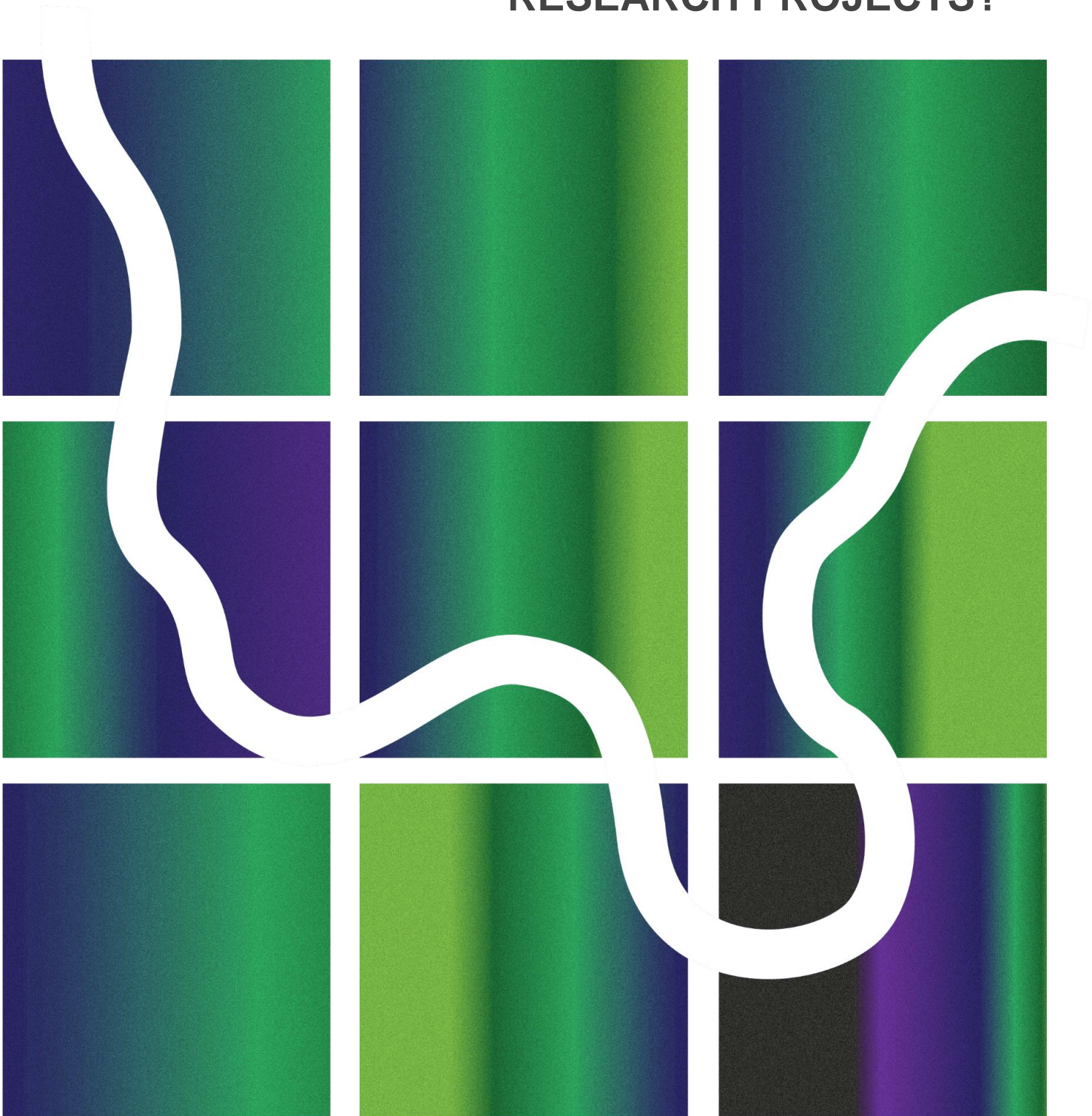


PRACTICAL GUIDE

HOW TO APPROACH THE IMPACT OF YOUR RESEARCH PROJECTS?



*“Heraclitus, I believe, says that all things pass and nothing stays,
and comparing existing things to the flow of a river,
he says you could not step twice into the same river.” – Plato*

Presentation of Eoh-for-Good

In a constantly changing world, it is crucial to adapt and adopt a collective constructive and resilience mindset able to find collaborative opportunities in difficult institutional or ecosystem setbacks.

The challenges brought by climate change, digitalisation and health affairs, in addition to traditional social issues such as violence of all kinds; hate and harassment; education inequalities, etc. and recent war contexts, have added urgency to the changes we need to undergo in the coming years.

Eoh-for-Good is an independent strategy consultancy specialised in generating transformational co-creation dynamics in organisations and regional innovation ecosystems. We dreamed of being able to offer management alternatives that would make us move forward with the new times, with the new realities. We dreamed of a more fluid management that took advantage of all the synergies, in constant dialogue with the different parties involved, listening to all opinions and learning to manage collective interests versus individuals, in search of win-wins and a common good.

Eoh-for-Good was born from the experience gained over more than 20 years in managing the R&I internationalisation, outreach, engagement and impact strategy of a first-rate educational institution and in collaboration with over 1300 stakeholders from an n-helix spectrum.

Eoh-for-Good has created the multi-i co-creative vortexes as a flexible and adaptable methodology to transform challenges into solutions through collaborative endeavours.

Eoh-for-Good can pursue processes of change with long-lasting positive impacts. How does it work? Ad-hoc in-house and in-context co-creative processes are designed and triggered by different elements that start with an ‘i’, hence its ‘multi-i’ collaborative nature: interpersonal, inter-institutional, interdisciplinary...

ad hoc combination of triple/quadruple/quintuple or n-helix actors identify a common challenge and by different types of institutions (universities, companies, SMEs, public bodies, social entities) and/or innovation ecosystems (regional, glocal).

About the author

Dr. Caro has held various positions and combined complementary roles as institutional innovator, Research & Innovation (R&I) strategist and manager, senior researcher, evaluation expert for the European Commission, entrepreneur... that endorse her expertise for writing this guide.

She is equipped to offer practical hints and tips to support applicants when preparing the impact section under criterion 2 for applications of Horizon Europe (HE) Call for Proposals (CfPs). The guide is based on the lessons learned during 23 years of dealing with international projects and almost a decade deepening on the impact dimension of R&I. Dr. Caro has participated in over 100 international-funded proposals since 1999 and personally led and/or actively contributed to the elaboration and implementation of several of them. She is expert evaluator for the European Commission (Horizon 2020, COSME Programme, Horizon Europe) and participates as an expert in several initiatives (ex. High Level Event Innovation Ecosystems or EUvsVirus Hackathon and Matchathon).

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www.eohforgood.com

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Abbreviations

BPA/GAP	Buenas Prácticas Agrícolas/Good Agricultural Practices
BP postdoc	Beatriu de Pinós postdoctoral programme fellows
CCRR	Comunidades de Regantes / Irrigation Communities
CfP	Call for Proposals
CEBAS-CSIC	Centro de Edafología y Biología Aplicada del Segura del Consejo Superior de Investigaciones Científicas (Center for Edaphology and Applied Biology of Segura of the Higher Council of Scientific Research)
CSA	Coordination and Support Action
DE&C	Dissemination, Exploitation and Communication Measures
DPH/HPD	Dominio Público Hidráulico/Hydraulic Public Domain
DNSH	Do No Significant Harm
EC	European Commission
ECOFIN	The Economic and Financial Affairs Council
EOs	Expected Outcomes
EIC	European Innovation Council
ERC	European Research Council
ESRS	European Sustainability Reporting Standards
EU	European Union
EI	Expected Impact
ERA	European Research Area
FP	Framework Programme
GDP	Gross Domestic Product
GRI	Global Reporting Initiative
HE	Horizon Europe
H2020	Horizon 2020
IA	Innovation Action
ICIO	Impuesto sobre Construcciones, Instalaciones y Obras/Tax on Constructions, Installations and Works
IDEA	The Institute for Diversification and Energy Saving
KPIs	Key Performance Indicators ¹
IRL	Innovation Readiness Levels
MSCA	Marie Skłodowska-Curie Actions
MITERD	The Spanish Ministry for Ecological Transition and the Demographic Challenge
MRR	Mecanismo de Recuperación y Resiliencia/Recovery and Resilience Mechanism
OCA/ACO	Organismos de Control Autorizados/Authorised Control Organisations
PDE	Partial Differential Equations
PPNs	Policies, Priorities and Needs
PRI	Partnerships for Regional Innovation
PRTR	Plan de Recuperación, Transformación y Resiliencia / Recovery, Transformation and Resilience Plan
RIA	Research and Innovation Action
RITE	Reglamento de Instalaciones Térmicas en los Edificios / Regulation of Thermal Installations in Buildings
R&I	Research and Innovation
SDGs	Sustainable Development Goals
SEIASA	Sociedad Estatal de Infraestructuras Agrarias / State Society of Agricultural Infrastructures
SoA	State of the Art
SRL	Societal Readiness Levels
STI	Science, Technology and Innovation
TPI	Transitions Performance Index
TRL	Technology Readiness Levels
UN	United Nations
UTAUT	Unified Theory of Acceptance and Use of Technology

¹ Note: KPI (Key Performance Indicators) should not be confused with Key Impact Indicators as explained in page 30 of the guide below

INTRODUCTION

The idea of this guide results from the perceived need of researchers, research support entities², and experts on the impact field of research and innovation (R&I), to join efforts to address in a more systematic way the growing relevance and complexity of the impact dimension of R&I.

Specifically, academics are increasingly expected to produce concrete and directly applicable solutions to hard-to-solve ‘real-world problems’ such as poverty, development, and environmental degradation³.

Thus, there is a broad range of research professionals that could be interested in a guide like this: This is primarily intended for BP postdoc⁴ researchers and research support staff to get valuable insights on the impact that explains the significance of their research work, through the Horizon Europe (HE) project methodology⁵. A first objective of this guide is to help understand and clarify the terminology used in Horizon Europe Call for Proposals (HE CfPs). It offers useful ideas for addressing the whole impact text of a HE application: how we do it, why we do it this way (there are many other valid ones⁶), we offer some ways and tips on what works for us, and most importantly what to do when we get stuck or do not know how or where to continue.

If you are reading this, it is most probably because you are faced with the same type of questions and challenges we have come across when working in challenge-driven collaborative projects... Let’s learn, exchange, and move forward together!

The guide is organised in three main sections: the first titled: ‘**Setting the scene - the whys**’: a) why we face so many difficulties to grasp the impact dimension of a competitive research and innovation proposal; b) why usually we do not know where and how to start, c) why there are no clearer guidelines or d) why it is so difficult to find standards.

The second one offers an **overview of the understanding of impact under the HE programme**. Focused on the HE impact criterion, this section introduces a broad presentation of HE and refers

² Such as AGAUR.

³ Henrike Rau, Gary Goggins, Frances Fahy, From invisibility to impact: Recognising the scientific and societal relevance of interdisciplinary sustainability research, Research Policy, Volume 47, Issue 1, 2018, ISSN 0048-7333

⁴ The ones recruited by Beatriu de Pinós Programme (BP Postdocs) in the first instance but open to the wider research community as part of the impact and exploitation plan of the programme. BP postdocs are research professionals with international experience who work on different disciplines to build knowledge and provide solutions for current and future social challenges.

⁵ Be aware that this guide does not cover the whole proposal preparation life cycle, therefore, less experienced researchers in grant preparation will need further background information from other sources, such as the section [How to participate](#) in the [Funding and Tenders Opportunities Portal](#).

⁶ There are many explored and unexplored ways to address the impact section and this guide adds to the rich existing body of knowledge on this topic. For a list of interesting resources, please see Annex 1 ‘Useful resources’.

to key resources to access information about the different pillars and instruments of the framework programme..

Finally, the third part, the longer one, deepens on the processes and the paths to impact. We have called it: '**Paving the way to impact - The Hows and the Whats**' to write an outstanding impact section, one that scores high in the evaluation phase of the HE CfP. This section addresses the question of what needs to be done, and how to fulfil the impact section step by step, based on the main questions included in a HE collaborative CfP under Pillar 2 or 3.

Pillar 1 is mainly focused on supporting basic research projects (frontier research projects) (ERC Grants); researchers' career development through the Marie Skłodowska Curie Actions (MSCA) and the development of research infrastructures. Therefore, the nature and treatment of impact under each of these instruments is envisaged ad hoc to respond to the needs and aims of the programme at hand. For example, ERC Grants are mainly centred on scientific impact, whereas MSCAs need to place impact around the career development of research staff (pre and post docs) in the context of their research question (bottom up) and the potential impact their research will produce for the contexts (local to global) and the target groups their research will tackle.

Beyond the practical approach of writing the impact section, what underlies this learning process is how to build long-term impact strategies, introducing the impact dimension in our R&I projects, from the idea inception all the way around throughout the project life cycle and beyond. How we can refine and improve from a discouraging evaluation to motivate re-submitting, based on the gained experience. This way we can start the whole cycle again by: a) identifying new challenges matching the CfPs priorities; b) outlining a comprehensive state of the art that identifies baseline indicators; c) defining ad hoc monitoring and assessment methodologies; etc.

Being a practical guide, approaches and tips are given to be applied to different HE pillars, instruments (Research and Innovation Action-RIA, Innovation Action-IA, Coordination and Support Action-CSA,...⁷), challenges, topics, etc. There is no room to tackle every sector or challenge, but researchers, entrepreneurs or innovators can use these practical exercises when preparing a competitive proposal in their own field

⁷ There are many other types of instruments: European Research Council-ERC Grants, European Innovation Council-EIC instruments; Marie Skłodowska-Curie Actions

The guide includes three examples in Annex 1 to clarify with three different types of projects, different in nature:

Project	Nature / Instrument	Level of implementation	Field/Challenge addressed
The first one is a H2020 ERC Advanced Grant that finished in September 2022 and prepared its impact report	Bottom-up ERC-Advanced Grant	Completed	Applied mathematics; Application of basic research to current challenges
The second one is a project that has addressed a process of standardisation for efficient energy supply and consumption in rural areas linked to the Next Generation Funds and the EU Green Deal Agenda	Top-down Innovation Action (IA)	Mid-way implementation phase	Energy sector; Sustainable renewable energy
The third one is a newly approved CSA under an EIC call addressing the EU innovation paradox, specifically how to integrate social innovation in innovation ecosystems	Top-down Coordination and Support Action (CSA)	Preliminary-starting phase	Social-digital driven innovation; Business-driven innovation; Regional Innovation Ecosystems; Healthy living and wellbeing

1. SETTING THE SCENE - THE WHYs FOR THIS GUIDE

The **FIRST REASON** for writing this guide is that **many complex challenges are placing impact at the fore and core of the agenda:**

1. **The imperative need to push forward the triple transition⁸** which aims to help humanity gather around a life-sustaining purpose, as opposed to life-destroying one in terms of: wars of all kinds (military, economic, political...); nature decay and wreckage (carbon footprint, plastic pollution, soil poisoning...); human alienation (favelas, homeless persons, refugee camps, child malnutrition, poverty, exclusion of any kind); geographic imbalances with empty rural spaces and overcrowded megacities (creating difficult access of rural and/or remote population to care, health and other essential services; difficulty of urban population to contact with natural environments); among others.

