu/meet-us_en).

On the phone or in writing
Europe Direct is a service that answers your questions about the European Union.
You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: european-union.europa.eu/contact-eu/write-us_en.

Online
Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications
You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents
For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

EU open data
The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

This evaluation report is part of the interim evaluation of Horizon Europe activities related to the Green Transition. It presents the assessment of the Co-programmed European Partnership "Towards zero emission road transport" (2Zero) against the evaluation criteria of relevance, coherence, efficiency, effectiveness, EU added value, additionality, directionality, international positioning and visibility, transparency and openness as well as phasing out preparedness. The evaluation of the partnership is based upon a mixed-method approach including quantitative and qualitative data analysis.

Studies and reports

Publications Office
of the European Union