

**The European Social Innovation  
Diplomacy, a post-2020 strategy  
to put the EU at the global scene:  
*The role of Sweden as an  
innovative leader***



**– Master Final Thesis –**

**Author: Maria Luisa Peña Gallo  
Tutor: Ana García Juanatey**

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## LIST OF ABBREVIATIONS

AAAS	American Association for Advancement of Science
CERN	European Organization for Nuclear Research
CFSP	Common Foreign and Security Policy
DG RTD	Directorate General for Research and Innovation
DMO	Destination Management Organisation
EC	European Commission
EEAS	European External Action Service
EIB	European Investment Bank
EIC	European Innovation Council
EIF	European Investment Fund
EIS	European Innovation Scoreboard
EIT	European Institute of Innovation and Technology
ERA	European Research Area
ERAC	European Research Area and Innovation Committee
ERC	European Research Council
ERIC	European Research Infrastructure Consortium
ESFRI	European Strategy Forum on Research Infrastructures
EU	European Union
EU-MACS	European Market for Climate Services
FDI inflows	Foreign Direct Investment inflows
FPs	Research & Innovation Framework Programmes
GDS-Index	Global Destination Sustainability Index
GERD	Gross Domestic Expenditure on R&D
GHG	Greenhouse Gas Emissions
GII	Global Innovation Index
H2020	Horizon 2020
ICTs	Information and Communication Technologies
IP	Intellectual Property
JRC	European Commission Joint Research Centre

KAVAs	KIC added value activities
KICs	Knowledge & Innovation Communities
MS	Member States
NGOs	Non-Governmental Organisations
OECD	Organisation for Economic Co-operation and Development
OI2	European Commission's Open Innovation 2.0 policy
OID	Open Innovation Diplomacy
PCT	Patent Cooperation Treaty
PRIMA	Partnership for Research and Innovation in the Mediterranean Area
R&D	Research and Development
RIO-PSF	Research and Innovation Observatory Policy Support Facility
RISE	Research, Innovation and Science Expert group
RS	The Royal Society
SAM	Scientific Advice Mechanism
SAPEA	Scientific Advice for Policy by European Academies consortium
SDGs	Sustainable Developmental Goals
SFIC	Strategic Forum for International Cooperation
SIS	Swedish Innovation Strategy
SMEs	Small and Medium Enterprises
STI	Science, Technology and Innovation
S4D4C	Using Science for/in Diplomacy for addressing global Challenges project
WIPO	World Intellectual Property Organization

## INTRODUCTION

In the context of our present globalised world, innovation can be one of the best channels for achieving in one hand, economic growth and in the other, sustainable development, because innovation is “the process, including its outcome, by which new ideas respond to societal or economic needs and demands, and generate new products, services or business and organisational models that are successfully introduced into an existing market or that are able to create new markets and that provide value to society.”<sup>1</sup>

Furthermore, it is an essential tool, part of a burgeoning type of public diplomacy labelled as *Science, Technology and Innovation Diplomacy* (STI Diplomacy), which is becoming more relevant in international affairs as it is a wide-ranging solution for global challenges such as climate change, pandemics, natural disasters, nuclear proliferation or cyber security to mention some of them.

The world is highly interconnected as a consequence of the last phase of globalisation, which started at the last third of the twentieth century, when the magnitude of people’s interaction from remote places and the speed at which they have been connecting increased exponentially. The cause of the accelerated amplification of social, economical and political networks and relations is due to the technological progress in trade, transport and Information and Communication Technologies (ICTs).

The universal, rational and transparent nature of science offers a new way of understanding international relations and organisations, which can help underpin good governance and build trust between nations<sup>2</sup>. Scientific cooperation, both bilateral and multilateral, is a win-win practice for progressing in the welfare of contemporary nations and the well-being of their citizens. Besides, it is the main trend for heightening nation’s competitiveness.

One challenge for Europe is how it might acquire a competitive advantage in digital innovation by developing open, public and distributed infrastructures and experimenting with new economic models that are inclusive and sustainable, based on solidarity and the common good rather than winner-take-all marketplaces whose dominant players set the terms of innovation and competition.<sup>3</sup>

On one side, the European Union (EU) is the role model for economic integration, however it still has a weak role geopolitically and diplomatically speaking, as the Common Foreign and Security Policy (CFSP) is the second pillar of the EU and is subject to the method of intergovernmental cooperation through the Council as the main forum of consultation, respecting *Foreign Affairs* as a competence of each Member State. Almost 30 years afterwards, the words of the former Belgian Minister of Foreign Affairs Eyskens are still echoing in our days: “Europe is an economic giant, a political dwarf and a military worm.”

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<sup>1</sup> European Institute of Innovation & Technology (EIT). *Innovation* [online]. Website [Accessed on 2 June 2020]. Available at: <<https://eit.europa.eu/our-activities/innovation>>

<sup>2</sup> The Royal Society. *New frontiers in science diplomacy* [online]. RS Policy document. The Royal Society, 2010. [Accessed on 1 June 2020]. Available at: <[https://royalsociety.org/%7E/media/Royal\\_Society\\_Content/policy/publications/2010/4294969468.pdf](https://royalsociety.org/%7E/media/Royal_Society_Content/policy/publications/2010/4294969468.pdf)>

<sup>3</sup> Digital Social Innovation. *Digital social innovation, a relatively new concept* [online]. 2015. [Accessed on 1 June 2020]. Available at: <<https://digitalsocial.eu/blog/5/digital-social-innovation-a-relatively-new-concept>>

Therefore, it is imperative to boost STI diplomacy within the CFSP and harmonised it with the European policy for Research and Technological Development (RTD) through strategies, initiatives, institutions and funding programmes.

On the other side, European welfare systems are confronted with the challenging issue of calibrating the past and the future, or in other words, *juggling* with already acquired rights and supporting innovation in the welfare systems that would provide a fairer *intergenerational divide*.<sup>4</sup> Here is where *social innovation* enters into scene as a unique perspective to link better sustainable economic and technological methods and solutions for human-centered problems and needs, focusing on the common good.

Sweden is the top leader of innovation among the Member States (MS) of the EU according to the *European Innovation Scoreboard 2020* and occupies the second place as the most innovative country in the world according to the *Global Innovation Index (GII)*. Sweden can improve its STI diplomacy, in the sense of fostering “the use of scientific collaborations among nations to address the common problems facing 21<sup>st</sup> century humanity and to build constructive international partnerships”<sup>5</sup> through its leadership in innovation, by collaborating with third parties and making the EU a forefront international body in this soft power.

The aim of this research paper is to analyse the European Science, Technology and Innovation landscape and assess its potential to launch an effective STI Diplomacy strategy for the European Union. In line with the purpose of the study, the hypothesis formulated would be the following: Sweden could assume a leading role in European STI Diplomacy as a catalyst allowing the EU to eventually become the top global socially innovative player.

The methodology followed is an empirical-analytical study that focuses on the explanation of the European STI diplomacy through deductive reasoning that uses existing theory and operational concepts as a foundation for the formulated hypothesis, employing a mix method as the *STI Diplomacy* and *European STI Union* chapters are generally qualitative analysis extracted from academic papers and EU published documents; inversely the *Sweden's performance on innovation* chapter uses predominantly quantitative data seaming from European official statistics and recognised indexes with well built indicators.

This paper is structured in three chapters: The first one explains what STI Diplomacy is through its main theoretical approaches presented in chronological order, then the description of the main stakeholders, and in the last subsection the summary of the innovation helical theory and its link to open innovation diplomacy. The second chapter is divided into two key parts: the European STI scheme through its institutions, framework programmes, research infrastructures, scientific collaborations, smart, sustainable and inclusive strategy and at the end highlighting the European social innovation perspective; and the second part discusses the EU STI diplomacy through its ecosystem, participation of its Members States, the vision and implementation of this diplomacy, the remarks made by experts and the special mention of the first EU STI diplomacy cluster. The third and final chapter revolves around Sweden's innovation performance by first exposing its national innovation strategy for 2020, then

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<sup>4</sup> European Commission. *Leveraging digital social innovation perspectives from the IESI knowledge map* [online]. JRC Directorate Growth & Innovation, Human Capital & Employment Unit, IESI Research. JRC Insights – Social Policy Innovation Series, 2, 2017, p. 6. [Accessed on 4 June 2020]. Available at: <<https://ec.europa.eu/jrc/sites/jrcsh/files/jrc105678.pdf>>

<sup>5</sup> Fedoroff, N. *Science Diplomacy in the 21st Century* [online]. Cell, 136, 2009, pp. 9-11 [Accessed on 12 June 2020]. Available at: DOI: <<https://doi.org/10.1016/j.cell.2008.12.030>>

showing its involvement in the Horizon 2020 framework programme, afterwards presenting its results and scores at: Europe 2020 headline indicators scoreboard, the European Innovation Scoreboard 2020 (EIS), and finally at the Global Innovation Index 2019 (GII).