The European agenda is moving beyond the narrow focus on Gross Domestic Product (GDP) growth, with economic focus not seen as an objective but rather to an end for inclusive and sustainable development⁹.

2. **The need to reorient the production and consumption of energy and raw materials in the face of the harm we are imposing to our ecosystems and the accelerated climate change of recent years¹⁰.** The latest and upcoming geopolitical changes are, and surely will, boost socio-economic, environmental, political and scientific impacts in the form of:
 - More conscious behaviour - individual, social and corporate responsibility, as well as public procurement and regulations to secure a fairer use of resources and more sustainable habits (public transport, use of water,...)
 - Moving from conventional, extractive, and destructive, with negative impact, to green sustainable solutions (growing demand of energy, rare minerals and earth elements, etc.). One that is less destructive but still in need of going steps beyond to more restorative and long-term regenerative models. The ideation of new frameworks able to generate positive impacts will align efforts of social, environmental, and technological innovations to give back through learning from and with nature.

⁸ Caro-Gonzalez, A.; Serra, A.; Albala, X. (et al.) (2022), The Three MuskEuteers: Envisaging and pursuing a "One for all, All for one" triple transition: social, green and digital. In, Petrevska Nechkoska, R; Manceski G.; Poels, G.; *Facilitation in Complexity: From creation to co-creation, from dreaming to co-dreaming, from evolution to co-evolution*, Springer.

⁹ See the new Transitions Performance Index as a new dashboard developed by the European Commission 2022. Read it here: <https://lnkd.in/dhiNstRr>

¹⁰ According to a report by the University of Cambridge on the rationale of integrating climate and nature indicators for financial institutions: 'Climate change and nature loss are deeply interconnected. However, in the financial sector the risks and financial implications these poses are largely being tackled as independent issues.'

- The combination of science, innovation and alignment would allow to create life-friendly, regenerative, and resilient societies and ecosystems, with technology at the service of the social and environmental transition.

In this regard, the Transitions Performance Index (TPI) graph illustrates the contributions of each transition to the overall performance of a country over time, indicating strengths and weaknesses, room for progress, trade-offs, and synergies. It scores and ranks the EU27 Member States as well as 45 other countries, covering 76% of the world's population¹¹.






 TRANSITIONS PERFORMANCE INDEX			
 ECONOMIC TRANSITION Making the economy work for prosperity	 SOCIAL TRANSITION Focusing on fairness and inclusion	 ENVIRONMENTAL TRANSITION Supporting the European Green Deal objectives	 GOVERNANCE TRANSITION A new push for democracy
Education Government expenditure in education per student (% of GDP per capita) Internet users (%) Proportion of people with ICT skills (composite)	Health Healthy life expectancy at birth (years)	Emissions reduction Gross greenhouse gas emissions (tonnes per capita)	Fundamental rights Voice and accountability index Rule of law index
Wealth Gross domestic product (GDP) per capita, current dollars (PPPS)	Work and inclusion Employment rate of population 20-64 (%) Employment-to-population ratio gender gap 25+ (%) Gross enrolment ratio, pre-primary, both sexes (%)	Biodiversity Terrestrial key biodiversity areas (KBAs) protected (%) Freshwater KBAs protected (%) Pesticides use per area of cropland (kg/ha)	Security Homicide rate (per 100 000 inhabitants)
Labour productivity and R&D intensity Output per worker (2011 constant GDP PPPS) Gross expenditure on R&D (% of GDP)	Free or non-remunerated time Free or non-remunerated time (%)	Material use Resource productivity (PPPS per kg) Material footprint (tonnes per capita)	Transparency Corruption Perceptions Index Basel Anti-Money Laundering Index
Industrial base Gross value added of manufacturing (% of GDP) Patent families filed in two offices (per billion PPPS GDP)	Equality Gini coefficient of disposable income, after taxes and transfers Income share held by the poorest quintile (%)	Energy productivity Energy productivity (PPPS per koe)	Sound public finances General government gross debt (% of GDP)

Figure 1: Transitions Performance Index. Source: European Commission. Transition Performance Index 2021, in <https://ec.europa.eu/assets/rtd/tpi/2021/index.html>, accessed October 12, 2022

¹¹ Web: <https://cepr.org/voxeu/columns/fair-sustainable-and-prosperous-europe-needs-proper-navigation-tools>

3. **The precipitous drop-in birth rates in hundreds of countries around the world**¹² which is accelerating a worrying demographic crisis (with ageing population with no labour replacement to keep our production needs and welfare systems; and other regions, such as many African countries with the youngest population);
4. **The aim of Artificial Intelligence (AI) to blend human intellect and technology** to produce more intelligent¹³ systems not to replace humans but to help them, especially in boring tasks, with its many positive and unexpected impacts and consequences (ex. recent developments in the blockchain have paved the way to an increasingly secure form of smart contracts). However, blockchain is not only important in the context of smart contracts, but in ensuring Proof-of-Origin, Proof-of-Location, Proof-of-Authenticity, Proof-of-Review, Proof-of-Authorship. AI, especially ML, is evolving but still lacks a proper governance strategy to ensure responsibility and ethics. .
5. **Pandemics (as well as other extreme events) are a huge challenge** with growing importance where multiple disciplines must act in coordination. The COVID-19, and possible future pandemics to come, with their ongoing threat and pressure on our health, health systems and timely response to world sanitary crisis (ex. full vaccination of the world population), just to mention a few.

These, and many other hindering situations (ex. high dependency on fossil energy), are raising awareness on the need to make more decisive investments in R&I; and demanding the scientific world to provide more rapid informed, and scientifically contrasted, responses to the different local or global crises in so many fields.

The main question is how science, technology and innovation can timely deliver and generate positive long-lasting positive impacts. For this, the novel [European Council proposal on the knowledge valorisation](#) highlights the importance of extracting the value from knowledge and finding socioeconomic beneficial solutions for the society, thus, taking a holistic approach towards R&I. Co-creation between a variety of stakeholders, including social actors and citizens, creation of new jobs generated by emerging technologies, reskilling and upskilling, reciprocity of intellectual asset management are seen as an increasing need for international R&I collaboration. Paying special attention to this essential role of R&I is decisive:

- a) To promote further investment in R&I from public and private institutions;
- b) To raise awareness for entangling citizens, end users, professionals and policy makers

¹² An illustrative reflection on this issue can be found here:

<https://www.weforum.org/agenda/2022/06/global-decline-of-fertility-rates-visualised/#:~:text=For%20the%20last%2070%20years.increased%20cost%20of%20raising%20children>

¹³ I like to use the term 'wiser' for its connotation to 'having or showing experience, knowledge, and good judgement'. (Oxford English Dictionary), beyond the concept of smart, so in vogue in recent years.

with the generation of knowledge (ex. [Citizens science](#), [quadruple helix](#) co-creation mechanism, etc.); and

- c) To advocate for a continuous effort to open scientific and innovation results to society. This is linked with the R&I return on investment. Besides, open science is one of the main EC's policy priorities¹⁴.

The **SECOND REASON** is that usually **we do not know where and how to start when filling up the impact section of a research project proposal:**

1. **We have not done it before, or when we have tried, we have not been very successful**, therefore we do not feel confident to perform this task well.
2. **We have not been trained to think about or envision the impact that our actions, research, ideas and results will have in the short, medium or long term.** As academics, managers, policy makers, professionals in different sectors, we have been trained to perform well the main tasks of our roles: teaching, making research, innovation, social engagement, decision making, management, producing...). However, we have not been trained on how to deal with addressing impact, how to think on the positive or negative effect of our actions.

We lack the knowledge, the methodologies and the tools. Therefore, we need specific capacity building on this issue, to be upskilled or re-skilled within the course of our career development to incorporate a forward-looking vision on this issue.

3. **Moreover, our recognition systems are in transition.** We are facing tensions between the way R&I is recognised or rewarded (academic vs other types of impact-societal, political, environmental, economic; disciplinary vs inter or multidisciplinary approaches at individual, group or project levels); and different expectations for the results and impacts that R&I should bring about (for example the academic rigour vs rapid responses and informed decision making).

In recent decades, Higher Education institutions have been re-organising their resources and re-thinking their activities to generate dynamics to respond to new demands posed by a changing environment with rapidly evolving societal needs and Science, Technology and Innovation (STI) systems suffering a deep transformation.

On one hand, we need to deliver according to scientific standards¹⁵ and to our current quality recognition systems (number of scientific publications in highly ranked journals,

¹⁴ The eight objectives of the EU's open science policy can be encountered on the following [link](#).

¹⁵ Solid methodologies for in depth research based on quality data and results that demand a high amount of dedication, time, resources and risks.

patents, disciplinary panels...)¹⁶. However, on the other hand, funding agencies are moving to respond to complex challenges whose rhythms and needs are completely different from those in academia. We need to bridge the gap between science and policy priorities with more informed decision-making processes.

Therefore, delivering quality impactful research has become a labour of managing “a complex web of relationships, institutional cultures, and political agendas that require to open up the categories to see how they are conceived of by different actors” [1, p. 141] [Caro-Gonzales & Ferreira-Lopes \(2020\)](#)¹⁷. Companies, institutions, public bodies, universities and RTOs have to learn to navigate these new realities if they want to continue moving forward. We are developing governance and management models, collaborative and co-creating initiatives (quadruple helix co-creation dynamics)¹⁸ focused on defining shared agendas and producing win-win no-harming results in which everyone can contribute with their point of view.

4. We lack clear guidelines and standard indicators mainly due to a growing complexity:

4.1. There is a widening range of topics, themes or challenges to be addressed. This broad spectrum makes it not **feasible to offer a standardised battery of indicators to comprehensively cover all range of issues**. The report on assessing the analysis Horizon 2020 indicators¹⁹ states the lack of indicators’ reliability with regards to projects’ results and impact and stresses the variety of indicators depending on the discipline and sector. Universities and institutions face the similar problem (Molina-Molina et al., 2020)²⁰. We observe that several efforts have been made to set standardised indicators across sectors that show this complexity: a study carried out by Huovila et al. (2019)²¹ around standardisation of indicators in Smart sustainable cities; the research by Holzapfel, S.

¹⁶ In Spain, the Congress of Deputies has approved, with broad support and no votes against, the bill amending Law 14/2011, of June 1, on Science, Technology and Innovation.

¹⁷ We have experienced that under deeply threatening contexts (ex. COVID-19 lockdown), the activation of interpersonal, interdisciplinary, international, intergenerational and intercultural coordination (ex. EUvsVirus). happens spontaneously and/or in a coordinated and more institutionalised manner.

¹⁸ And the *Eoh-for-Good multi-i virtuous tornado*: a myriad of collaborations that start with an ‘i’ interpersonal, interdisciplinary, intersectoral, intergenerational, international... A good example is the EUvsVirus initiative that has been studied in two chapters of the book: [Renata Petrevska Nechkoska \(Editor\), Gjorgji Manceski \(Editor\), Geert Poels \(Eds\) \(2022\), Facilitation in Complexity: From Creation to Co-creation, from Dreaming to Co-dreaming, from Evolution to Co-evolution, Springer.](#)

¹⁹ [Horizon 2020 Indicators](#)

²⁰ These authors offer a more structured framework to approach this in the academic sector.

²¹ Huovila, A. Bosch, P. Airaksinen, M. (2019). Comparative analysis of standardized indicators for Smart sustainable cities: What indicators and standards to use and when? *Cities*, 89, 141-153. These are linked with ISO 37120 (and connected standards like ISO 37122, 37100 and 37101).

(2015)²² concerning standard indicators in development cooperation; or the [Guidance for standardising quantitative indicators of impact within REF case studies](#), to mention some examples.

For defining the needed KPIs in each project, my recommendation is to start by using, as much as possible, accepted approaches and already defined KPIs and frameworks. For example, the common framework of European Sustainability Reporting Standards (ESRS) will mark a major step in corporate sustainability reporting in the EU after the approval by the EU Council of the Corporate Sustainability Reporting Directive (CSRD). For detailed suggestions that concern the whole network of stakeholders, please refer to [the Council Recommendation on the guiding principles for knowledge valorisation](#).

The [EFQM Model](#) is an example of a wide and demanding organisational self-assessment framework that helps monitor the evolution of the vision, strategy and implementation of an entity activity and results. When used for preparing a European proposal, one needs to dig into the model to start defining KPIs as the results-impact part of the framework can support on defining the vision for impact in relation to the potential end user, for instance. However, there are many other models that you may be familiar with and/or are more ready to fit-for-purpose. To cover all the topics in your proposal, a targeted search for methodologies, indexes and indicators closely related to our field of research is required in every case. Please, keep in mind the growing importance of 'beyond GDP' indicators in policy making²³. You can use other existing examples; the following graph illustrates a customised set of indicators for resilient cities within the family of city indicators standards.

Complete Indicators for Resilient Cities



Figure 2: Complete Indicators for Resilience Cities. Source: DRAFT INTERNATIONAL STANDARD ISO/DIS 37123 (2019) Sustainable cities and communities — Indicators for resilient cities, ICS: 13.020.20, p. xii

²² Holzapfel, S. (2014). The Role of Indicators in Development Cooperation: An Overview Study with a Special Focus on the Use of Key and Standard Indicators. Available at SSRN: <https://ssrn.com/abstract=2546242> or <http://dx.doi.org/10.2139/ssrn.2546242>

²³ Dröll, Felke, Landabaso, Prevost, Terzi (2022), A fair, sustainable, and prosperous Europe needs proper navigation tools. In <https://cepr.org/voxeu/columns/fair-sustainable-and-prosperous-europe-needs-proper-navigation-tools>, accessed September 25, 2022.

Thus, there are various types of indicators depending on the different phases of the project's life cycle²⁴ (baseline-initial indicators, monitoring of progress, indicators of achievement, forward-looking indicators).