Subsequently, after the country's innovation position is exposed, there is a special mention of the importance of the *glocal* dimension, citing Gothenburg as a paradigm of an innovative cluster and a sustainable Swedish city by winning first place four years in a row at the Global Destination Sustainability (GDS) Index, and furthermore this year recognised as the European Capital of Smart Tourism.

## 1. SCIENCE, TECHNOLOGY & INNOVATION (STI) DIPLOMACY

### 1.1 Conceptual framework

Firstly, it is imperative to define the 5 key concepts indispensable to understanding the whole context of the present research paper. These are articulated in alphabetical order and are: *clusters, diplomacy, innovation, Science, Technology and Innovation (STI), and social innovation.*

*Clusters* are innovation activities that tend to be geographically concentrated in specific clusters linked to a single city or a set of neighbouring cities. Consequently, to get a comprehensive approach of innovation it is necessary to adopt the cluster perspective. The Global Innovation Index (GII) has recognized that innovation hubs at the urban areas often become drivers of innovation performance.<sup>6</sup>

*Diplomacy* is “the use of dialogue, negotiation and representation in international relations. Embassies and consulates that a country deploys abroad are key components of diplomatic infrastructure”<sup>7</sup>.

The model of traditional bilateral diplomacy is rooted in the *Vienna Convention on Diplomatic Relations* (1961), although this logic has dominated international relations long before the treaty was ratified, back when the Nation States were consolidated and they were the only legitimate powers on the international stage.

During the Cold War and specially when the Soviet Union dissolved, multilateral scenarios had been formulated through the creation of international and regional organisations where the community of nations has experienced deep transformations, such as a new balance of powers and a growth of networks of interdependence that go beyond national and regional boundaries. Along with a more complex and interconnected world, new actors on the global scene have appeared as relevant stakeholders in public diplomacy such as Small and Medium Enterprises (SMEs), universities, Non-Governmental Organisations (NGOs) and civil society movements.

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<sup>6</sup> Bergquist K., Fink C., Raffo J., *Identifying and ranking the world's largest clusters of inventive activity* [online]. Economic Research Working Paper, 34, World Intellectual Property Organization (WIPO), 2017. [Accessed on 1 June 2020]. Available at: <<https://www.wipo.int/publications/en/details.jsp?id=4189&plang=EN>>

<sup>7</sup> Ruffini, P-B., *Science and Diplomacy: A New Dimension of International Relations*, Science, Technology and Innovation Studies. Springer International Publishing, 2017. ISBN-10: 3319551035.

These new players take advantage of international conferences to express themselves, lobby and influence the international legal framework.<sup>8</sup>

For instance, today's countries' soft-power tools or intangible assets such as culture, tourism, gastronomy, science, technology and innovation<sup>9</sup> are new ways to influence international reputation, generate global branding and ultimately be perceived as a global decision maker. This contrasts to the use of coercive means, such as military power or economic pressure, the traditional *hard power* tools. Therefore, countries may combine strategically hard- and soft-power tools in what can be framed as "smart power"<sup>10</sup>.

*Innovation* "is the ability of individuals, companies and entire nations to continuously create their desired future."<sup>11</sup> It may not be the most accurate definition for innovation but it is the most inspiring one, giving the vision this research paper is looking for.

The simplest description for innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process).<sup>12</sup>

The meaning of innovation can signify both an action and the result of that action. It is comparable by applying common reference points for novelty and utility, involves other basic concepts such as value creation or preservation, and requires a significant difference to be appreciated.

Furthermore, "sound measurement of innovation and the use of innovation data in research can help policy makers better understand economic and social changes, assess the contribution of innovation to social and economic goals, and monitor and evaluate the effectiveness and efficiency of their policies."<sup>13</sup>

Nowadays, innovation is not seen just as the creation of value based on research and technological development. The process of innovation depends on relationships, exchange of information, reciprocal learning and new forms of collaboration between actors of different areas of expertise.

New ways of creating and sharing knowledge and other resources changes the innovation processes and investments in intellectual property. The digital revolution is creating entirely new possibilities for

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<sup>8</sup> Elorza A., Lacunza I., & Melchor L. *What Is Science Diplomacy?* [online]. S4D4C European Science Diplomacy Online Course, Module 2, 2020. [Accessed on 10 June 2020]. Available at: <<https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>>

<sup>9</sup> Copeland, D., *Guerrilla Diplomacy: Rethinking International Relations*. Boulder: Lynne Rienner Publisher. 2009, ISBN: 978-1-58826-679-8.

<sup>10</sup> Nye, J., *Soft Power: The Means to Success in World Politics*. Public Affairs: New York., 2004, ISBN: 978-1586483067.

<sup>11</sup> KAO J. *Innovation nation: How America is losing its innovative edge, why it matters, and what we can do to get it back*. Free Press, 2007, pp. 320.

<sup>12</sup> OECD/Eurostat. *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition* [online]. The Measurement of Scientific, Technological and Innovation Activities, p. 22, 2019. [Accessed on 8 June 2020]. Available at: <<https://doi.org/10.1787/9789264304604-en>>

<sup>13</sup> Ibidem, p. 19. – *Since 1992, the Oslo Manual has been the international standard of reference for conceptualising and measuring innovation* –.



involving users and customers in innovations and creating new services, e.g., based on 'open data'. This concerns everything from transport solutions to culture and public services.<sup>14</sup>

*Science, Technology and Innovation (STI)* has been a global enterprise or joint endeavour throughout history and many different civilisations. In recent history (during the 20<sup>th</sup> century) national governments have been assisted by the United Nations and the Organisation for Economic Co-operation and Development (OECD) in forming their own research and development systems, and contributing to establish a common language and policy area.

As a consequence, the international science system comprises a rich constellation of stakeholders: international scientific organisations, national governments and research councils involved in funding research and innovation, academic institutions such as universities, research centres and public foundations, international and national academies and learned societies, large research infrastructures, large companies and SMEs, NGOs, private foundations and charities involved in funding and many different stakeholders interacting at all levels of governance.<sup>15</sup>

Likewise in diplomacy, globalisation and digitalisation has impacted STI as it has improved the exchange of knowledge, resources and talent, consequently new scientific powers and nations have emerged in Asia, the Middle East and North Africa, shifting into an increasingly multipolar scientific world, where Western nations no longer retain the control or are leaders in the field.

Some of the good reasons for linking science with diplomacy is that STI are drivers of economic progress, equitable, humanitarian and sustainable development; and evidence-based decision-making and public policy development, thus are necessary to implement in foreign policy as well<sup>16</sup>. Science is a driver for international cooperation to reach common goals<sup>17</sup>.

*Social innovation* is a very dynamic concept that has been generating huge interest among different areas. That is why it is necessary to define it from a variety of approaches as the Social Innovation Academy suggests<sup>18</sup>:

From a pragmatic approach, social innovations are “innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social.”<sup>19</sup>

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<sup>14</sup> Swedish Ministry of Enterprise, Energy and Communications. *The Swedish Innovation Strategy* [online]. 2014 p.10. [Accessed on 8 June 2020]. Available at: <<https://www.government.se/information-material/2012/10/the-swedish-innovation-strategy/>>

<sup>15</sup> Elorza A., Lacunza I., & Melchor L. *op.cit.* in note 8. [Accessed on 10 June 2020].

<sup>16</sup> Copeland, D. *Bridging the Chasm: Why Science and Technology Must Become Priorities for Diplomacy and International Policy* [online]. *Science & Diplomacy*, Vol. 4, No. 3. [Accessed on 11 June 2020]. Available at: <<http://www.sciencediplomacy.org/perspective/2015/bridging-chasm>>

<sup>17</sup> Grimes, R. & Hennessey, E. *Why Science Is in the Diplomatic Toolkit* [online]. *Science in Parliament*, Vol. 72, No. 2, 2015 . [Accessed on 11 June 2020]. Available at: <<https://www.scienceinparliament.org.uk/wp-content/uploads/2015/06/WHY-SCIENCE-IS-IN-THE-DIPLOMATIC-TOOL-KIT-by-Professor-Robin-Grimes-and-Dr-Emma-Hennessey.pdf>>

<sup>18</sup> Social Innovation Academy. *Introduction to Social Innovation* [online]. [Accessed on 9 June 2020]. Available at: <<http://www.socialinnovationacademy.eu/introduction-to-social-innovation/>>

<sup>19</sup> Mulgan, G. *The Process of Social Innovation, in Innovations. Technology, Governance, Globalizations*, Spring, MIT press, Boston, 2006, p. 146.