4.2. Different nature, objectives and targets of each of the three HE pillars with bottom-up or top-down approaches; basic science or close to the market applied results; focus on excellence or career development; challenge or innovation driven, etc.

4.3. Different levels of the technological, societal and innovation readiness levels, depending on the maturity of the research and innovation proposed (basic research, applied research, pilot). See [Annex 5: Project Maturity Level 'Technological/Societal/Innovation Readiness Levels'](#) for more information.

Furthermore, different stakeholders (public bodies, business world, academia, social organisations and citizens) have different expectations, rhythms and methodologies to reach positive impacts in their fields of interest. Therefore, we could conclude that although common understandings and basic guidelines are needed, it would be impossible to set a comprehensive overview of standardised impact indicators and pathways. Impact is contextual and should respond to the set priorities for the given field, period and geographical area(s) of application.

2. UNDERSTANDING THE IMPORTANCE OF IMPACT IN HORIZON EUROPE

The European Commission has been creating and implementing Funding Framework Programmes (FPs) as the main financial tools for research and innovation activities since 1984. A great variety of scientific disciplines and challenges has been covered by the FPs since its inception and keeps evolving and introducing new challenges in the priority setting. However, it has not been until the previous FP, Horizon 2020²⁵, when impact entered with stronger impetus into the debate. Since then, it has an imprint with major intensity in the HE biannual Work Programmes²⁶.

But, why is it so difficult to guide us within the impact 'jungle' and jargon?

²⁴ Project management life cycle: Initiation, Planning, Execution, Monitoring & Controlling, Closure, <https://www.educba.com/project-management-life-cycle/>

²⁵ FPs were renamed in 2014. H2020 should have been Framework Programme 8 (2014-2020) and Horizon Europe is Framework Programme 9 (2021-2027) with a budget of €95.5 billion.

²⁶ Beyond HE, the focus on impact is a more general trend as it is observed in other national frameworks. In Annex 4, 'Reference to Other National Impact Frameworks' a brief overview of how different entities and national systems define and understand impact is offered.

The social impact is not an absolute category, but it is what each of the actors' attributes to it. Agreed common frameworks, such as the [UN 2030 Agenda](#), [EU 2050 long-term strategy](#) or regional shared agendas²⁷ help set common understanding of the challenges ahead.

Social impact requires different angles of vision: a) From within (from the perspective of the agents involved in the proposed action, hence the importance of co-creation); and b) from outside, with a certain distance (not being too close or too involved in the problem) to be able to project combining scientific-technological advances and innovations, with economic, political and social visions and priorities in the medium-long term.

Policy decisions, prioritisation and alignment with agreed shared agendas are important landmarks for Horizon Europe (HE) impact planning. Science, innovation, decision making, uptake of outcomes and results and impact go hand in hand. R&I need to pay close attention to the given context and policy priorities with impact introduced in the research question from the very beginning. Decision making needs science to trigger decisive socio-economic, environmental and political transformations. Stakeholders from different sectors, helixes, backgrounds... must be included in the equation of R&I co-creation.

HE biannual Work Programmes are closely linked with the policy priorities as set by the EU legislation. Therefore, to address in practical terms the writing of the impact section of a HE CfP, we need to understand the dynamics of the top-down priority setting as reflected in the graph below elaborated by Sean and Sylvia McCarthy, where they have synthesised the impact pathways that underlie the European Union Policies and R&I framework programmes:

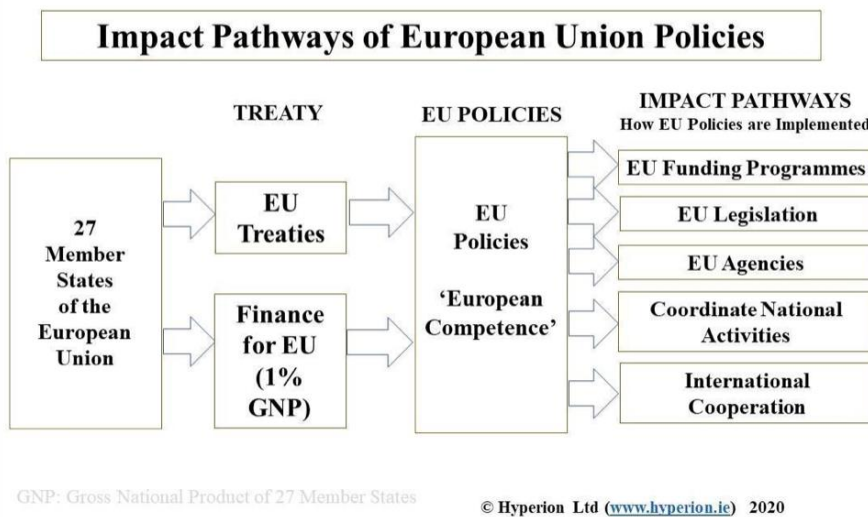


Figure 3: Impact Pathways of European Union Policies. Source: ©Sean McCarthy, Hyperion

²⁷ [Research and Innovation Strategy for the Smart Specialisation of Catalonia \(RIS3CAT\)](#) or the [Biscay 2050 plan](#)

This is the overall framework that rules the FPs and we need to understand how policies are intertwined with the EU funding programmes and how the EU policies are implemented into impact pathways. As can be observed, HE as the main EU R&I funding framework programme is closely related with the EU policies, EU Treaties and financial schemes, as set up by the EU Member States. This justifies that the expected outcomes and impacts reflected in the CfPs have a direct link with the wider related destinations, and we need to address and justify how the project will respond to ALL of them.

Together with the top-down vision,
 a bottom-up approach is needed in each proposal
 by suggesting innovative solutions
 with a logically interrelation from the project idea
 to the outcomes, deliverables, results, and wider impacts.

These should closely address the target groups and identified needs within the scope of the CfPs.

The following graph explains how the inclusion of impact has evolved in the two recent FPs (H2020 & HE) driven by a more real impact demanded based on the return on investment (budget for results) and the link with the UN global agenda and the targets of the Sustainable Development Goals

Goals under Pillar 2.

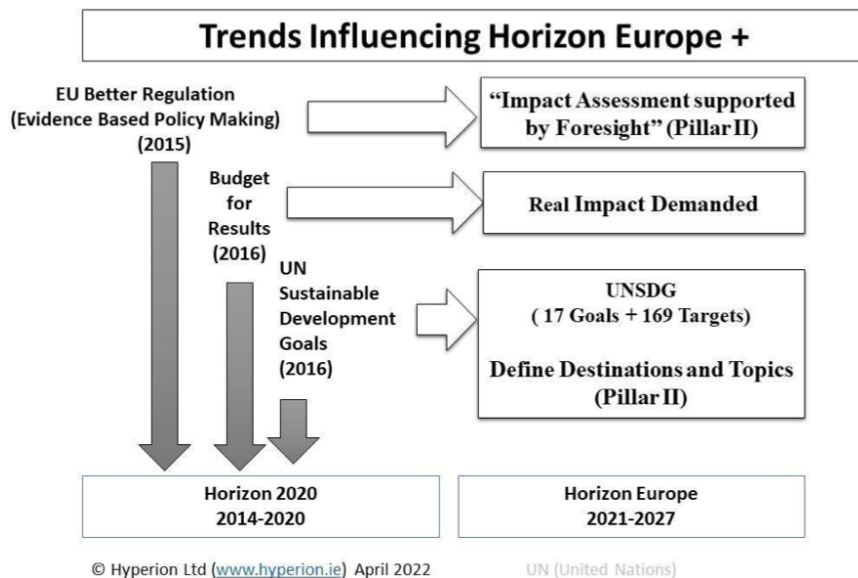


Figure 4: Trends Influencing Horizon Europe. Source: ©Sean McCarthy, Hyperion

To maximise impact and guarantee the successful uptake and exploitation of the results, HE strongly encourages approaching the market and the end

users while drafting a research and innovation proposal plan. HE fosters collaboration among different sectors, stresses the importance of the research impact in accordance with the EU policies and priorities while searching for answers for global challenges. Therefore, it is important to include different stakeholders and the end users in the proposal elaboration through co-creation activities where science, business, policy making and citizens do mix to resolve issues that really

matter and negotiate the win-win deals. When this co-creation process takes place and a brief explanation of this can be referred to in the proposal, this will be highly appreciated by the HE evaluators.

The underlying principle in HE CPs is that science and innovation should be able to respond to the complex challenges we are faced with as humanity, both at local or regional level (ex. rural-urban integration), or at global level (ex. climate change). The European Union has understood this urgency and need and has responded to it by introducing wider societal impacts (environmental, economic, political) in HE alongside scientific impact. HE is organised on **three main pillars** (Excellent Science, Global Challenges and European Industrial Competitiveness and an Innovative Europe) as the graph below demonstrates²⁸:



Figure 5: Horizon Europe Structure. Source: <https://www.horizon-eu.eu/>, accessed August 17, 2022.

Excellent Science: This pillar promotes scientific excellence, attracting highly skilled researchers and innovators to Europe. Focussing primarily on bottom-up research, where applicants can define their own research focus without pre-determined or directed grants calls, the pillar aims to support the development and diffusion to global social, environmental and economic challenges. Furthermore, it looks to encourage and facilitate the training and mobility of researchers as well as promote development of and access to world-class research infrastructures.

²⁸ For more information on the different pillars and instruments (Research and Innovation Action-RIA; Innovation Action-IA; Coordination and Support Action-CSA, etc.), please refer to the following links: [Horizon Europe Programme Guide](#), [How to participate](#).

Global Challenges: This pillar is to maximise impact, flexibility and synergies, research and innovation activities under Pillar 2. It is organised in six clusters, which individually and together will promote interdisciplinary²⁹, cross-sectorial, cross-policy, cross-border and international cooperation:

In relation to Pillar 2, top-down defined priorities for collaborative projects to address complex societal challenges, we find that the Commission supports and values positively research aimed at addressing the challenges identified in the CfP, in line with the global agenda and the sustainable development goals. These are arranged around 6 interdisciplinary clusters: Health, Culture, creativity, and an inclusive society, Security for the community, Digital, industry and space, Climate, energy, and mobility, Food, bioeconomy, natural resources, agriculture and environment as shown in the graph above.

European Industrial Competitiveness and Innovative Europe: This pillar will focus on scaling up breakthrough and market-creating innovation through a new European Innovation Council (EIC) as well as activities aimed at enhancing and developing the overall European innovation landscape. It will also include support to the European Institute of Innovation and Technology.

Every HE project should address a relevant social need or societal challenge.

But what does the European Commission understand by impact?

The European commission understands by impact the project's scientific, socio-economic, political and environmental benefits for the society. But, what does HE stress and strongly encourage?

- the need for a strong mission-oriented approach of the projects that tackle citizens' needs involving them into the co-design and co-creation processes that can generate innovative user-driven solutions;
- transnational, cross-border and cross-sector collaboration; and
- scientific findings to be reflected in products and services³⁰.

One of the main novelties regarding the impact section in the HE proposal in comparison with H2020 are the nine Key Impact Pathways related to three impact dimensions: scientific, societal, and economic/technological. In this sense, HE's impact driven strategy includes: impact design,

²⁹ Interdisciplinary work is increasingly necessary, from biology to demography, in dealing with global crises such as the COVID-19 and it is necessary to further improve European and global surveillance systems.

³⁰ Beyond increasing citation rates and indexing potential of academic staff.

implementation, impact tracking and evaluation (For more information, please see: [Paving the pathways to impact in Horizon Europe](#)).

The following graph shows the relationship between the three types of impact (scientific, societal and economic/technological) with its Key Impact Pathways defined by the HE Legislation:

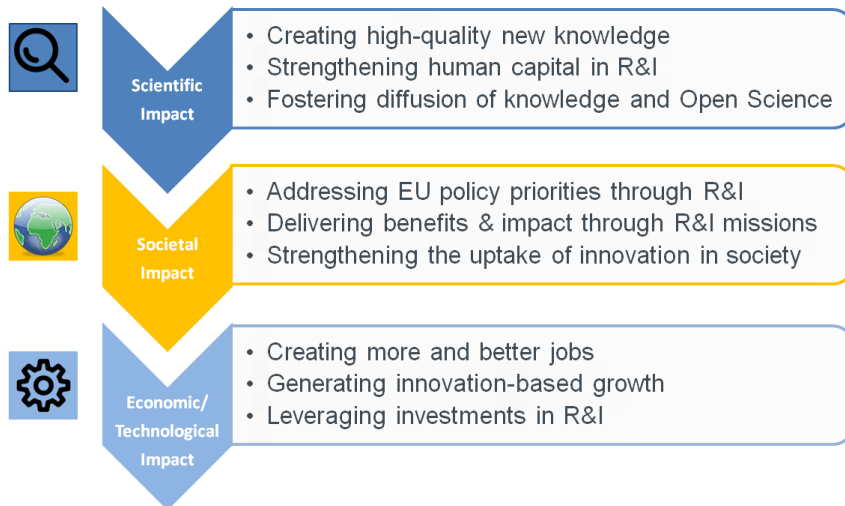


Figure 6: Key Impact Pathways. Source: Adapted from [Paving the pathways to impact in Horizon Europe projects](#) according to [Article 50 & Annex V](#), assessed on July 30, 2022

The impact is measured through short-, medium- and long-term goals which are closely linked to the dissemination and exploitation strategies of the project results. How are the co-creation, take up, scale up and exploitation strategies linked with the proposal idea and project development.

The following scheme represents the general overview of the HE framework with its main, specific and operational objectives linked to the three HE pillars. The broad lines of activities in the left side of the graphic are logically correlated with the operational and specific objectives in the central part of the image, as set out in the WPs of each of the 3 HE pillars. And finally, with the HE general objective placed on the right.

When writing a proposal, we should firstly define our initial project idea and reflect it in general and specific objectives. This will iteratively narrow down and focus our research question. We need to be sure that we are in scope and in full alignment with expected outcomes set up in the topic description. In the scheme above, we can also notice how the operational objectives are closely related with the previously mentioned key impact pathways. Alignment between broad lines of activities and HE General Objective (see figure in [A New Horizon For Europe - Impact Assessment, p. 1](#))

3. PAVING THE WAY TO IMPACT - THE HOWs and THE WHATs FOR A MORE IMPACTFUL PROJECT

To start with, we will take the impact section of a HE proposal to learn about How and What we need to fill in when preparing the projects' technical description. In HE, the impact section of a Standard Application Form (HE RIA, IA³¹, CSA) is usually composed of the following elements³². Further explanations of the table are subsequently detailed.