The managerial perspective sees it as a “new solution to a social problem which is more effective, efficient, sustainable, or fairer compared to existing solutions, and which generates value primarily for society instead of single individuals or organisations”<sup>20</sup>

If social innovation is analysed from a critical approach then it is conceived as a process of “empowerment and political mobilisation” targeting a bottom-up transformation of the functioning of a social system, in terms of stakeholders and in terms of distribution of material and immaterial resources<sup>21</sup>

The systematic approach states that social innovation is a “complex process through which new products, processes or programmes are introduced, leading to a deep change in daily routines, resources’ streams, power relations or values within the system affected by the innovation.”<sup>22</sup>

A universal approach relates it to “new solutions (products, services, models, markets, processes etc.) that simultaneously meet a social need (more effectively than existing solutions) and lead to new or improved capabilities and relationships and better use of assets and resources. In other words, social innovations are both good for society and enhance society’s capacity to act.”<sup>23</sup>

## 1.2 Science Diplomacy Approaches

### 1.2.1 The Frontiers of Science Diplomacy

In 2009, The Royal Society (RS) and the American Association for Advancement of Science (AAAS) held a conference in London, which represented a milestone in the narrative of this type of public diplomacy. The outcome of this important meeting was a policy report entitled “New frontiers in Science Diplomacy”<sup>24</sup> that comprises the first taxonomy for science diplomacy, which is: science in diplomacy, diplomacy for science, and science for diplomacy:

*Science in Diplomacy* is basically informing foreign policy objectives with scientific advice. The general purpose is to improve foreign policy actions through the use of scientific knowledge. The creation of science advice mechanisms for informing policy-making or the role of national academies and learned societies as a source of independent scientific advice to international policy makers are two examples of this approach.

*Diplomacy for Science* entails facilitating international science cooperation. The overall goal is to benefit from international science and technology resources in order to improve national capacity, as well as to build up joint partnership projects that one country alone could not

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<sup>20</sup> Phills J., K. Deiglmeier & Miller D. *Rediscovering Social Innovation* [online]. Stanford Social Innovation Review, 2008. [Accessed on 9 June 2020]. Available at: <[https://ssir.org/articles/entry/rediscovering\\_social\\_innovation#](https://ssir.org/articles/entry/rediscovering_social_innovation#)>

<sup>21</sup> Moulaert, F. (2009). *Social Innovation: Institutionally Embedded, Territorially (Re)Produced*. Social Innovation and Territorial Development, 2009, pp. 11–23.

<sup>22</sup> Westley, F., & Antadze, N. *Making a difference: Strategies for scaling social innovation for greater impact*. Innovation Journal, 15, 2, 2010, p. 1–19.

<sup>23</sup> The Young Foundation. *Social Innovation Overview: A deliverable of the project: “The theoretical, empirical and policy foundations for building social innovation in Europe”* [online]. TEPSIE, European Commission – 7<sup>th</sup> Framework Programme, Brussels: European Commission, DG Research, 2012, pp. 43. [Accessed on 10 June 2020]. Available at: <<https://youngfoundation.org/wp-content/uploads/2012/12/TEPSIE.D1.1.Report.DefiningSocialInnovation.Part-1-defining-social-innovation.pdf>>

<sup>24</sup> The Royal Society. *op.cit.* note 2. [Accessed on 3 June 2020].

undertake. Sometimes scientific and engineering joint collaborations require diplomatic assistance to build up research partnerships between governments and other institutions such as contract negotiations, intellectual property, and visa regulations. Research funding needs explicit diplomatic interactions of actions with elements of standardizing, safeguarding and mediating.

*Science for Diplomacy* is about science cooperation to improve international relations, based upon a non-ideological basis, between countries when there are difficult bilateral relations, or they have unsolved common problems, or when diplomatic relations are to be initiated. It draws on the soft power of science to attract, persuade and influence both as a national asset, and as a universal activity that transcends national interests. The goal is to support foreign policy by mobilising scientific networks. Two exemplary actions are educational scholarships, or science festivals and exhibitions.

### ***1.2.2 Strategic Purpose Approach***

The authors of this categorisation distinguish between three strategic purposes: access, promotion and influence<sup>25</sup>.

*Access'* strategic purpose consists in improving national innovation capacity and competitiveness. To achieve this, its goals are, to better benchmark international research and development trends and policies, to observe and seize knowledge and technology markets worldwide, and to attract talents and investments from abroad. Access-driven actions can be used to ease tensions between states, build trust, manage or prevent conflicts, or to undertake extremely expensive "big science" projects that no country can afford to run alone.

*Promotion's* strategic purpose focuses on the marketing of a country's accomplishments in the research and development arena and raising interest in a nation's Science and Technology areas, therefore improving its reputation. The aims of this strategy are to attract students, researchers and companies, build up national capacities, reputation and performance, stir innovations and enhance its innovative capacities, and lay the groundwork for international partnerships.

*Influence's* strategic purpose addresses the most explicit political and soft power dimension of this type of diplomacy, influencing other countries' public opinion, decision-maker and political or economic leaders. Science and technology activities are a promising entry point for engaging citizens and civil society organisations worldwide. The universal values of science and a more rational approach in policy-making processes that will reinforce democracy, are both embedded in this policy goal. The main challenge of this, as opposed to international science cooperation, is bringing together the world of science and diplomacy, teaming up professionals and different players with a set of particular strategic interests and global concerns.

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<sup>25</sup> Flink, T. & Schreiterer, U., *Science diplomacy at the intersection of S&T policies and foreign affairs: toward a typology of national approaches* [online]. *Science and Public Policy*, 37, 9, 2010, pp. 665–677. DOI: 10.3152/030234210X12778118264530. [Accessed on 8 June 2020]. Available at: <[https://www.academia.edu/4031307/Flink T. Schreiterer U. 2010 Science diplomacy at the intersection of S and T policies and foreign affairs toward a typology of national approaches. In Science and Public Policy 37 9 pp. 665-677](https://www.academia.edu/4031307/Flink_T._Schreiterer_U._2010_Science_diplomacy_at_the_intersection_of_S_and_T_policies_and_foreign_affairs_toward_a_typology_of_national_approaches)>

### 1.2.3 Pragmatic Approach

This utilitarian perspective comes from chief scientific advisers to Foreign Ministries who have dealt empirically with science diplomacy, and consequently have re-classified depending if the actions are designed to address, meet or advance either national, cross-border or global needs or interests<sup>26</sup>.

*Actions designed to directly advance a country's national needs.* This group is comprised of the exercise of soft power to increase the impact of a country worldwide. It leads the country to act more strategically in identifying how science relationships can promote trade and advance broader diplomatic interests, or to assist in development with science information and building science partnerships between donor and recipient countries. The economic dimensions also fall within this category, as gradually more scientific and health parameters are included in trade regulations, intellectual properties and manufacturing products among different countries.

*Actions designed to address cross-border interests.* These involve bilateral or cross-boundary issues, the use or access to shared resources (such as gas fields, fish stocks, etc.), and the exploitation of shared technical services (pharmaceutical regulation, food safety assessment, etc.).

*Actions primarily designed to meet global needs and challenges.* In this group, we would include the Sustainable Developmental Goals (SDGs), which comprise a global context for development and partnership where both developed and developing countries can have measurable goals for increasing their international and domestic development activities. The SDGs provide an excellent meeting point for global interests and national priorities.

### 1.2.4 Madrid Declaration on Science Diplomacy

The first S4D4C “Using Science for/in Diplomacy for addressing global Challenges” Global Network Meeting took place in Madrid on December 2018 under the slogan “EU science diplomacy beyond 2020”. Because of their discussions, worldwide high-level experts on the field endorsed the “Madrid Declaration of Science Diplomacy”<sup>27</sup>.

The Madrid Declaration refuses to strictly define science diplomacy; instead, it understands it as “a series of practices at the intersection of science, technology and foreign policy”. Its principles are the following:

- *Value for citizens:* governments, diplomats and researchers are encouraged to acknowledge and demonstrate science diplomacy as a fundamental and universal tool to improve international relations in general.
- *Methodological diversity:* not all relevant science diplomacy practices are labelled as such, assigning the label is a strategic choice.
- *Demonstrable impact:* to the measurement and recognition of the potential effect or impact of science diplomacy activities.

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<sup>26</sup> Gluckman, P.D.; Turekian, V.; Grimes, R.W.; and Kishi, T., *Science Diplomacy: A Pragmatic Perspective from the Inside* [online]. Science Diplomacy, 6, 4, 2017. [Accessed on 8 June 2020]. Available at: <[http://www.sciencediplomacy.org/files/pragmatic\\_perspective\\_science\\_advice\\_dec2017\\_1.pdf](http://www.sciencediplomacy.org/files/pragmatic_perspective_science_advice_dec2017_1.pdf)>

<sup>27</sup> S4D4C. *The Madrid Declaration on Science Diplomacy* [online]. 2019. [Accessed on 11 June 2020]. Available at: <<https://www.s4d4c.eu/s4d4c-1st-global-meeting/the-madrid-declaration-on-science-diplomacy/>>

- *Evidence-informed foreign-affairs policies*: which can either be content-related (e.g. climate change), context-related or process-related.
- *Collaboration and inclusion*: the need to recognize the role of multiple stakeholders in science diplomacy beyond the classical nation-states, bringing forth new governance and coordination mechanisms that need to be considered.
- *Capacity building*: all stakeholders would benefit from exchange and suitable capacity-building activities fostering cutting-edge, interdisciplinary and intergenerational spaces.
- *Independence of science*: where scientific autonomy is respected and not distorted by ideological goals.

### 1.3 STI Diplomacy Stakeholders

The S4D4C Science Diplomacy course differentiates between two types of stakeholders' classification, according to their work-professional nature or in the grounds of the scope of collaboration networks.

On one hand, the types of science diplomacy stakeholders according to their work-professional nature are classified in five groups. For the interest of this research paper the author is going to just mention and give examples of the five types, and describe two of them (the subnational government and the supranational bodies) in depth,.

The *governmental & public* would be the first category, and is composed of ministries, departments, administration bodies, institutions and agencies.

It is necessary to remark that *nations* are still considered the most important stakeholders in the international relations system, as they hold sovereignty, international recognition and legal equality status. The importance of STI in the countries' foreign policy affairs is reflected in its national strategic objectives.

Within this first group, are the *subnational government* stakeholders, public-administrative entities such as regions and cities that are becoming key players on the global scene. They usually engage internationally to raise their profile for cultural or economic purposes; some deploy STI policies to promote research and development as well as attract new talent; few of them are exploring ways to engage with other stakeholders in a joint science diplomacy strategy.

Worthy of special mention are large metropolitan areas as they have always had a global impact. As a matter of fact, some of them are even thinking and applying science diplomacy strategies both to increase their presence worldwide and to project an image of a friendly ecosystem for STI actors and potential investments.

Their main interests of the subnational government stakeholders are:

- Promote local/regional STI ecosystem to attract foreign investments & scientific talent
- Foster STI collaboration between institutions from different regions and cities
- Facilitate local/regional companies to have a good place in the intl. innovation market as well as in the R&D intl. arena
- Increase the importance and impact of STI policies in the local/regional governance

- Increase their role in intl. summits and org. through the use of their STI systems
- Networking with other local/regional entities for addressing common challenges

The main challenge for coordination in a multi-actor-network is the sorting out of delegation competences. In democratic states, political actors as the rightful custodians of societal interests (...), have little steering competences over scientific actors (...) and need to resort to soft governance approaches (incentive mechanisms, competition, networked information flows, sensitive use of language). But to gain impact on the global scene, to tap into international markets, to attract investment and talent to regions, it is essential for all these actors to find a common ground and coherence first. It is also important to recognise that these actors and specially research and innovation networks also bring different standards to the conduct of international S&T co-operation that may not be common across countries, generating scientific and societal challenges.<sup>28</sup>

The second group is the *intergovernmental, transnational & supranational* stakeholders, which are organisations and related institutions in global governance. In science diplomacy, they are crucial actors in setting a global agenda for common policy goals.

Inside this category, the *supranational* bodies refer to organisations that entail a process of integration of different nation states under the umbrella of a supranational entity by actively transferring part of their sovereignty and ensuring coordination and implementation of common policies in all member states, such as the EU.

The remaining three groups in this classification are only listed with some examples: *research & academic* like councils, universities, centres, academies, learned societies, individual committed scientists; *private & industry sector* such as multinationals, small and medium enterprises (SMEs) with intl. projection; and *organised civil society* that can be national and international NGOs, charities, and even individual lobbyists and activists.

On the other hand, the four types of science diplomacy stakeholders according to their collaborative network scope or levels of participation are: *local, national, regional and global networks*.

For the purpose of this research, it is important to highlight when the focus is on the local level as its prototype is the global city:

Global cities that build local stakeholders networks from different backgrounds and expertise can project the image of their urban homeland as a STI-friendly global actor. Local networks can actually promote a city STI diplomacy strategy in order to develop this place as an influential global player in tackling humanity's grand challenges through science and technology.<sup>29</sup>

### ***1.3.1 The Innovation Helical Theory and the Open Innovation Diplomacy***

The central component of the helical system is *knowledge*, which, flowing through societal subsystems, transforms into innovation and *know-how* for society and economy.

In 1995 Henry Etzkowitz and Loet Leydesdorff first settled the innovation helical framework theory. The traditional triple helix innovation model focuses on university–industry–

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<sup>28</sup> Elorza A., Lacunza I., & Melchor L. *Who are the Science Diplomacy Stakeholders?* [online]. S4D4C European Science Diplomacy Online Course, Module 3, 2020. [Accessed on 12 June 2020]. Available at: <<https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>>

<sup>29</sup> Ibidem.

government stakeholder interactions to provide the infrastructure necessary for innovative and economic development.<sup>30</sup>

Afterwards, the quadruple and quintuple helix innovation framework was co-developed by Elias G. Carayannis and David F.J. Campbell in 2009 and 2010 respectively. It describes university-industry-government-public-environment interactions within a knowledge economy.

The quadruple helix system<sup>31</sup> brings in the perspective of the media-based and culture-based public as well as that of civil society. Some features of the quadruple helix are: values and lifestyles; multiculturalism and creativity; and multi-level innovation systems (local, national, global), with universities of the sciences, but also universities of the arts. The democracy of knowledge as a concept and metaphor highlights and underscores parallel processes between political pluralism in an advanced democracy, and knowledge and innovation heterogeneity and diversity in an advanced economy and society.

The quintuple helix<sup>32</sup> emphasizes the natural environments of society, also for the knowledge production and innovation. It adds socio-ecological interactions, meaning it can be applied in an interdisciplinary and transdisciplinary way to sustainable development. It has visualised the collective interaction and exchange of knowledge in a state by means of five subsystems: education, economic, natural, media-based, culture-based public (also civil society) and political systems. Each of the five helices has an asset at its disposal, with societal and scientific relevance: human, economic, natural, social, information and political capital.

The quadruple helix has been applied to European Union-sponsored projects and policies, including the EU-MACS (European Market for Climate Services) project, a follow-up project of the European Research and Innovation Roadmap for Climate Services, and the European Commission's Open Innovation 2.0 (OI2) policy for a digital single market that supports open innovation.

The concept of *open innovation diplomacy* (OID) encompasses the concept and practice of bridging distance and other divides (cultural, socioeconomic, technological, etc.) with focused and properly targeted initiatives to connect ideas and solutions with markets and investors ready to appreciate them and nurture them to their full potential. In this sense, OID qualifies as a new and novel strategy, policy-making, and governance approach in the context of the quadruple and quintuple innovation helices.<sup>33</sup>

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<sup>30</sup> Etzkowitz, H., Leydesdorff, L. *The Triple Helix – University-Industry-Government relations: A laboratory for knowledge based Economic Development* [online]. EASST Review 14,1. 1995. [Accessed on 15 June 2020]. Available at: <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2480085](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2480085)>

<sup>31</sup> Carayannis E.G., Campbell D.F.J., “Mode 3” and “Quadruple Helix”: towards a 21<sup>st</sup> century fractal innovation ecosystem [online]. International Journal of Technology Management (IJTM) 46,3/4, 2009. [Accessed on 16 June 2020]. Available at: DOI: [10.1504/IJTM.2009.023374](https://doi.org/10.1504/IJTM.2009.023374)

<sup>32</sup> Carayannis E.G., Campbell D.F.J., *Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other? : A Proposed Framework for a Trans-disciplinary Analysis of Sustainable Development and Social Ecology* [online]. International Journal of Social Ecology and Sustainable Development. 2010. DOI: 10.4018/jesd.2010010105 [Accessed on 15 June 2020]. Available at: <<https://www.igi-global.com/article/triple-helix-quadruple-helix-quintuple/41959>>

<sup>33</sup> Carayannis E.G., Campbell D.F.J., *Open Innovation Diplomacy and a 21st Century Fractal Research, Education and Innovation (FREIE) Ecosystem: Building on the Quadruple and Quintuple Helix Innovation Concepts and the “Mode 3” Knowledge Production System*. Journal of the Knowledge Economy 2,327, 2011. [Accessed on 16 June 2020]. Available at: <<https://doi.org/10.1007/s13132-011-0058-3>>