2. Impact

Impact – aspects to be taken into account.

- Credibility of the pathways to achieve the expected outcomes and impacts specified in the work programme, and the likely scale and significance of the contributions due to the project.

The results of your project should contribute to the expected outcomes set out for the WP topic over the medium term and to the wider expected impacts set out in the 'destination' over the longer term.
In this section you should know how your project could contribute to the outcomes and impacts described in the WP, the likely scale and significance of this contribution and the measures to maximise these impacts

2.1 Project's pathways towards impact [e.g. 3 pages]

- Provide a narrative explaining how the project's results are expected to make a difference in terms of impact, beyond the immediate scope and duration of the project. The narrative should include the components below, tailored to your project.
 - (a) Describe the unique contribution your project results would make towards (1) the outcomes specified in this topic, and (2) the wider impacts, in the longer term, specified in the respective destinations in the work programme.

³¹ Standard application Form, (HE RIA, IA stage 1) Project proposal – Technical description (Part B) Version 3.0 15 February 2022, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia-stage-1_en.pdf

³² The elements, wording and order included in this guide are an orientation that might suffer changes. It is mandatory to check specificities of each topic and instrument as some parts, requirements or wording might be different or slightly adjusted according to the CfP and given instrument. An example of a Standard Application Form (HE RIA and IA) can be found [here](#) and a more recent version [here](#), version 16th Feb 2022.

Be specific, referring to the effects of your project, and not R&I in general in this field. This can be done by including KPIs and measurable goals as projects sometimes miss quantification / measurability of effects.

State the target groups that would benefit. Even if target groups are mentioned in general terms in the work programme, you should be specific here, breaking target groups into particular interest groups or segments of society relevant to this project.

The outcomes and impacts of your project may be:

- Scientific, e.g., contributing to specific scientific advances, across and within disciplines, creating new knowledge, reinforcing scientific equipment and instruments, computing systems (i.e. research infrastructures);*
- Economic/technological, e.g., bringing new products, services, business processes to the market, increasing efficiency, decreasing costs, increasing profits, contributing to standards' setting, etc.*
- Societal, e.g., decreasing CO₂ emissions, decreasing avoidable mortality, improving policies and decision making, raising consumer awareness.*

Only include such outcomes and impacts where your project would make a significant and direct contribution. Avoid describing very tenuous links to wider impacts. However, include any potential negative environmental outcome or impact of the project including when expected results are brought at scale (such as at commercial level). Where relevant, explain how the potential harm can be managed.

- (b) Give an indication of the scale and significance of the project's contribution to the expected outcomes and impacts, should the project be successful. Provide quantified estimates where possible and meaningful.

'Scale' refers to how widespread the outcomes and impacts are likely to be. For example, in terms of the size of the target group, or the proportion of that group, that should benefit over time;

'Significance' refers to the importance, or value, of those benefits. For example, the number of additional healthy life years; efficiency savings in energy supply.

Explain your baselines, benchmarks and assumptions used for those estimates. Wherever possible, quantify your estimation of the effects that you expect from your project.

Explain assumptions that you make, referring for example to any relevant studies or statistics. Where appropriate, try to use only one methodology for calculating your estimates: not different methodologies for each partner, region or country (the extrapolation should preferably be prepared by one partner).

Your estimate must relate to this project only - the effect of other initiatives should not be taken into account.

- (c) *Describe any requirements and potential barriers - arising from factors beyond the scope and duration of the project - that may determine whether the desired outcomes and impacts are achieved. These may include, for example, other R&I work within and beyond Horizon Europe;*

Regulatory environment; targeted markets; user behaviour.
→ These barriers should have a linkage with the risk management part and, also, with the dissemination/exploitation plan and actions – for example, they may influence business models or stakeholders' engagement.

Indicate if these factors might evolve over time. Describe any mitigating measures you propose, within or beyond your project, that could be needed should your assumptions prove to be wrong, or to address identified barriers.

Note that this does not include the critical risks inherent to the management of the project itself, which should be described under 'Implementation'.

2.2. Measures to maximise impact - dissemination, exploitation and communication

Plan for the dissemination and exploitation including communication activities, dissemination and sustainability, including:

- A preliminary stakeholder mapping
- Dissemination, Exploitation and communication (DE&C) measures, activities and channels
- Management of intellectual property

Regarding exploitation, when possible, using a systematic and established approach helps a lot. Any kind of canvas (lean startup, BMC, social canvas) helps greatly to communicate key factors, key partners, channels... I always try to draft one for exploitation, which also supports justify communication and dissemination measures. It does not mean it is used in this section or even in the document (due to page limitations) but allows in the process to make more consistent linkages.

2.3 Summary - KEY ELEMENT OF THE IMPACT SECTION (Canvas)

Note: This composition of the impact section presented above refers mainly to CfP under Pillar 2 or 3. Different pillars and different instruments do present slightly different approaches and

headings adapted to the nature, scope and aim of each instrument. Please, read carefully and follow the instructions of the chosen topic to fill up the impact section.

2.3 Summary - KEY ELEMENT OF THE IMPACT SECTION

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
•	•	•

TARGET GROUPS	OUTCOMES	IMPACTS
•	•	•

This canvas has been envisaged to present a clear view of the main lines of the project (from objectives to impacts) in a thorough, but as simple manner as possible. This is of great value for the evaluation phase as evaluators need to grasp the project at first glance. A one-page summary is highly recommended.

The key question is how we can generate a positive impact with our HE proposal. How do we address the tasks of envisioning, planning, designing and finally writing the impact criterion in a proposal? And what do we need to do to perform well? Let's explain this step by step:

STEP 1: IDENTIFY THE APPROPRIATE CfP

In the first place, **we must identify the CfP** that aligns with our research idea. Search which funding opportunity could better support our research idea? Or we can identify a CfP that aligns with our research interest.

But how do we find these suitable CfP?

The most effective way to search for a grant is through the research support office at your institution or the programme National Contact Points (NCPs). They count with expertise and specialised knowledge and monitoring mechanisms to know the suitable open or future calls. Another reliable source is the European Commission [Funding and Tenders Opportunities](#), which is continuously updated. Through the "submission status" filter you can make a search by keywords. By doing so, you can focus on our area of expertise and filter the most suitable or aligned topics. In the case of knowing which specific programme you are aiming to address, you have the option to search with the Call reference or title.

A very useful resource is the network of [National Contact Points for HE](#). This is a body of experts at national level to provide guidance, practical information and assistance on all aspects of participation in HE. When possible, use the NCP to provide comments and suggestions before the publication of the work programme. Try to talk with the support staff involved in discussion groups for preparing some WP and try to contribute as early as possible. It is not guaranteed success, but it serves two purposes: influence the calls and be aware of the topics which allows to engage key relevant stakeholders in advance and have a foot in “strong” consortia.

STEP 2: CAREFULLY READ THE EXPECTED OUTCOMES OF THE CALL

Once you have **identified the suitable topic**, the first thing I advise you to do is to carefully read the expected outcomes of the call. The following is an example of a HE topic:

[HORIZON-EIE-2022-CONNECT-02-01 - Implementing co-funded action plans for interconnection of innovation ecosystems](#). With a brief text with bullet points format, the European Commission explains what it is expected in the Topic description of the CfP³³:

ExpectedOutcome:

Projects results are expected to contribute to all of the following expected outcomes:

- Open^[1], efficient inclusive and interconnected innovation ecosystems across Europe, building on their diversities and complementarities, enhancing the joint definition of visions and strategies with input from across the quadruple helix^[2], encouraging the alignment of their innovation agendas, and strengthening of their efficiency and potential to innovate;
- Enhanced synergies, complementarities and collaboration among all European innovation ecosystems' stakeholders around promising areas and challenges of joint and European interest, creation of common knowledge assets;
- Increased innovation capacities in Member States and Associated Countries, allowing innovators to bring their ideas into the market and enable innovations to be scaled up at EU level, and facilitating the link with the private sector and research and innovator actors;
- Better links between innovation leaders and strong innovators with moderate and modest innovators across the EU and Associated Countries;
- More innovation co-investments, fostering other funding leverages, including national or regional public funds and/or other private funds, to complement Horizon Europe support.

These statements reflect why the EC is opening this call. In sum, what is the scope and what it is expected from the proposals that the EC will receive. Applicants need to pay careful attention to fully understand what is behind those expected outcomes.

The project's results should be within the scope and fully aligned with the Commission's expectations as set in the CfP.

You need to build your proposal aligning the two sides of a coin. In the graph below, I have tried to explain it. On one hand, you need to align the right side of the image which emanates from

³³ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eie-2022-connect-02-01>, assessed January 12, 2022.

the CfP's analysis with the left-hand side which is the research on the State of the Art (SoA), the defined objectives, the outcomes and the results and impacts.

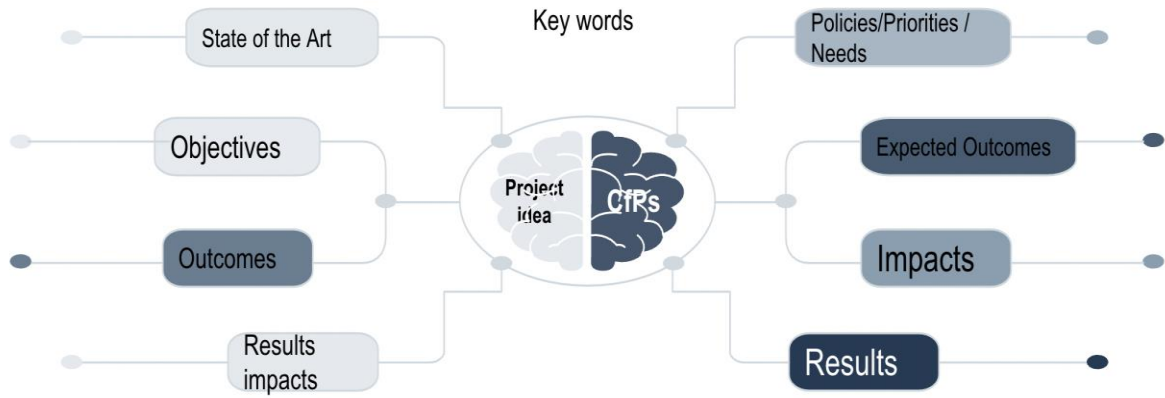


Figure 7: Link between CfP's and project's elements. Source: Self design

STEP 3 (S3): ANALYSE THE TOPIC DESCRIPTION

This must be done by reading it several times to fully grasp the main ideas behind it and make an identification of the keywords.

With those keywords, I propose four exercises to be crosscut in a later stage to align: the CfP, the project idea and the policy/priorities/needs with the information extracted from the SoA.

This is a key step to prepare a proposal within the scope of the CfP.

To carry out the topic description analysis you could complete the following four exercises:

S3-Exercise 1: analyse the expected outcomes.

To analyse the expected outcomes is useful to work with a table that helps us breakdown and synthesise the responses of the project to the EC expectations:

Expected outcome (EO)	How our project idea foresees to respond to the expected outcome
EO1-Open[1], efficient inclusive and interconnected innovation ecosystems across Europe, building on their diversities and complementarities, enhancing the joint definition of visions and strategies with input from across the quadruple helix[2], encouraging the alignment of their innovation agendas, and strengthening of their efficiency and potential to innovate	Explain in concrete terms how the project will address this EO
EO2-	

S3-Exercise 2: Understand what is behind the topic at the level of the policy priorities (Policies, Priorities and Needs-PPNs)

The objective is to understand the needs and priorities that have triggered this CfP: When we talk about political priorities, we must have a two-pronged approach also linked to the “destination”, as the expected contribution of the project to the expected impacts of the Work Program (WP) are described in the Destination, that the CfP are linked with. Special attention should be paid also to the cross-cutting priorities section" of the CfP.

First, you need to identify the keywords from the topic description. This will guide our search for the related policies. With the key words we will search for the most relevant EU policy documents that will justify the need that triggers the project and any other related policy documents that fits the nature of the project (thematically or geographically, ex. Local, regional or global agendas). Sometimes the call text or the WP identify some key documents. They should be analysed, too.

Keywords (extracted from the call)	Search for related policies
Innovation ecosystems	
Quadruple Helix	
Openness	
Collective interest	
Linking sectors	
Horizon Europe	
Local Scope	

S3-Exercise 3: Research on the state of the art (SoA)

The SoA exercise is composed of two main activities:

Exercise 3.1: To analyse and acknowledge what has been written so far in our area of research.

It is recommended to carry out a literature review³⁴ that helps us support the soundness of our project's background. For example, while searching for the references in the field, one of the practical pieces of advice in relation to impact would be to start with the identified key words in the topic description to narrow down the search. In relation to connecting the excellence and the impact section of the proposal is vital to identify the previous key results and baseline and target indicators that different authors offer, while going through the existing literature and data sets. Proposing key questions will touch upon the relevance, measurability and comprehensiveness of specific indicators. These results and indicators will be used as baseline or initial indicators to justify the need in the Excellence section and later in the impact section under 'scale and significance' (definitions of these two concepts can be found on page 24). This way we will obtain references of research that are focused on the impact as this will be reflected in the documents' title, abstract or main keywords.

³⁴ Following your usual methods for literature search (ex. choosing some of the websites specialised in academic literature such as Scopus, Dialnet, Web of Science, WorldWideScience, HighBeam Research, etc.). University online libraries give access to different academic databases that can be consulted. Moreover, each proposal can adopt different literature search, data analysis and synthesis techniques that could better fit its nature.

During the search, we can limit our quest results to the specific thematic subject area, geographical context, and limit the publication years (ex. Last 5 years) to obtain a first narrower list of results. After making a preview of the existing literature on the topic or carrying out the screening of the references, we can download them and classify them into thematic clouds (main key words). It is recommended to see these reflected in a table answering the questions of the project with their respective keywords and the link to the text. These searches will increase our bibliography and the background of the project.

Exercise 3.2: To search for the related previous Funded Projects

No funding body or agency wants to finance a project that has already been funded. Therefore, it is vital to justify and to prove a) the reason why our project is relevant; and b) its importance and significance to avoid repeating ideas that have been already funded in the past. The question to be answered is “What is the room of implementation that your project proposal will cover in relation to the identified gaps?” Therefore, this search needs to help focusing on the gaps and needs and it will offer a sound justification of what has been already achieved or found out not to have worked on so well.

One way to start with is by collecting data from the project partners: Which projects the consortium partners have or are participating in? If the project’s partners have already participated or are participating in similar projects demonstrate the consortium robustness and installed capacity in relation to the specific challenge to be tackled.