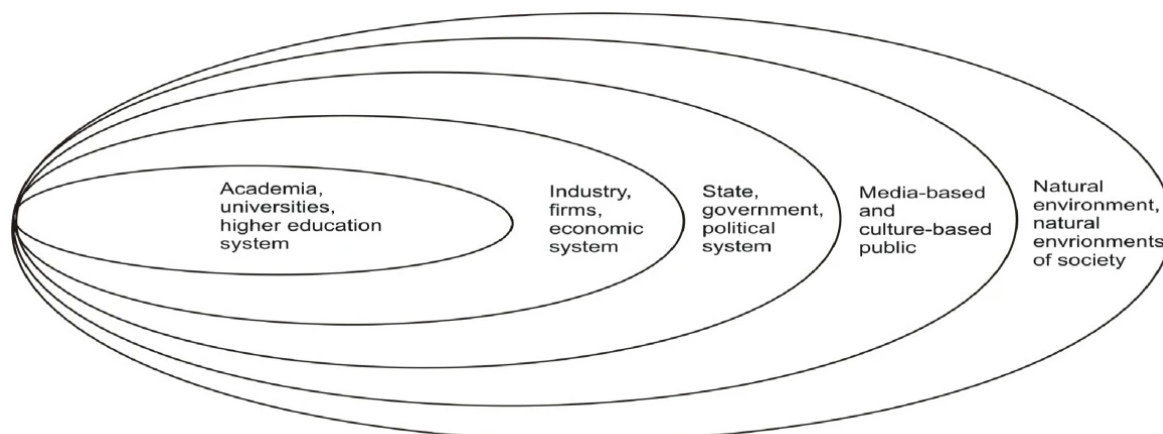


Figure 1. *The subsystems of the Quintuple Helix model.* Source: Carayannis E.G., Campbell D.F.J. (2010)

## 2. THE EUROPEAN SCIENCE, TECHNOLOGY & INNOVATION UNION

The European Union is a paramount example of the process of political integration between member states, their governments (represented in the Council of the European Union) and their citizens (represented by elected members of the European Parliament) that co-decide on policies, mostly proposed and executed by the European Commission. In the EU, all members decide (Council) and vote (Council and Parliament) on policies that will then affect national and subnational levels. The benefits of this polity are the synergies derived from social and economic policies and a stronger presence on the international stage, while the depth of European integration varies according to policy fields.<sup>34</sup>

During the 90s and early 2000s the EU had its best time in terms of stability and growth, as the second big enlargement period happened, and for the interest of this study in 1995 Sweden joined the Union.

Afterwards, the EU has suffered a wave of different crises over the last decade. The economic and euro crisis, the Brexit crisis, the migration crisis, the COVID-19 crisis and the rise of Euroscepticism, have altogether altered the EU integration process and rule-based multilateralism, which may have shifted instead towards a de-facto speeds approach between MS, rather than an ever-closer Union.

### 2.1 The European Science and Innovation Scheme

Research and innovation are key drivers to make a better and more sustainable EU. Still MS have their own research policies and funding schemes, holding important differences among countries and regions in the EU.

The role of the European Commission (EC) and its interaction with MS and regions is defining R&D&I European policies and funding to better work together.

Also, it aims to understand, respect and tap into the diversity of the national, including regional, research and innovation systems. Moreover, it aims to achieve a more synchronised co-evolution of R&I systems, to strengthen their quality and excellence, to reduce the existing inequalities and fragmentation and to

<sup>34</sup> Elorza A., Lacunza I., & Melchor L., *How does the European Union Practice Science Diplomacy?* [online]. S4D4C European Science Diplomacy Online Course, Module 4, 2020. [Accessed on 12 June 2020]. Available at: <https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>



foster connectivity, collaboration and complementarities, thus maximizing the effectiveness of the ERA at all levels<sup>35</sup>.

EU fosters Responsible Research and Innovation (RRI) where researchers, citizens, policy makers, business, and third sector organisations work together during the whole research and innovation process in order to design inclusive and sustainable research and innovation. Public engagement, open access, gender equality, ethics and science education are at the core of this transversal European policy.<sup>36</sup>

The next subsections are going to briefly explain the EU research and innovation landscape, which consists in the framework programmes and the European Research Area.

### ***2.1.1 The European Research Area (ERA)***

The European Research Area (ERA) is meant to be a unified research area open to the world and based on an internal market. It is grounded on Art. 179 of the Treaty of the Functioning of the European Union (TFEU), where the Research & Technological Development (RTD) policy is contained: “the Union shall have the objective of strengthening its scientific and technological bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely.”

The six priorities of the ERA are<sup>37</sup>:

- More effective national research systems
- Optimal transnational cooperation and competition, including optimal transnational cooperation and competition and research infrastructures
- An open labour market for researchers
- Gender equality and gender mainstreaming in research
- Optimal circulation, access to and transfer of scientific knowledge including knowledge circulation and open access
- International cooperation

### ***2.1.2 Research & Innovation Framework Programmes (FPs)***

There have been eight R&I framework programmes (FP1–FP8) running between 1984 and 2020, all of them approved by EU Member State governments and the European Parliament.

*a) Horizon 2020, the most ambitious framework programme in EU history*

*Horizon 2020 (H2020)*<sup>38</sup> is the main financial instrument to implement the Innovation Union Flagship, backed with 80 billion euros of funding destined to create real European added value. It is intended to last from 2014 to 2020 bringing together all EU research and innovation funding under a single programme with three key objectives or pillars:

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<sup>35</sup> European Research Area and Innovation Committee – ERAC. *ERAC opinion on the future of the ERA* [online]. 2020 [Accessed on 14 June 2020]. Available at: <<https://data.consilium.europa.eu/doc/document/ST-1201-2020-INIT/en/pdf>>

<sup>36</sup> Elorza A., Lacunza I., & Melchor L., *op. cit. at note 34* [Accessed on 14 June 2020].

<sup>37</sup> European Commission. *European Research Area (ERA)* [website]. [Accessed on 14 June 2020]. Available at: <[https://ec.europa.eu/info/research-and-innovation/strategy/era\\_es#what](https://ec.europa.eu/info/research-and-innovation/strategy/era_es#what)>

<sup>38</sup> European Commission. *Horizon 2020* [website]. [Accessed on 15 June 2020]. Available at: <<https://ec.europa.eu/programmes/horizon2020/en>>

*Excellent science:* Strengthening the EU’s position as a world leader in science and attracting the best talent to work together across Europe

- European Research Council: Supporting top researchers from anywhere in the world to work in Europe.
- Future and Emerging Technologies: Supporting visionary thinking through collaborations between science and engineering.
- Marie Skłodowska-Curie actions: Providing opportunities for training and career development of individual researchers
- Research infrastructures: including e-infrastructure ensuring access to world-class facilities.

*Competitive industries:* Strengthening industrial leadership in innovation to get Europe back on the path to growth and job creation. Emphasising key technologies in areas such as advanced manufacturing, microelectronics, nanotechnology, biotechnology, ICT and space.

*Better society:* Innovating to tackle societal challenges shared by all Europeans, across six key themes: health, demographic change and well-being; food security and sustainable agriculture, marine and maritime research and the bio-economy; secure, clean and efficient energy; smart, green and integrated transport; climate action, environment, resource efficiency and raw materials; inclusive, innovative, reflective, and secure societies.

*b) Horizon Europe, the next research & innovation framework programme*

*Horizon Europe*<sup>39</sup> is the name of the brand new programme that will succeed H2020, and work to foster competitiveness as it is expected to increase GDP by an average of 0.08% to 0.19% over the next 25 years and generate up to 100,000 jobs in R&I activities during the investment phase (2021-2027). The economic activity generated by the programme is expected to foster an indirect gain of up to 200,000 jobs between 2027 and 2036, of which 40% will be highly skilled.

The Commission's initial proposal for Horizon Europe is an ambitious €100 billion budget.

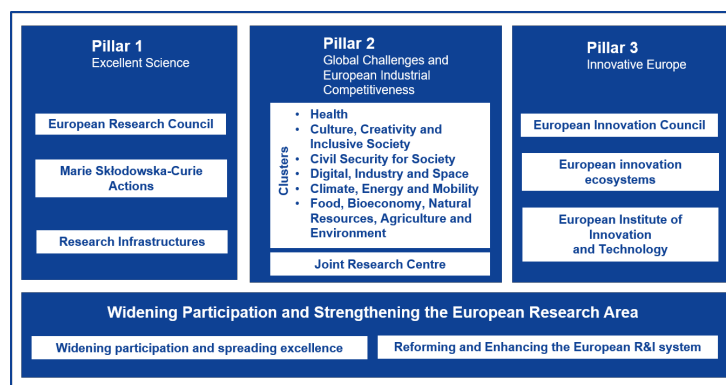


Figure 2. Preliminary structure of Horizon Europe. Source: European Commission

<sup>39</sup> European Commission. *Horizon Europe* [website]. [Accessed on 15 June 2020]. Available at: [https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme\\_en](https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en)

As a cross-cutting issue of broad relevance, social sciences and humanities research is fully integrated into each of the general objectives of Horizon Europe.