A second search is based on a highly recommended approach to access the repository of the related previously executed projects (ex. referring to CORDIS could help). This will provide a clear overview on what has been already done and achieved in the field. The key question is which are the rest of related projects they need to build upon. This should be synthesised in the proposal.

Be clear about the project's starting point, its strong and weak points, and where we want to go. Two issues must be raised:

- The first regards our project and its **context**:
 - how much progress has been made in this area,
 - what barriers are identified, and
 - how necessary is the need to invest and produce knowledge on the subject.
- The second question is where we want to go and what results we expect from the project.
 - We should be answering and proposing progress on the matter based on the first question.

This step is of the utmost importance because it will give us the **baseline indicators** that will be useful both for the researchers and stakeholders conforming the consortium and the evaluator panel of the proposal. For these baseline or initial indicators to be valid, it is convenient that bibliography and literature support them on previous contrasted results.

S3-Exercise 4: Crosscut the three previous searches: EOs, PPNs and SoA.

After having completed the three previous exercises, and before filling in the impact section, we are ready to cross-check and adjust the project idea.

It is recommended to write or represent in a table the alignment of our project idea with the previously identified literature, EC policies and priorities (destinations), and the expected outcomes of the topic we will address. The following table illustrates the above-mentioned idea:

HORIZON EUROPE IMPACT IMPLEMENTATION



Figure 8: Link between policy priority and project results. Source: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/experts/standard-briefing-slides-for-experts_he_en.pdf

One of the very important points to show in the proposal is the relationship between the project’s expected outcome (EO) and the expected impact (EI) as the above graphic shows. The medium-term outcome should respond to the EO which is related to the project’s topic. This usually happens during and shortly after the project. The expected outcome would then lead us to the project’s EI that is related to the destinations. This would give us a description of the project’s wider effect on the society that would happen at some point after the project’s end.

STEP 4 (S4): SETTING THE PROJECT INDICATORS

As explained above, the impact of a project can be measured with different scales and parameters depending on the area(s) and/or sector(s), as well as according to the maturity level of development of the project or innovation. Different types of indicators need to be taken into account when writing a proposal.

S4-Exercise 1: Define the baseline or initial indicators (where do we start from) and **final or target indicators** (where do we want to reach after the project ends)

As explained above, to complete the SoA search and analysis it is important to identify and refer to the initial or baseline indicators, and to justify the scale and the significance of our project (p. 24).

For Pillar 1, please refer to KPI across different working groups published by the ERC: <https://erc.europa.eu/thematic-working-groups/working-group-key-performance-indicators>

The MSCA³⁵ aim not only to have a positive impact on individual researchers, but also on the development of excellent doctoral programmes, postdoctoral training programmes and collaborative research projects. They have a structuring impact on higher education institutions and other entities beyond academia by widely spreading excellence and setting standards for high-quality researcher education and training, not only across the European Research Area (ERA), but also worldwide. Positive structuring effects on organisations include:

- increasing the quality of researchers' training and supervision offered;
- strengthening research capacity (e.g. ability to attract funding);
- improving human resources practices and procedures, and providing fairer and more attractive working conditions for researchers, including through career guidance and development;
- building new and sustainable international and inter-sectoral partnerships and networks;
- better transfer of knowledge between sectors and disciplines, enhancing their global reputation and visibility.

For Pillar 2, there are many examples that apply to the different topics under each of the six clusters. I include one reference around key performance indicators concerning consumer-centric electric markets by Oliveira et al. (2022) ³⁶.

For Pillar 3, please refer to the newly published guide by the EIC regarding key performance indicators: [Strategic Goals and Key Performance Indicators](#).

S4-Exercise 2: The topic related or thematically specific indicators

Depending on the project's nature, we need to refer to different sources, disciplines, methodologies, indexes to establish the indicators such as: innovation, poverty level, sustainable development targets, etc. Multi-, trans, Interdisciplinary approaches are more often present when

³⁵ Horizon Europe Work Programme 2021-2022, 2. Marie Skłodowska-Curie Actions, (European Commission Decision C(2021)4200 of 15 June 2021), pp. 6-7.

³⁶ Please check: <https://www.sciencedirect.com/science/article/abs/pii/S0378779622003121>

addressing complex challenges, therefore, composite indicators should be developed using existing sources and standards to adapt to the project characteristics and needs.

S4-Exercise 3: Key Impact Pathway Indicators

The impact section should reflect meaningful positive a) short term outcomes and results and b) medium and long term negotiated impacts. These should be related to

- a) The three types of impacts as set in HE (scientific, societal and economic/technological), and
- b) The time span (short, medium and long-term run), closely linked with monitoring progress³⁷.

S4-Exercise 4: Indicators related to the level of maturity of the solution proposed

Key Performance Indicators (KPIs) help us measure the level of efficiency toward our project's goals and objectives within the value chain of the chosen field. These should be coined with the joint effort of all stakeholders involved in the project. They are also related to the scale and the significance of our project (p. 24) and with the three types of readiness levels most used such as TRL, SRL and IRL. [Annex 5](#) presents graphic examples of these three types or readiness levels.

Please note that all four previous explained categories of indicators will require a combination of both quantitative and qualitative indicators. How these will be collected and monitored should be reflected in the project's methodology section. This way it is worth noting again the close interlinkage between the excellence and the impact section. In the methodology section under criterion 1 on excellence, the consortium should detail the methodology for monitoring progress and achievement of the proposed indicators.

After all the search and binding, here are some tips to fill in the different sub-headings.

2.1. Project's pathways towards impact

The impact pathways in a proposal relate to the 'logical steps towards the achievement of the expected impacts of the project over time, beyond the duration of a project.

Usually, the impact criterion can be positively evaluated if the impacts mentioned in the related work programme and in the specific topic are ALL well addressed.

As a proposer you need to demonstrate credibility to achieve the expected outcomes of the topic and the wider impacts in the longer term, as specified in the respective "destination" of the Work

³⁷ For further information, please, consult the following reference: [Horizon Europe Impact Assessment book](#) (pp. 146-148).

Programme where the calls for proposals are classified by subject areas. “The destinations are based on the EU’s policy priorities and the desired impact of the EU’s funding” (https://rea.ec.europa.eu/horizon-europe-how-apply_en).

Are the scale and significance of the project’s contribution to the expected outcomes and impacts estimated and quantified (including baselines and assumptions used for those estimates)?

2.1.1. Project contribution towards the outcomes specified in the topic description

2.1.2. Project wider impacts

As explained above, a crucial point to consider in our proposal is the scope that the Commission expects. Moreover, in terms of the impact, the durability of the project and how these results are maintained over time despite the end of the project's life, is going to be carefully evaluated. This means we should include clear goals in terms of results for measures/activities supported by verifiable indicators. We recommend consulting the Sustainable Development Goals, the EU taxonomy on sustainable finance or other relevant policy frameworks.

2.1.3. Scale and significance of the project’s desired outcomes and impacts

Contribution to wider impacts in the post-project implementation is closely linked with demonstrating sustainability after the project life span. This is one of the most triggering issues when dealing with impact. Usually, the first questions that come to our minds or discussions with our stakeholders are:

- How are we going to monitor and follow up what happens after the project ends? We will not have a budget or staff for doing so.
- Can we promise anything that we cannot be sure about its accountability?

2.1.4. Requirements, potential barriers and mitigation strategies

As usually noted in the text of the call, it should be clear what barriers we propose to overcome with our project, which need to be identified and duly justified in the proposal text.

Barriers does not refer to the critical risks inherent to the management of the project itself, as those should be described below under the “Implementation” section. They are related to obstacles that need to be tackled, which justify the change that the project aims to achieve.

They may arise from factors beyond the scope and duration of the project - that may determine whether the desired outcomes and impacts are achieved. These may include, for example, other R&I work within and beyond HE; regulatory environment; targeted markets; user behaviour. A clear explanation is required on how these barriers are going to be addressed with the project:

- indicating how these factors might evolve over time;
- describing any mitigating measures needed, within or beyond the project, to address the identified barriers or any hindrances that may arise should the project assumptions prove to be wrong.

This is linked also with the SoA search when we have had to identify the main barriers encountered by previous funded projects.

2.2. Measures to maximise impact - dissemination, exploitation and communication

Plan for the dissemination and exploitation including communication activities, dissemination and sustainability, including:

- A preliminary stakeholder mapping;
- Dissemination, exploitation and communication (DE&C) measures, activities and channels;
- Management of intellectual property.

EPILOGUE

This guide aims at facilitating practical tips to consider when dealing with the definition of a project's impact and a general framework on how to address it in HE projects. Thus, practical insights and exercises are enlisted that could help reflection and strategy when placing impact in our research projects in alignment with the expectations.

It raises awareness on how to introduce the impact dimension from the early stages, from the very idea inception throughout the project life cycle and beyond. The accountability and monitoring of impact once the project has ended is one of the triggering issues when dealing with impact.

I hope to have been able to bring closer the idea of the relevance that different stakeholders have in our research lines of action. I want to reinforce the importance of addressing and engaging the most relevant ones since the proposal preparation moment. This way besides complementarity, we will be also ensuring all of them feel owners of the process and share the vision. Of course, this may be theory if they are unreachable at this stage, but, when possible, a support letter and their contribution to define needs and barriers may help a lot.

Another relevant issue is the sensitivity the researchers should have towards political, social, economic, scientific, and environmental contexts that shape research questions and goals. There is a growing need for cooperation among different sectors (public, private, NGOs, etc) and geographical areas (local, regional, national, international) which stimulate us to go beyond the academic framework and comfort zone by embracing different and new methodologies, approaches and collaborations in search for the answers.

After setting the base of the guide in terms of the reasons why we need to learn about the impact approach, an overview of the HE framework is offered followed by the definition of impact by EC and other national frameworks, and the aspects that influence and shape it. I have focused on drawing attention to the interconnectedness between EC policies, priorities and HE Impact Pathways, on the one side, and our project's state of the art, objectives and different indicators, on the other. All of this should be adapted to each project's discipline and context when focusing on the project's impact in the short, medium and long-term run.

It approaches the main ideas of this in the section entitled "Impact section in a HE proposal" following the same requirements of the official HE proposal application in order to suggest and show more concretely how it could be filled out considering previous experience, exercises, interpretation and explanations of the HE impact aspect by different sources and experts and colleagues in the field.

What aspects must be considered?

- Practical issues: What is the form like: extension, format, one or two stages? What questions do we have to answer? What will the evaluation panel evaluate?
- Content topics: What policy priorities are related? What needs underlie the expected outcomes and what should we have searched for, analysed and determined in the state of the art?
- Monitoring methodologies and impact measurement aspects: What indicators, what data are we going to handle? Are there any existing indexes in relation to the topic?
- Special attention to target groups with the importance of co-creation mechanisms to integrate a diversity of knowledges, interests, points of views and potential win-win impacts.
- Importance of dissemination, communication and exploitation measures and plans (open access, Dissemination plan, citizen science)
- Aspects related to equity, diversity and gender.

The guide has a list of useful references (guides, toolkits, courses offered by various entities, impact case study base and some examples of these related to different topics).

The motivation for this guide is to acknowledge the main aspects involved that influence the projects' impact and improve researchers' awareness about the potential and benefits these could have for our society and environment. Let's not miss the opportunity to make our projects more inclusive, fair and sensible by taking a deeper reflection on How to make our academic knowledge and skills permeable for and receptive to different realities and local and global challenges and impacts.

FINAL RECOMMENDATIONS

Start as early as possible including the impact dimension in your research question and idea, as the best way to plan a successful proposal with long-term positive impact is by staying ahead. Understanding and mastering the project impact pathways takes time, so the best is to get the ball rolling as early as possible.

Keep an alert and agile, up to date, follow up of EU trends, policies, and programmes in your field: Bear in mind that you are not alone, support R&I offices, NCPs, experienced experts are the best allies for supporting you in capacity building and in adopting processes that allow for new requirements as they come along.

Do not assume that the 'impact wave' will not affect you: Robust impact approaches are becoming key for funding bodies, investors, policy makers, recognition schemes and society at large (ex. SROI), therefore it represents a vital opportunity for securing funding for R&I in the medium and long term.

Think big and in a systemic way: Beyond the boundaries of your project, field, consortium, project time frame... you are building within and upon a bigger tapestry (ex. SDGs) of intertwined evolving and expanding legislations, objectives, interests, requirements, and expectations. Do not tackle each element or dimension in isolation. Instead, lay strong foundations by implementing solid long-run processes (ex. Collaborative co-creative dynamics with different types of stakeholders).

Annex 1: THREE EXAMPLES OF IMPACTFUL PROJECTS

To make more tangible the content of this guide, I present below three different examples of projects co-designed in an interdisciplinary, intersectoral and multi-level policy alignment for generating long-term positive impacts.

The following are the key questions and scheme that guided the researchers and support staff while working in the elaboration of the proposals:

What are the specific needs that trigger this project?	Specific Needs
What do we expect to generate by the end of the project?	Expected Result / short- and long-term effects
Who will use or further up-take the results of the project?	Target Group
Who will benefit from the result of the project?	Outcomes
What change do we expect to see after successful dissemination and exploitation of project results to the target group(s)?	Impact
What are the expected wider scientific, economic and social effects of the project contributing to the expected impacts outlined in the respective destination in the work programme?	Impact
What dissemination, exploitation and communication measures will you apply to the result?	DEC Measures

The first example is an already completed H2020 project, funded by Pillar 1-Excellent Science - European Research Council (ERC), Advanced Grant and titled: DYCON-Dynamic Control and Numerics of Partial Differential Equations that has run between 2017-2022 and has just presented its impact report.

The second example is a process of standardisation developed by the INDES0 Group for the deployment of sustainable energy supply in rural areas in the South of Spain.

The third case is a HE-Coordination and Support Action (CSA) titled: INTEGER-INTERCONNECTING 4 HELIX INNOVATION ECOSYSTEMS IN EUROPEAN REGIONS³⁸ (2023-2025) of which I am coordinator from my role as senior researcher at the Digital Technology Society unit of the i2CAT Foundation.

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<https://www.linkedin.com/feed/hashtag/?keywords=integer&highlightedUpdateUrns=urn%3AIn%3Aactivity%3A6972570932674461696>

Acronym/Title: DYCON-Dynamic Control and Numerics of Partial Differential Equations^{39 40}

Funding mechanism: Horizon 2020 - European Research Council - Advanced Grant

Abstract (300 words max.)

This project aims at making a breakthrough contribution in the broad area of Control of Partial Differential Equations (PDE) and their numerical approximation methods by addressing key unsolved issues appearing systematically in real-life applications. To this end, we pursue three objectives: 1) to contribute with new key theoretical methods and results, 2) to develop the corresponding numerical tools, and 3) to build up new computational software, the DYCON-COMP computational platform, thereby bridging the gap to applications. The field of PDEs, together with numerical approximation and simulation methods and control theory, have evolved significantly in the last decades in a cross-fertilization process, to address the challenging demands of industrial and cross-disciplinary applications. Despite these efforts, some of the key issues remain unsolved, either because of a lack of analytical understanding, of the absence of efficient numerical solvers, or of a combination of both. This project identifies and focuses on six key topics that play a central role in most of the processes arising in applications, but which are still poorly understood: control of parameter dependent problems; long time horizon control; control under constraints; inverse design of time-irreversible models; memory models and hybrid PDE/ODE models, and finite versus infinite-dimensional dynamical systems. These topics cannot be handled by superposing the state of the art in the various disciplines, due to the unexpected interactive phenomena that may emerge, for instance, in the fine numerical approximation of control problems. The coordinated and focused effort that we aim at developing is timely and much needed in order to solve these issues and bridge the gap from modelling to control, computer simulations and applications.

Brief explanation of the need that triggered the project

DyCon's ambitious research programme has been developed at the intersection of three areas that have evolved rapidly in the last decades: i) Partial Differential Equations (PDE), ii) Control Theory and iii) Numerical Analysis.

This impact report has been designed following the Horizon Europe requisites and tools (ex.canvas). This report considers the different dimensions of impact during the project lifecycle, the resources and efforts invested, and the outcomes and impact generated by the project.

Alignment with local, national, EU and international policies and plans:

DyCon Project has based its research monitoring indicators on the following European references: European Research Area, Horizon Europe Framework Programme, Pillar 1-Excellence Science and ERC Working Programme 2015

The scope of the DyCon research programme during its lifetime has demonstrated to be aligned with regional and national research programmes such as

- a) The State Programme for R&D&I Oriented to the Challenges of Society (RETOS 2017) under the premises that each challenge constitutes an essential part of the scientific-technical and social priorities that must guide basic research activities of the agents of the Spanish System of Science, Technology and Innovation in the coming years.
- b) Regional funding programme to support the performance of Collaborative Research, carried out by the Research, Development and Innovation Entities integrated in the Basque Network of Science, Technology and Innovation of the Basque Country, in the areas of specialisation framed in the Plan for Science, Technology and Innovation Euskadi 202

³⁹ Prof. Dr. Enrique Zuazua, Chair for Dynamics, Control and Numerics / Alexander von Humboldt-Professorship - Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany and PI of the Dycon project

⁴⁰ Info retrieved and adapted with the PI's consent from: https://cmc.deusto.eus/wp-content/uploads/ERCDyCon_ImpactDimension_2016-2022.pdf,

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
<p>Scientific context. DyCon was envisaged to address research to understand and solve the control of partial differential equations (PDE) and Numerics through the definition of new theoretical methods and results, development of numerical tools and of a computational mathematical platform (DyCon Toolbox).</p> <p>Real-life applications. The theoretical and computational contributions of DyCon had an impact on different real-life applications such as medicine, water consumption and energy.</p> <p>Excellence researchers' involvement. Over the 6-year period, DyCon has challenged the participation and contribution of international researchers through specific placement programmes. The PI, in cooperation with all team members, has managed to build multi and interdisciplinary and intersectoral connections. These working relations have facilitated the overall team involvement and success, even while confronting the contingencies posed by the COVID pandemics.</p>	<p>Objective 1: One of the expected outcomes of the DyCon project was to consolidate a rich international network of collaborators, leading to analytical and computational results, implying a significant leverage in the state of the art of the important field of PDE control and its numerical and computational counterparts. The project has successfully developed a robust research network of collaborators at 2 different levels:</p> <ul style="list-style-type: none"> ● Level 1: The PI has not only consolidated a collaborative research network but has also facilitated research placements for researchers within several institutions with a total of 8 entities actively involved. ● Level 2: The PI has actively delivered research dissemination activities in 25 universities and research centres. <p>In addition, a total of 31 senior visitors have been involved in seminar events in the host Institution and 18 young researchers from European and non-European institutions have been involved in the development of DyCon working packages. The ERC-DyCon has also led to two non-European ERC Programmes as NSFC-ERC project (2019-2021) and NSF awardee from NSF Framework United States and Europe (2022)</p> <p>Objective 2. Over the project period, the DyCon team has actively been involved in two regional and national projects on the energy sector in alignment with the European research priorities:</p> <ul style="list-style-type: none"> ● Analysis and identification of critical parameters for the stability of hybrid AC/DC grids (COSNET National and ROAD2DC regional project) ● New technologies to increase power density in electronic converters CONVADP (regional project) ● Kinetic equations and Learning control- KiLearn (national project). <p>These other projects are aligned with the original goal of DyCon of addressing specific applications in sectors such as aviation aircrafts, water management or collective behaviour.</p>	<p>Dissemination (making sure that all results are freely available to the scientific community): A total of 101 papers have been published during the 72 months project period. The dissemination indicators can be summarised as follows: 62% cited in WoS and 74% in Scopus, 86% are covered by JCR quartiles (JCR Q1=57%, JCR Q2=26%, JCR Q3=10.3%, and 5.7% JCR Q4).</p> <p>Communication (increasing the public visibility of the project and its results using accessible language): the PI has actively been involved in different activities enhancing the public awareness on the relevance of mathematics, and its applications. These efforts are gathered in the dissemination webpage: https://cmc.deusto.eus/enzuazua/.</p> <p>Exploitation (Making concrete use of results). DyCon has developed specific outcomes on its 7 working packages. The development of the project has also led to new perspectives in the interface between Control Theory and Machine Learning. This has led to technological transfer agreements with the Basque Artificial Intelligence company Sherpa.ai for the period 2021-2023.</p> <p>DyCon has designed and developed several internal procedures and strategies to facilitate the visibility of the project's outcomes: a) The DyCon Computational Toolbox: A platform focused on the Matlab library for nonlinear optimal control problems, and b) The DyCon Blog. A web space to easily disseminate the research results (86 research entry blogs published).</p>

TARGET GROUPS	OUTCOMES	IMPACTS
<ul style="list-style-type: none"> • Mathematical research international community with special focus research teams in control theory. • Engineering and Computer • Science academic teams and research centers, to enhance the multidisciplinary knowledge and potential users of mathematical control research results. • Young researchers' communities, in an effort to contribute to the education of new mathematicians generations. • Public and private entities as potential users of the project results and outcomes, as well as ambassadors of the relevance of excellence research. • General public to enhance and convey the value of mathematics and its relevance in real-life issues. A particular effort was made on secondary school centres. 	<p>The ERC 2015 Work Programme aimed to a) lead to advances at the frontier of knowledge, b) set a clear and inspirational target for frontier research across Europe and c) maintain focus on excellence, encouraging initiative and combining simplicity and flexibility with accountability. The DyCon project has implemented novel methodologies to achieve high-quality scientific outcomes and train professionals in the field.</p> <p>The main outcomes could be summarised as follows:</p> <ul style="list-style-type: none"> - Consolidation of an international research network with 8 institutions through contract engagements, within the international community of mathematicians in the DyCon scientific areas. - Link between the international and regional innovation arenas through research projects developed in the Basque Region. Cooperation in the "Women for Africa National Programme", addressing the STEAM gap and the equal opportunities challenge. - Publication 101 scientific research papers and direct participation on energy application (hybrid AC/DC grids and electronic converters). - Registering of the DyCon Computational platform in the Basque Government general register of intellectual property (17/03/2021). - Development and consolidation of knowledge on emerging topics in the interface between control theory and machine learning. 	<ul style="list-style-type: none"> • Scientific impact. DyCon researchers have engaged careers in institutions such as Massachusetts Institute of Technology, Imperial College and Cambridge University, amongst others. • In addition, the project PI has been awarded an Alexander von Humboldt Professorship (2019) and the 2022 W.T. and Idalia Reid Prize of the SIAM, Society for Industrial and Applied Mathematics. • Knowledge transfer: Cooperation with Sherpa.ai. • DyCon has contributed to the successful interdisciplinary collaboration between universities and research centers through regional Basque projects on energy applications. • Societal: DyCon has pursued an active policy for gender equal opportunities through its public international calls for PhD students and postdocs. • The PI has received two societal awards such as the "Txopitea eta Pakea Award" of the Eibar Municipality (2020) and DEIA Top Talent Sariak (2021), Bilbao.

Acronym/Title: TAILOR-MADE STANDARDISATION PROCESS FOR IMPLEMENTATION OF POWER PLANTS IN RURAL AREAS FOR PRIMARY SECTOR^{41 42}

Funding mechanisms: Sustainable energy in rural areas, NextGeneration EU Funds: "Only those measures that respect the principle of not causing significant harm will be financed by the EU".

- Component No. 3 of the Spanish PRTR "Transformation and digitalization of the business sector and logistics chain of the agri-food and fisheries system" (1.46% of the Spanish PRTR): "Plan for the improvement of efficiency and sustainability in irrigation" (Investment C3.11), with an allocation under the MRR (Recovery and Resilience Mechanism) of 563 million € for investments in modernization of sustainable irrigation, with the aim of promoting water savings and improvement of energy efficiency and sustainability.
- June 2021-Dec 2024 - Work 4 months plus policy and regulation analysis and bureaucracy to obtain the tender for the implementation and start-up.

Abstract

The primary sector is highly exposed to market volatility and energy prices. What's more, the EU is not energetically self sufficient. To help farms, the EU has created policies to fund photovoltaic power plants to comply with the 2030 climate & energy framework, and to increase the profitability of the agricultural industry. In addition to this, "only those measures that respect the principle of not causing significant harm will be financed by the EU". Because of this, it is essential to write the photovoltaic project with the requirements of European policies. In this sense, this report tries to give you instructions to be successful in financing and executing the photovoltaic power plant.

The promoter of these renewable energy production facilities is SEIASA (State Society of Agricultural Infrastructures), an agency attached to the Ministry of Agriculture, Fisheries and Food, and the beneficiary is an Irrigation Community. These are three independent installations of photovoltaic production connected to the grid, without surplus. Each installation would be connected to a different pumping installation.

The anti-spill system of each installation would operate the photovoltaic plant as follows:

- If the demand of the pumping installation is higher than the production of the photovoltaic plant, the plant would not be affected.
- If the demand of the pumping installation is lower than the production of the photovoltaic plant, it is regulated to reduce its production and minimise the possible discharge to the grid.

The power of the three plants would be 575.26 kWp of photovoltaic field and 460 kW of the inverter power. The solar field would be placed on the ground, using 2V type metal structures driven into the ground.

Brief explanation of the need that triggered the project:

The agricultural and livestock sector is highly dependent on energy due to higher levels of industrialisation. After the COVID-19 health crisis, economic activity slowed down and is partly recovering, thanks to the Next Generation funds, among other measures. This led to demand outstripping supply. From mid 2021 onwards, there was a sharp increase in raw materials, including fossil fuels used in energy production (with gas trading almost 10 times higher). The price of electricity has increased four times in comparison with its regular price, this is so because the electricity market is often set and depends on generation technologies that use fossil fuels (such as combined cycle gas power plants).

Europe is not energy self-sufficient; it depends on other markets to import fossil fuels used in power generation. It is affected and influenced by fluctuations in the global market and by events of all kinds. Therefore, there is an urgent need to reform the energy market. While this reform is being carried out and materialised, it is necessary to implement measures more energetically sustainable and efficient, less dependent on countries outside the European Union, and at the same aim for a greater profitability and economic stability of the agricultural and livestock activity.

⁴¹The project's framework is the following: Document nº 1: Report and Appendices; Document nº 2: Plans; Document nº 3: Technical specifications; Document nº 4: Budget; Document nº 5: Security and Health study; Appendix: Description and valuation of the associated civil works (flattening of the earth, soil movement...); Additional plans: Soil movement and compaction: Land clearing and adequacy, plans with profiles. Annex: Excavation of footings (if applicable), drawings with details (additional elements); Roads, drawings with profiles; Backfilling and compaction, drawings with details and profiles; Construction stakeouts (Stakeout plans of all the constituent elements of the work, if applicable); drainage network; health and Safety Study; geotechnical study; waste management; archaeological study; expropriations and easements; environmental documentation; dismantling plan and restoration of initial conditions; general and economic specifications; floodability study; etc.

⁴² Thanks to Miguel Ángel Martínez, Manuel Lojo López. Bachelor of environmental sciences; César Javier Bello González and José María Martínez Romero, Industrial Engineers at INDESO Group for their generous commitment in summarising a complex project and process of standardisation.

If the primary sector is not energetically sufficient and is exposed to market volatility, there is a real risk that the energy crisis will lead to a food crisis caused by the closure of companies due to the negative profitability of their agricultural activity.

The EU's policy targets and objectives for the period 2021-2030, collected in the [2030 climate & energy framework](#), aim to at least 55% less greenhouse gas emissions compared to 1990 and at least 32% of renewables in energy consumption.

To respond to the previous situation, the Spanish Recovery, Transformation and Resilience Plan (in Spanish [PRTR](#)⁴³) designed and implemented several objectives for the PRTR evaluation (hereinafter CID). In this regard, objective number 48 of the Council Executing Decision set that at least 100,000 hectares of irrigated land should be modernised, at the latest by the second quarter of 2026 in terms of water saving and/or energy efficiency. This objective will be verified through the agreements between the State Society for Agricultural Infrastructure (Sociedad Estatal de Infraestructuras Agrarias - hereinafter [SEIASA](#)) and the concerned Irrigation Communities (hereinafter CCRR).

In response to this economic and environmental need, projects, such as this one, arose to reduce electricity dependence by implementing a renewable energy source (mainly photovoltaic), which replaced fossil sources needed for water pumping. These projects must meet certain requirements in order to fall under the PRTR and be financed by EU funds, as they must be approved by SEIASA. The evaluation of the PRTR must ensure that all the reforms and investments included in the PRTR comply with the *Do No Significant Harm* (hereinafter DNSH) principle. **SEIASA** will only support those measures that respect the "Do No Significant Harm" principle.

The photovoltaic installations are for self-consumption consisting of electricity self-generation. These installations can be isolated or connected to the Distribution Network. In turn, those connected to the Distribution Network can be without surpluses (they cannot discharge surpluses to the network, and they have an anti-spill device installed), or with surpluses (they can discharge surpluses to the network). Self-consumption installations with surpluses can be with compensation (≤ 100 kW), or with sale to the grid (without compensation)⁴⁴.