R&I Missions will be an integral part of the Horizon Europe framework programme beginning in 2021. Inspired by Professor Mariana Mazzucato and still in the making, missions will better relate the EU's research and innovation to society and citizens' needs.

It is assumed that only at the level of the EU, with its long experience of operating within a multilevel governance system, can the scale and diversity of talent and ideas be found to make real progress against global challenges. A new way of working is also necessary, with scientific disciplines joining forces to bring holistic responses.<sup>40</sup>

The Horizon Europe defines five missions' areas

- Adaptation to climate change, including societal transformation
- Healthy oceans, seas, coastal and inland waters
- Climate-neutral and smart cities
- Soil health and food
- Cancer

### ***2.1.3 European STI institutions and organisations***

The EU scientific and technology institutions complement other funding activities in Europe such as those of the national research funding agencies.

*The Directorate General for Research and Innovation of the European Commission (DG RTD)<sup>41</sup>* falls under the responsibility of the Commissioner for Innovation, Research, Culture, Education and Youth. The department is in charge of EU policy on research, science and innovation, with a view to help create growth and jobs and tackle our biggest societal challenges.

The European Commission (EC) leads the reach of global research partnerships, and at the same time is working on the “Global Research Area”, a worldwide research space where researchers all over the world can work in together in equitable conditions smoothly across borders.

DG RTD plays a crucial role in deploying the EU science diplomacy strategy worldwide through its International Cooperation Unit.

The unit is in charge of fostering international cooperation as it allows:

- Access to the latest knowledge and the best talent worldwide,
- Tackle global societal challenges more effectively,
- Create business opportunities in new and emerging markets, and
- Use science diplomacy as an influential instrument of external policy

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<sup>40</sup> Elorza A., Lacunza I., & Melchor L., *op.cit. in note 34*. [Accessed on 16 June 2020].

<sup>41</sup> European Commission. DG RTD – *DG for Research and Innovation* [website]. [Accessed on 16 June 2020]. Available at: <[https://ec.europa.eu/knowledge4policy/organisation/dg-rtd-dg-research-innovation\\_en](https://ec.europa.eu/knowledge4policy/organisation/dg-rtd-dg-research-innovation_en)>

*The European Research Council (ERC)*<sup>42</sup> focuses on frontier research (new and emerging fields). This may be cross-disciplinary and involve unconventional approaches. ERC promotes “bottom up” or “investigator-driven” research allowing researchers themselves to identify new opportunities and funding competitive grants for scientific excellence. The ERC operates as an autonomous science-led funding body.

ERC opportunities are open to researchers of any nationality and at different stages of their careers who intend to conduct their research activity in any EU country or associated country.

*European Innovation Council (EIC)*<sup>43</sup> is in the pilot phase and aims to support innovations of a breakthrough and disruptive nature, and in this way scale up potential projects that are too risky for private investors (70% of the budget of the EIC earmarked for SMEs)

*The European Commission Joint Research Centre (JRC)*<sup>44</sup> is the science and knowledge service for the EC. The JRC employs scientists to carry out research in order to provide independent scientific advice and support to EU policy.

Along with the EC, the JRC manages and operate six Knowledge Centres according to the following thematic areas: food fraud and quality; territorial policies; migration and demography; disaster risk management; bio economy; and global food security.

The JRC has six sites: Brussels, Geel, Ispra, Karlsruhe, Petten, and Seville. The JRC employs over 3000 people from EU countries and candidate countries to EU membership. Both their research capacity and their expertise in bridging the gap between research, knowledge and policies put them in a privileged place to be part of a lively European Science Diplomacy ecosystem.

*The European Institute of Innovation and Technology (EIT)*<sup>45</sup> founded in 2008 as an innovation delivery mechanism is based in Budapest and aims to strengthen the innovation capacity of European Union countries by integrating higher education, research and innovation, and promoting synergies and cooperation between them.

Even though EIT is an autonomous body, it shares its achievements, new approaches and good practices for the benefit of the EU as a whole.

EIT has shaped a new thriving innovative environment, triggering a change towards a more innovative and entrepreneurial mindset in Europe. It has produced breakthroughs in the way in which business, higher education, and research collaborate. It does so by gathering together individuals from different sectors, backgrounds and disciplines to find solutions to challenges by developing joint innovation projects through Knowledge & Innovation Communities (KICs).

KICs are strategic networks or independent partnerships of higher education establishments, research institutes, companies and other stakeholders in the innovation process. The KICs are

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<sup>42</sup> European Research Council. *ERC, Supporting top researchers from anywhere in the world* [website]. [Accessed on 17 June 2020]. Available at: <<https://erc.europa.eu/>>

<sup>43</sup> European Commission. *Enhanced European Innovation Council (EIC) pilot* [website]. [Accessed on 17 June 2020]. Available at: <<https://ec.europa.eu/research/eic/index.cfm>>

<sup>44</sup> European Commission. *Joint Research Centre (JRC) – EU Science Hub. Bringing together scientific knowledge for Europe* [website]. [Accessed on 17 June 2020]. Available at: <<https://ec.europa.eu/jrc/en>>

<sup>45</sup> European Institute of Innovation & Technology. *EIT. Making innovation happen* [website]. [Accessed on 16 June 2020]. Available at: <<https://eit.europa.eu/>>

funded by the EIT and are selected via calls for proposals and they have a great degree of freedom to define their legal form and composition.

From a pan-European perspective, KICs can link innovation stakeholders from specific environments with others. They help spread the dynamics of established ecosystems across Europe. The EIT model is well positioned to encourage activities that for reasons of market, systems and orientation failure, would otherwise not have happened.

The EIT is also an integral part of H2020 FP, and the funding for innovation projects is given to the KICs specifically for *KIC added value activities* (KAVAs) that support the integration of the knowledge triangle formed by higher education, research and innovation.

The infographic below illustrates very accurately the purpose, means, projects, topics and stakeholders participating in the EIT's dynamics.

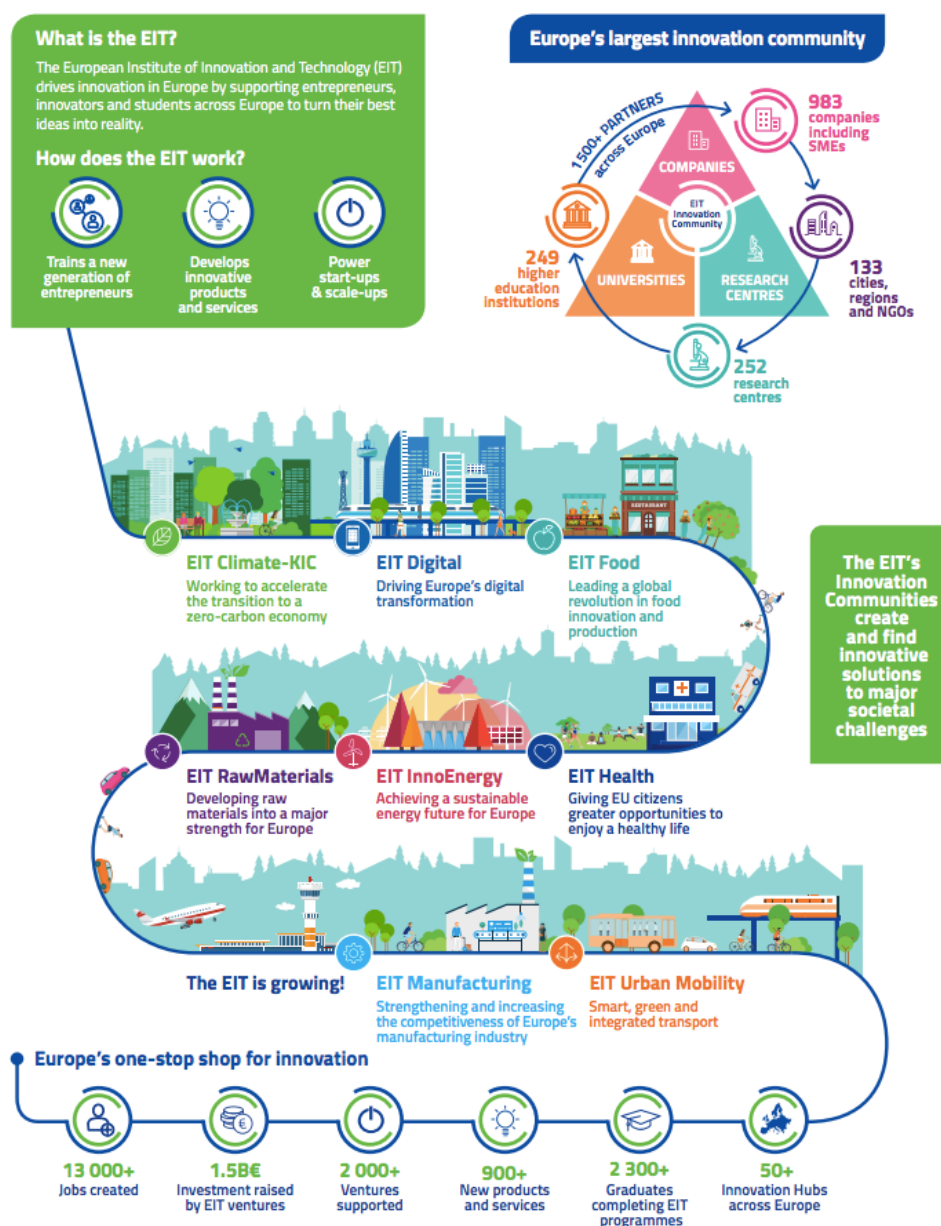


Figure 3. *European Institute of Innovation & Technology Infographic*. Source: EIT (2019)