Alignment with local, national, EU and international policies and plans:

- Council Regulation (EU) 2020/2094 of 14 December 2020 establishing a European Union Recovery Facility to support recovery from the COVID-19 crisis.
- Regulation (EU) 2021/241 of 12 February 2021 establishing the Recovery and Resilience Mechanism (RRM).
- Recovery, Transformation and Resilience Plan (PRTR) for the Spanish economy, approved by Agreement of the Council of Ministers on April 27, 2021, and by the EU Council of Economic and Finance Ministers (ECOFIN) on July 13.
- Article 17 of Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020, on the June 2020 on establishing a framework to facilitate sustainable investments and amending Regulation (EU) 2019/2088: Investments must not cause significant harm to environmental objectives (DNSH principle).
- Article 5 of Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Mechanism: The assessment of Recovery and Resilience Plans should ensure that all reforms and investments covered by it, comply with the Do No Significant Harm (hereinafter DNSH) principle. The Facility will only support those measures that respect the principle of "Do No Significant Harm".
- Article 3 of Regulation 2020/852 of the European Parliament and of the Council of 18 June 2020, on establishing a framework to facilitate sustainable investments and amending Regulation (EU) 2019/2088, establishes the criteria applicable to environmentally sustainable economic activities, indicating in its paragraph b that "it does not cause any significant detriment to any of the environmental objectives set out in Article 9 in accordance with Article 17".
- Article 9 of Order HFP/1030/2021 of 29 September, which configures the PRTR management system: Information and publicity of the PRTR and the NextGenerationEU.
- Article 9 of Regulation 2020/852 of the European parliament and of the council of 18 June 2020 on establishing a framework to facilitate sustainable investments and amending Regulation (EU) 2019/2088. Environmental objectives are defined:
 - Climate change mitigation
 - Adaptation to climate change
 - Sustainable use and protection of water and marine resources.
 - Circular economy
 - Pollution prevention and control
 - Protection and restoration of biodiversity and ecosystems.

⁴³ https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility/spains-recovery-and-resilience-plan_en

⁴⁴ As specified in RD 244/2019.

Legalisation procedures

- Project and design; access and network connection permits
- Archaeological
- Hydrographic Confederation: Affection to DPH, flood areas
- Prior administrative authorization and execution
- Building permit and ICIO
- Environmental procedure (authorization/qualification)
- Final works certificate + OCA
- Authorisation of exploitation
- Periodic reviews by OCA

Consulted Sources

- Scientific-technical guidelines in application of the principle of "not causing significant damage to the environment" in the Plan for the Improvement of Efficiency and Sustainability in Irrigation: "implementation and maintenance of conservation plant structures" (hereinafter plant structures guideline) and "maintenance of measures to mitigate damage to fauna in irrigation ponds and associated infrastructures" (hereinafter fauna guideline). Carried out by the Centre for Edaphology and Applied Biology of Segura of the Higher Council of Scientific Research (CEBAS-CSIC).
- Guideline nº 5. Dissemination and training program on good agricultural practices (GAP) developed by the CSIC.
- Guide of the aspects to be considered in the drafting of projects framed in the investment C3.I1.
- Plan for the improvement of the efficiency and sustainability of irrigation, included in the recovery, transformation and resilience plan of the Government of Spain.
- Guide for the design and development of actions in accordance with the principle of not causing significant damage to the environment by MITERD (Spanish Ministry for Ecological Transition and the Demographic Challenge)
- IDEA's (The Institute for Diversification and Saving of Energy) professional guide for the processing of self-consumption.
- Recognized Document of the Regulation of Thermal Installations in Buildings (RITE): Co2 emission factors and coefficients of conversion to primary energy of different final energy sources consumed in the building sector in Spain.

Indicators (KPIs)

Based on previous prototypes and products this project has a high TRL, between TRL 8 and 9 as it is in a commercial phase ready for implementation in a real setting. The innovation of this project is the process of standardisation of a photovoltaic power plant according to the EU and national standards and regulations. This will potentially have an impact for further projects following the same installation paths.

- Expenditures for the improvement of the environment. Environmental monitoring plan for five years
- kWh/m³ water

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
<p>High energy prices. Dependence on foreign energy. Difficulty in accessing PPA contracts. Climate objectives, emissions reduction and energy efficiency (Horizon 2030).</p> <p>REQUIREMENTS</p> <ul style="list-style-type: none"> • Incorporate outreach measures and training in good agricultural practices. • Implementation of conservation plant structures and measures to mitigate damage to wildlife: • Planting of plant structures for pollinators. Maintenance for 3 years. • Nesting boxes for fauna (e.g. kestrel and bats). • Ponds for amphibians • Mechanised sowing of herbaceous plants. • Hunting fencing • Reuse of excavation soils • PV panel recycling association • Measures established by the Environmental Agency in the Environmental Resolution. • Low voltage (LV) photovoltaic installations⁴⁵ 	<ul style="list-style-type: none"> • Percentage of autarkic quota and percentage of self-consumption. • Reduction of CO2 emissions. • Increase in the percentage of energy from renewable sources. • The pumping facilities currently have an average annual demand of 825 MWh. The estimated production of the three photovoltaic plants would be 976 MWh; by having anti-disposal systems for this potential energy, about 488 MWh would be used, which represents savings of about 60%. In addition to the economic savings, which exceed €230,000 per year given current energy prices, it has a positive impact on the environment by reducing emissions of about 175 tons of CO2 per year. 	<ul style="list-style-type: none"> • Satisfaction and learning surveys on training in good agricultural practices. • Dissemination: Through websites, farmers' associations, irrigators' federations. • Measurement: Autarkic quota, self-consumption quota of the PV installation. • At the national level, % of renewable energies are in the mix.

TARGET GROUPS	OUTCOMES	IMPACTS
<p>– Irrigation Communities</p> <ul style="list-style-type: none"> • Cooperatives • Associations, irrigation federations 	<ul style="list-style-type: none"> • Results: knowledge acquired during the process of standardisation (analysis of all the variables and regulations ready for further implementation) • Scientific publications (in process of systematisation) • Further contracts with other end users • Training sessions interdisciplinary capacity building within the company 	<ul style="list-style-type: none"> • Economic: Energy and economic savings due to self-produced energy. • Social: Hectares of the Irrigation Community, in this case more than 40,000 hectares and 5,000 community members. • Environmental: Reduction of CO2 emissions

⁴⁵ The common regulation of obligatory compliance for almost all photovoltaic systems is Royal Decree 842/2002, of August 2, which approves the Low Voltage Electrotechnical Regulation (R.E.B.T.).

Acronym/Title: **INTERCONNECTING 4 HELIX INNOVATION ECOSYSTEMS IN EUROPEAN REGIONS (INTEGER)**⁴⁶

Funding mechanism: Topic: *HORIZON-EIE-2022-CONNECT-01-02 with a budget of 499.920€.*

Abstract:

Focused on challenge-driven promotion of healthy living, INTEGER will bring forward three important innovations for the development of more robust, sustainable, inclusive and integrative EU innovation ecosystems: 1.The INTEGER 4 Helix Collaboratory model to implement the next generation of living labs, the 'Collaboratories', 2.A EU Healthy Living Collaboratory, a true network of 'networks' community with capacity to work on real social, tech and business-driven projects, and 3. A new professional profile, the 'collaber' or 'collaboratory manager' as a multiplying agent of change of these integrated innovation ecosystems.

The 3 INTEGER reinforcing innovations will push fivefold breakthrough capacities for the integration of social innovation in EU innovation ecosystems:

- 1) Boost win-win games between business and social oriented innovations addressing common challenges.
- 2) Transform co-creation dynamics into disruptive and tangible new products, services or competencies.
- 3) Co-design jointly public innovation policies.
- 4) Develop capacity building of the new generation of socio-digital entrepreneurs and ecosystems' enablers, the collabers, and
- 5) Devise funding and investment mechanisms for social innovation start-ups and SMEs to develop and scale up game changing innovations.

Collaboratories and collabers aim to embrace economic and social-driven innovation communities across the EU. As novel 3H and 4H social-business innovation integration structures, these "labs without walls", are becoming the common open house of all kinds of innovators and entrepreneurs interested in producing new products and services that come from business or social oriented innovation. Based on a peer-to-peer approach between business-driven and social-driven innovations, INTEGER seeks to accelerate transformative integration outcomes by creating new win-win games, local mission-driven synergies, ground-breaking coordination of actions, governance, implementation, up-taking and exploitation dynamics

Brief explanation of the need that triggered the project:

For the literature search carried out to identify a state of the art, several aspects were crossed: desk bibliography, policies, previous projects, initiatives and networks. The search was done with the aim to build connections among all the layers (thematic and multi-level, from local to global and different policy interconnected areas). The gap was encountered between social innovators and entrepreneurs and their regional innovation ecosystems in the area of healthy living. A stronger human-centred approach regarding market-society was applied. The integrative quadruple helix model should help co-creation among actors, overcome mistrust, and implement and exploit minimum viable product or services (MPVS). These approaches should facilitate covering a need toward 4H EU co-creation communities and help access to funding opportunities and capacity building.

Alignment with local, national, EU and international policies and plans:

When preparing the project, we analysed the CfP, and the EU priorities such as digital, social innovation and artificial intelligence agendas were taken into account. These were crosscut with national, regional and international policies.

Destination: CONNECT (Networking) - Interconnected Innovation Ecosystems, which is to create more connected, inclusive and efficient innovation ecosystems that support the scaling of companies and spur innovation to address important challenges in a responsible way. The topic had a bottom-up approach. Complementarity: EIC, EIT, WIDERA WP, Digital Europe, EEN, RIS3...

On the EU level, INTEGER aligns with the Partnerships for Regional Innovation (PRI) boosted by the partnering between the Committee of the Regions (CoR) and the European Commission's Joint Research Centre (JRC), to build on positive experiences with smart specialisation strategies, testing tools to enhance the coordination and directionality of regional, national and EU innovation policies tackling the innovation divide in the EU. Moreover, the European Pillar on Social Rights and the European Regional Development Fund, Synthesis have been consulted to identify and report on previous EU projects and initiatives (https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/Overview%20on%20past%20projects%20and%20ongoing%20initiatives.pdf).

INTEGER will promote a more integrated use of EU policy instruments, mainly financed under the ERDF European Regional Development Funds and the ESF European Social Funds and the NextGenerationEU.

INTEGER will also refer to the WHO's health policy 5 strategic directions:

- Advancing governance and leadership;
- Leaving no one behind;

⁴⁶ Gratitude and appreciation to my project fellow organisations and partners for sharing this highly evaluated project in the impact section and proposed for funding by the EIC in July 2022.

- Addressing health determinants by promoting multi- and intersectoral policies;
- Establishing healthy places, settings and resilient communities;
- Strengthening health systems for universal health coverage

And 4 enabling measures:

- Investment for health;
- Multiparter cooperation;
- Health literacy, research and innovation; and
- Monitoring and evaluation, ([WHO/Europe](#)).

References used for indicators' setting:

- [European Innovation Scoreboard - Interactive Tool](#)
- [Gender Equality Index](#)
- [Global Innovation Index 2021](#)
- [H2020 Country Profile](#)
- [Regional Innovation Scoreboard](#)

2.3 Summary - KEY ELEMENT OF THE IMPACT SECTION⁴⁷

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
<ul style="list-style-type: none"> ● INTEGER will address the deep existing gap between social innovators and entrepreneurs and their regional innovation ecosystems to fully harness the potential of EU innovation in the critical policy area of healthy living and wellbeing ● A market-society pull approach needs to be developed based on a truly human-centred approach ● 	<ul style="list-style-type: none"> ● A new European Healthy Living collaboratory started through the good practices exchange and learning among three regional ecosystems acting as real integration testbeds <ul style="list-style-type: none"> - A fully working Healthy Living Colaboratory within the Catalonian regional ecosystem - Formal inclusion of 16 social innovators into the Hamburg regional ecosystem through networking, business modelling actions and financing gatherings - ... 	<ul style="list-style-type: none"> ● Dissemination measures to engage stakeholders: <ul style="list-style-type: none"> - 3 webinars to raise awareness; - 1 virtual consultation workshop; - Participation in 20 fairs/events - ... ● Exploitation roadmap to ensure the replication of INTEGER results... ● Communication tools to support dissemination...
TARGET GROUPS	OUTCOMES	IMPACTS
<ul style="list-style-type: none"> ● Social entrepreneurs ● Third sector ● Companies and businesses ● Incubators ● ... 	<ul style="list-style-type: none"> ● Consolidation of the participation of the social actors in 3 regional European Innovation Ecosystems ● Actual enhancement of the capacity building of the social entrepreneurs... 	<ul style="list-style-type: none"> ● Economical/technological: A working and workable 4H collaboratory model will enhance the European value model of economic competitiveness and social cohesion ● Societal: 4H stakeholders trained, informed and engaged...

⁴⁷ Brief extract from the proposal

Annex 2: DEFINITIONS

The [Horizon Europe Glossary](#)⁴⁸ offers definitions for the main keywords and concepts around its impact strategies, call for proposals and application process. The following lines highlight primarily the ones related to the impact:

EC POLICY PRIORITIES: Political Guidelines for the European Commission 2019-2024 (and other key strategic documents-e.g. Green Deal)

KEY STRATEGIC ORIENTATIONS FOR R&I: Set of strategic objectives within the EC policy priorities where R&I investments are expected to make a difference

IMPACT AREAS: Group of expected impacts highlighting the most important transformation to be fostered through R&I

EXPECTED IMPACTS (DESTINATIONS): Wider effects on society (incl. the environment), the economy and science enabled by the outcomes of R&I investments (long term).

-General objectives

EX: Strategic Plan & Work Programme R& contribution to seamless smart, inclusive and sustainable mobility services

Project: Increase maximum passenger capacity by 15% and passenger average throughout by 10% leading to a 25% reduction in infrastructure expansion costs

EXPECTED OUTCOMES (TOPICS): Effects of HE projects such as uptake, diffusion, use and deployment of the projects' results by direct target groups (medium term)

-Specific objectives

EX: Work Programme innovative accessibility and logistics solutions applied by the European Transport sector

Project: At least 9 European airports adopt the advanced forecasting system that was demonstrated during the project

PROJECT RESULTS (short term): Typically as of Year 1+ (what is achieved during the project execution and generated during the project implementation)

=Operational objectives: What is produced during the project implementation, such as innovative solutions, algorithms, new business models, guidelines, policy recommendations, methodologies, publications, databases, prototypes, trained researchers, new infrastructures, proof of feasibility, networks, direct or indirect employment generated, etc. (short term)

EX: Project /by the end of its implementation Successful large-scale demonstration trial with 3 airports of an advanced forecasting system for proactive airport passenger flow management.

OUTCOME (medium term): Typically as of Year 3+ (Shortly after project ends). Expected effects of the project. Please relate to the expected outcomes mentioned in the topic as well as the Key Strategic Orientations (KSOs) and outcomes mentioned in the destination.

PROJECT IMPACT: Typically as of Year 5+ (long-term goals). This represents a wider effect on the society, environment, economy and science, enabled by the outcome of the R&I investments.

⁴⁸ <https://www.eaic.eu/news/implementing-impact-in-horizon-europe-proposals>

Annex 3: USEFUL RESOURCES

Guides and toolkits

- [A New Horizon For Europe - Impact Assessment](#)
- [Guidance for standardising quantitative indicators of impact within REF case studies](#)
- [European Sustainability Reporting Standards \(ESRS\)](#)
- [Horizon Europe: How to optimise your impact section?](#)
- [Horizon Europe Proposal Evaluation](#)
- [Impact Pathways tool](#)
- [Maximising the impact section of Horizon Europe projects.](#)
- [Open Impact⁴⁹](#)
- [Paving the pathways to impact in Horizon Europe](#)
- [Research Excellence Framework Impact Toolkit](#)
- [¿Qué debo tener en cuenta a la hora de escribir la sección de impacto en mi propuesta de H2020?](#)

Training and courses

- [Collaborative projects in Horizon Europe - Complete Course](#)
- [Horizon Europe Courses - The Research Council of Norway](#)
- [Horizon Europe Training](#)
- [How to Write a Competitive Proposal for Pillar II \(Horizon Europe\)](#) Presented by Seán and Sylvia McCarthy Hyperion Ltd
- [Training on Horizon Europe proposal writing - Two parts - Available on You Tube](#)

Impact Case Studies

- [Impact Case Study Database](#)
- [Impact Case Study Example - Education](#)
- [Impact Case Study Example - Communication, Culture and Media studies](#)
- [Impact Case Study Example - Engineering](#)
- [Impact Case Study Example - Biological sciences](#)
- [Impact Case Study Example - Geography and Environmental Studies](#)

Useful links

- [Horizon Europe Glossary](#)
- [The European Commission's policies](#)
- [The European Commission's priorities](#)

Note: This is a non-exhaustive list

⁴⁹ Open Impact is an accredited spin-off of the University of Milano-Bicocca (Italy) that provides services and develops digital products for the measurement, enhancement and management of impacts in a perspective of integrated sustainability. It offers services to organisations and consortia using their Open Impact Platform, a dynamic environment that enables the development of customisable digital applications for a sound impact assessment/management of projects. The Open Impact Platform is powered by the Open Impact Database, the first database in Italy for impact benchmarking, which contains a huge amount of internationally validated open-source impact assessments data, organically collected and systematised. The Open Impact Database is designed to support organisations and consortia in identifying, tracking and communicating the social, economic and environmental impacts they generate, linking them to the 17 UN Sustainable Development Goals and other sustainability frameworks, such as GRI, SASB, ESG, and European Taxonomy.

Annex 4: REFERENCE TO OTHER IMPACT NATIONAL FRAMEWORKS

[The Australian Research Council's](#) Impact Principles and Framework defines the research impact as “the contribution that research makes to the economy, society, environment or culture, beyond the contribution to academic research”. The outline of its research impact pathway can be found [here](#).

[Dutch valorisation](#) is another way the impact or knowledge transfer is understood. Its definition has been shaped throughout the years. Nevertheless, the priorities it englobes are the importance of interaction between academia and the public, private and NGO sector, and the use of knowledge to solve societal issues.

The [Knowledge Exchange Framework-KEF](#) is a novel way of measuring the impact the Universities have on the society, communities, and businesses. It is created with the aim to help knowledge exchange among different stakeholders and help public funding to be more effective. It is measured through universities' collaboration with public, private and the third sector, community engagement, and intellectual property, among others.

[Research Excellence Framework-REF](#) describes it as the “effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia”. More than 6000 impact case studies were submitted to REF 2021. To access the impact case study database, follow the link: <https://results2021.ref.ac.uk/impact>. This database gathers a whole wealth of information on successful impact research including the geographical areas where the impact took place.

Annex 5: PROJECT MATURITY LEVEL: Technological, Innovation and Societal Readiness Levels

Technology Readiness Level (TRL) is a scale that was originally developed by NASA and was initially introduced in Horizon 2020 being now fully established in HE. The TRL scale is a method for understanding the technical maturity of a technology during its development and acquisition phase. It comprises nine technology readiness levels (TRL1 to TRL9). These levels indicate how far a technology is from being fully applied in its intended environment. For example, TRL2 to TRL4 indicate that the concept is being developed in the laboratory, TRL5 to TRL7 indicate that the technology is being validated or demonstrated in a relevant environment (piloting), while TRL8 and TRL9 imply that the technology is fully implemented, e.g. in a commercial environment. It represents a maturity scale to allow engineers to have a consistent datum of reference for understanding technology unfolding and evolution, and to pursue a better and more successful implementation of the project. More information on TRL in HE can be found on the following [link](#). The following graph shows an example of the European Space Agency:

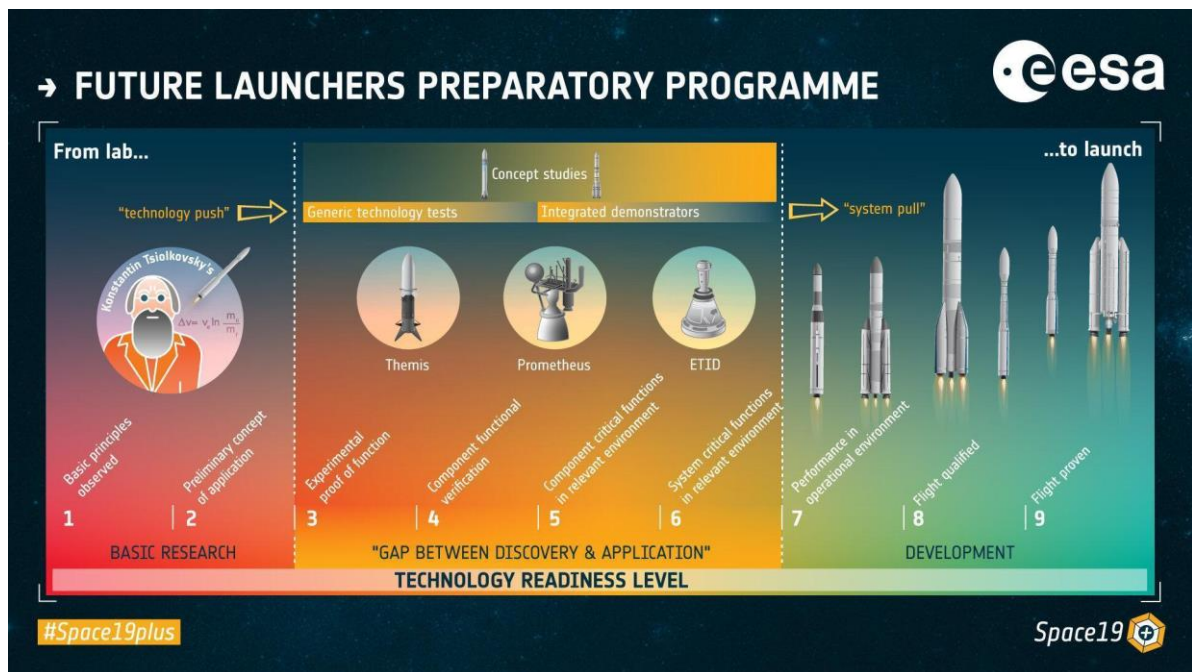


Figure 9: Technology Readiness Levels.

Source: https://www.esa.int/ESA_Multimedia/Images/2019/06/Technology_Readiness_Levels

Innovation Readiness Levels (IRL) shows the life cycle regarding the development of a given innovation. A proposed framework to analyse different stages and aspects of the IRL can be found in (Lan et al. 2010, 28)⁵⁰ who offered a framework based on the 6 “C” model (concept, components, completion, charm, competition and changeover) to assess innovation across five aspects: technology, market, organisation, partnership, and risk.

The following graphic shows the correspondence between TRLs and IRLs levels, with TRL levels representing the first 9 stages of a research or innovation in relation to their degree of advancement in the value chain from idea inception to the phase of becoming a changeover:

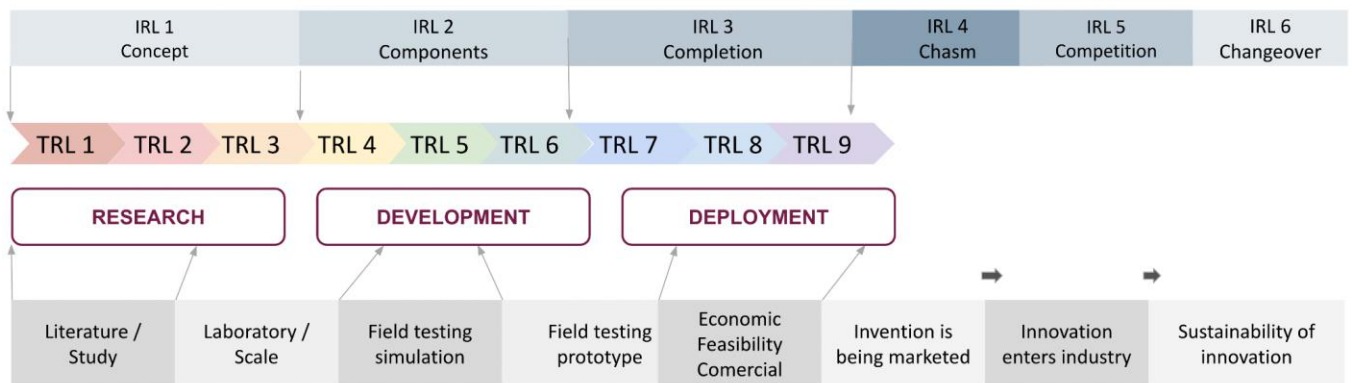


Figure 10: Integration of Technology Readiness Level and Innovation Readiness Level Source: Adapted from Setiawan, A., Sulaswatty, A., Meliana, Y., & Haryono, A. (2018). Innovation Readiness Assessment toward Research Commercialization: Case of Surfactants for Food Processing. International Journal of Innovation, 6(2), 180-193.

⁵⁰ Lan, T. Probert, D. & Phaal, R. (2010). Towards an integrated framework for managing the process of innovation. *R&D Management*, 40(1), 19-30.

Societal Readiness Levels (SRL), are a way of assessing the level of social adaptation, integration and/or uptake into society of, for example, a particular social project, a technology⁵¹, a product, a process, an intervention or an innovation (whether social or technical). For doing so, it is effective to know, envisage and describe the adaptive power of the project to:

- the specific context (local, regional, national, international) in which it will work,
- the scale of the project, whether it is large, medium or small, with pilots and demonstrators or applications to be proven; and
- the concrete target group/s it is oriented to. This has been concretely included under sub criterion 2 of HE proposals.

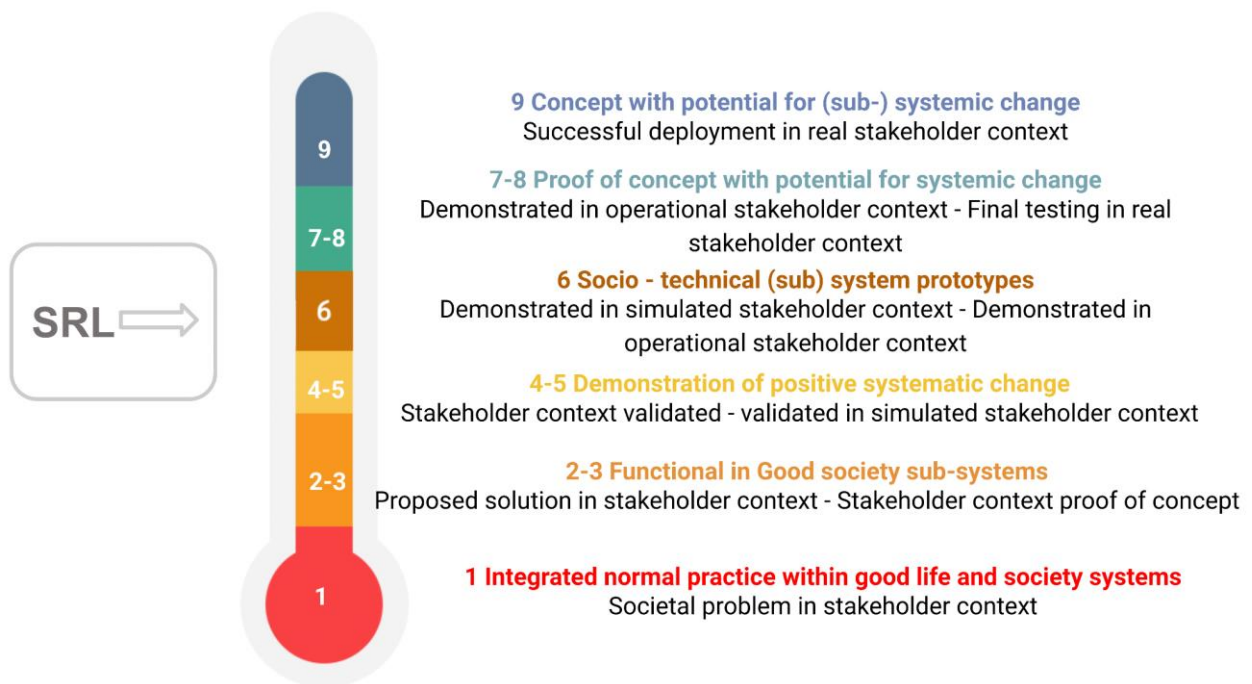


Figure 12: Societal Readiness Levels (SRL). Source: Adapted from: <https://www.slideshare.net/DecarboN8/cut-carbon-symposium-societal-readiness-level/>, accessed July 14, 2022.

⁵¹ Regarding technology, I would also mention the paramount need to assess and promote usage and acceptance. Usually, I follow the unified theory of acceptance and use of technology (UTAUT) approaches. Although closely linked with the implementation section, it is also linked with impact.



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Collaborating entity