### **2.1.4 European Research Infrastructures**

The European Research Infrastructures form the pillar of EU competitiveness in science and innovation, accelerating access to new knowledge to tackle the challenges Europe faces. These are key facilities in providing the necessary data and services for European scientists to conduct cutting-edge research in a variety of scientific fields. They also provide an excellent setting for European business to develop new products and services.

The EU has shared investments in Research Infrastructures in the last decades allowing the scientific community to harness the full potential of these infrastructures to deal with complex questions and serve society more effectively.

The *European Strategy Forum on Research Infrastructures* (ESFRI)<sup>46</sup> is a joint meeting composed of national delegates nominated by research ministers of EU countries and countries associated with H2020 and a Commission representative in charge to establish a European Roadmap for Research Infrastructures.

The specific legal form that facilitates the establishment and operation of Research Infrastructures (European joint-venture that also allows the participation of countries from outside Europe) is led by the *European Research Infrastructure Consortium* (ERIC).<sup>47</sup>

### **2.1.5 Europe Open to the World: International Scientific Collaborations**

The EU is a major player in the international science and innovation arena, and leads many areas such as renewable energy and environmental protection. The EU accounts for almost a quarter of global science and technology production in the world.<sup>48</sup>

The main priority of the last international S&T cooperation strategy since 2012 was to foster international cooperation in research and innovation for the EU.

One of the six priorities of the European Commissioner in charge of Innovation, Research, Culture, Education and Youth, Mariya Gabriel is “making Europe stronger in the world”. An update to the international cooperation strategy is currently under preparation as part of the EC communication on an improved ERA.

This new international cooperation strategic approach should also stimulate MS and the EU to ensure responsible global leadership to advance the EU’s values, and to promote and protect Europe’s interest and contribution to solving societal and global challenges. Science Diplomacy in this context plays a key role in addressing complex transnational matters.

In recent years, the EU has signed several international agreements for scientific and technological cooperation with different governments and states. These agreements establish a formal framework for cooperation, and aim to encourage, develop and facilitate activities in the areas of science and technology between the EU and the signing country.

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<sup>46</sup> European Strategy Forum on Research Infrastructures (ESFRI). *Making Science Happen* [website]. [Accessed on 17 June 2020]. Available at: <<https://www.esfri.eu/>>

<sup>47</sup> European Commission. *European Research Infrastructure Consortium (ERIC)* [website]. [Accessed on 17 June 2020]. Available at: <[https://ec.europa.eu/info/research-and-innovation/strategy/european-research-infrastructures/eric\\_en](https://ec.europa.eu/info/research-and-innovation/strategy/european-research-infrastructures/eric_en)>

<sup>48</sup> Elorza A., Lacunza I., & Melchor L. *op.cit. in note 34*. [Accessed on 16 June 2020]. Available at: <<https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>>

The EU is also participating in the *Partnership for Research and Innovation in the Mediterranean Area (PRIMA)*<sup>49</sup> an initiative involving a number of EU countries as well as several countries in the Mediterranean area to build research and innovation capacities and develop knowledge and joint innovative solutions for agro-food and water systems.

### ***2.1.6 Europe 2020 Strategy: Smart, Sustainable and Inclusive***

The decade strategy for smart, sustainable and inclusive growth “Europe 2020” launched in 2010 has prioritized in developing an economy based on knowledge and innovation, promoting a more resource efficient, greener and more competitive economy, and fostering a high-employment labour market delivering economic, social and territorial cohesion through its seven flagships<sup>50</sup>.

*Smart* growth is based on three aspects: education, innovation, and digital society, therefore it requires: improving education’s quality, strengthening research performance, making full use of information and communication technologies (ICTs), and ensuring that innovative ideas turn into quality jobs as well as new products and services. This must be combined with entrepreneurship, finance, and focus on user needs and market opportunities.

EU flagship initiatives related to this topic are:

- *Innovation Union* to improve framework conditions and access to finance for research and innovation to strengthen the innovation chain and boost levels of investment throughout the Union. It also ensures that innovative ideas can be turned into products and services that create growth and jobs.
- *Youth on the move* to enhance the performance of education systems and to reinforce the international attractiveness of Europe’s higher education.
- *A digital agenda for Europe* to speed up the roll-out of high-speed internet and reap the benefits of a digital single market to households and firms.

The actions that the EU has performed during the last decade are: to invest in research and development (R&D), invest in education, training and lifelong learning, and develop a digital society.

*Sustainable* growth is based on climate, energy and mobility, as well competitiveness, meaning: developing new processes and technologies, accelerating the roll out of smart grids using ICTs, exploiting EU-scale networks, and reinforcing the competitive advantages of Small and Medium Enterprises (SMEs) mainly.

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<sup>49</sup> PRIMA. *Partnership for Research and Innovation in the Mediterranean Area* [website]. [Accessed on 17 June 2020]. Available at: <<http://prima-med.org>>

<sup>50</sup> European Commission. *Europe 2020. A strategy for a smart, sustainable and inclusive growth* [online]. 2010. [Accessed on 2 June 2020]. Available at: <<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>>

EU flagship initiatives related to this topic are:

- *Resource efficient Europe* to help decouple economic growth from the use of resources by decarbonising our economy, increasing the use of renewable sources, modernising our transport sector and promoting energy efficiency.
- *An industrial policy for globalisation era* to improve the business environment, especially for SMEs and to support the development of a strong and sustainable industrial base able to compete globally.

During the last decade, Europe has fought to maintain its competitive leadership in the market for green technologies, fight climate change, and widen its reliability on cleaner and more efficient energy sources.

*Inclusive* growth pursues empowering people through high levels of employment, investing in skills, fighting poverty, and modernising labour markets, training and social protection systems.

EU flagship initiatives related to this topic are:

- *An agenda for new skills and jobs* to modernise labour markets by facilitating labour mobility and the development of skills throughout the lifecycle with a view to increase labour participation and better match labour supply and demand.
- *European platform against poverty* to ensure social and territorial cohesion such that the benefits of growth and jobs are widely shared and people experiencing poverty and social exclusion are able to live in dignity and take an active part in society.

In order to achieve these goals, the increase of labour participation and reduction of structural unemployment, the promotion of corporate social responsibility and the implementation flexicurity principles were key elements.



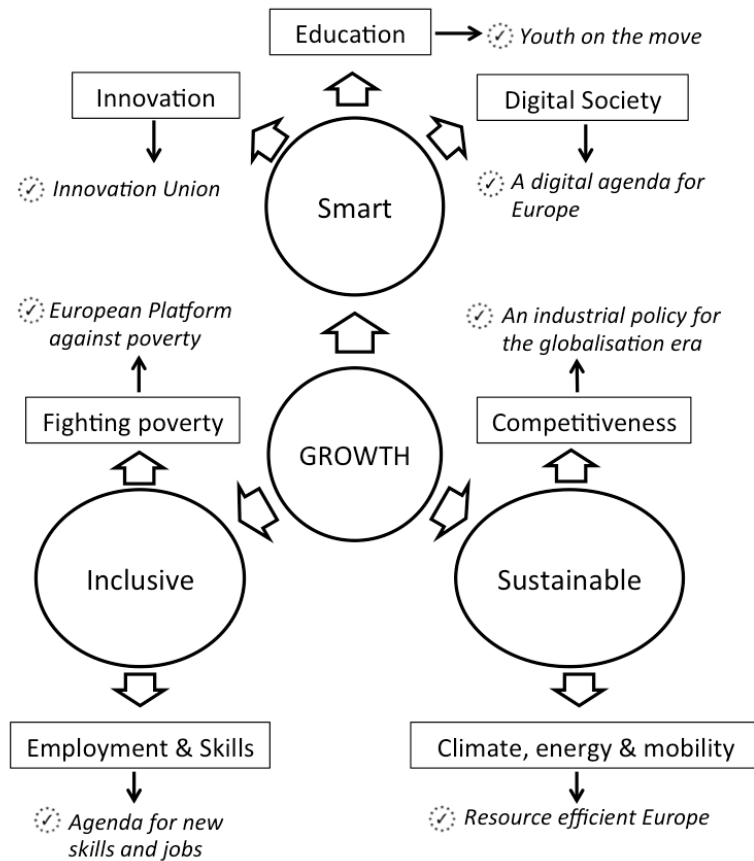


Figure 4. *Europe 2020 dimensions, aspects and flagships*. Source: Prepared by the author

#### a) *Innovation Union Flagship*

The *Innovation Union Flagship Initiative's* ambition is to turn Europe into a world-class performer in science, revolutionise the way the public/private sectors collaborate through innovation partnerships, and create an internal market for skills, patents, venture capital, innovation procurement, and standard-setting to foster and conduct ideas efficiently.

Europe's future is connected to its power to innovate; in the same way the main driver of economic growth is the EU innovation. On the one hand, our continent has world-class researchers, entrepreneurs and companies and it has the unique strength of its shared values, creativity and diversity. On the other hand, our performance in innovation and research needs to be enhanced to master the many challenges ahead and keep our place in a fast changing world.

The central purpose of European social innovation is to tackle the continent's challenges such as: the creation of job opportunities for all, especially for young people; recover a good pace of economic growth, make our enterprises more competitive in the global market, solve the ageing population issues, secure first need resources, fight climate change and improve smart and green transport.

Nevertheless, the EU has important obstacles to wrestle with: weaknesses in public education and innovation systems, poor availability of finance, costly patenting, out-dated regulations and

procedures, slow standard-setting, failure to use public procurement strategically, fragmented and costly duplication efforts among member countries and regions.

The EU must champion social innovation. The regional organisation believes that social innovation is a vital new field that should be nurtured. “It is about tapping into the ingenuity (...) to find new ways of meeting social needs which are not adequately met by the market or the public sector [and/or] bring about the behavioural changes that are needed to tackle the major societal challenges”<sup>51</sup>. However, there has to be a resilient support for these ideas to be tested, evaluated, scaled up and disseminated by infrastructures similar to those for business innovation.

### ***2.1.7 European Social Innovation Perspective***

The European Commission has been fostering social innovation through different unconnected actions and initiatives<sup>52</sup>:

The *Social Innovation Community portal* helps organisations across Europe connect, learn from each other and share experiences.

The *European Social Innovation Competition* is an annual contest to source and support new solutions to societal challenges, and thereby raises awareness about social innovation.

Various funding programmes support directly social innovation such as: SME Instrument of Horizon 2020 open to social enterprises, Employment and Social Innovation Programme, Collective Awareness Platforms, and seed funding through Social Challenges Platform.

To support ecosystem and incubation structures for social innovation. On the one hand, *Social Business Initiative* and the *Start-up & Scale-Up Initiative* builds on the conclusions of an external expert group (GECES) and a mapping of social enterprises’ ecosystems in each of the 28 MS. On the other hand, incubators such as Transition and Benisi are reinforced.

The EC gathers and disseminate evidence about the benefits of social innovation and methodologies for result measurement by periodic publication of impact reports. It also explores for brand new ideas, innovative applications and undiscovered fields for social innovation.

Nevertheless this is not enough so the *New European Social Innovation* launched in 2017 has a vision inspired in three principles<sup>53</sup>:

*Human-centred*: people are simultaneously source and target beneficiaries of innovation. Persons must be at the centre of social innovation strategy, prioritising in their values,

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<sup>51</sup> European Commission. *Europe 2020 Flagship Initiative Innovation Union* [online]. DG for Research and Innovation. 2011. [Accessed on 2 June 2020], DOI: 10.2777/27497, p. 23. Available at: <[https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication-brochure\\_en.pdf](https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication-brochure_en.pdf)>

<sup>52</sup> European Commission. *What the Commission does on social innovation* [website]. Internal Market, Industry, Entrepreneurship and SMEs. [Accessed on 3 June 2020]. Available at: <[https://ec.europa.eu/growth/industry/policy/innovation/social\\_en](https://ec.europa.eu/growth/industry/policy/innovation/social_en)>

<sup>53</sup> Addarii, F., Lipparini, F., *Vision and Trends of Social Innovation for Europe* [online]. European Commission – DG for Research and Innovation. 2017. [Accessed on 3 June 2020], DOI: 10.2777/08700, p. 32-34. Available at: <<https://op.europa.eu/en/publication-detail/-/publication/a97a2fbd-b7da-11e7-837e-01aa75ed71a1>>

investment and involvement by building their capabilities, especially for the most vulnerable ones.

*System focused:* transform people's and institutions' individual potential into positive outputs by operating together in a chain of complex and diverse functions, organised through durable and predictable interactions, building an enabling environment for innovation. The strategic choice of cities and regions as grand scale laboratories, as drivers of the global economy an innovation, as hubs that attract and nurture ideas, talents, capital and organisations.<sup>54</sup> Closer to people's needs than national institutions, cities and regions are big enough to host a meaningful system dynamic and are defined enough to handle this dynamic.

*Politically engaged:* Must be at the core of policy-making and the political agenda of Europe to shape a new social contract for Europe. A renewed vision for social innovation must be firmly anchored in European policy making to address the social dimension of the Union starting with the debate on transformation of the institutional infrastructure and legal basis of welfare systems. Social innovation must be translated into a vision for social progress starting with the definition of the European social contract.

Complementary to the vision and principles, the recommended actions for the EC to turn the vision of social innovation into reality are the following:

- Create a narrative that identifies needs, values, fears, assets, strengths and aspirations of people so that there can be a bottom-up engagement.
- Follow-up the progress and impact measurement, and use this knowledge to achieve a better multi-stakeholder governance by sharing performance management systems.
- Simplify by reducing and easing funding programmes and through the mainstream of participation rules on EU social innovation funding, as to promote an overarching social innovation policy framework.
- Collaborate with the European Investment Bank (EIB), European Investment Fund (EIF) and national banks and investors to establish a 1 billion-outcome payment fund to address current EU societal challenges.
- Establish an EU Social Innovation Agency as a knowledge producer and broker; as an institutional body with the mandate of supporting financial collaborations; as a coordinating, networking and synergy entity; as a convenor for advocacy activities and lobbying initiatives.

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<sup>54</sup> Sassen, S. *Cities in a World Economy* [online]. Sociology for a New Century Series, 269. 2012 [Accessed on 2 June 2020] Available at: <<https://doi.org/10.1007/s13398-014-0173-7.2>>

## 2.2 The STI Diplomacy of the European Union

### 2.2.1 The STI Diplomacy Ecosystem in the European Union

*European External Action Service (EEAS)* is an important diplomatic stakeholder whose mission is to make sure that the EU is a relevant actor in the world, therefore plays a crucial role in deploying the EU science diplomacy strategy worldwide.

Following the Treaty of Lisbon, the EEAS is responsible for the running of EU Delegations and Offices around the world. They are responsible for all policy areas of the relationship between the EU and the host country – be they political, economic, trade, science or on human rights and in building relationships with partners in civil society. (...) They analyse and report on political developments in their host country. They also fund development cooperation through projects and grants. A fundamental aspect of Delegations is their public diplomatic role, which consists of increasing the visibility, awareness and understanding of the EU.<sup>55</sup>

*The Strategic Forum for International Cooperation (SFIC)*<sup>56</sup> is an advisory forum where international scientific cooperation is discussed among the EC, all EU MS and several non-EU countries are seated as observers. The Secretariat is provided by the General Secretariat of the Council of the EU and is chaired by an EU Member State, designated for a period of 2 years.

These are its main tasks:

- Systematically sharing and structuring information on S&T cooperation activities and objectives of the various partners
- Pooling relevant knowledge concerning third countries, in particular analyses of their S&T resources and capabilities
- Ensuring regular consultation between partners in order to identify their respective objectives and common priorities in terms of S&T cooperation with third countries
- Where appropriate, coordinating activities of a similar nature are implemented by MS and the EU
- If necessary, proposing initiatives to be implemented with appropriate processes
- Networking of MS and the Commission's scientific advisors in key third countries

SFIC is playing a very crucial role in discussing how EU science diplomacy could be advanced with targeted actions and improved coordination. In fact, SFIC established a Task Force on Science Diplomacy from 2019 to 2021. In early 2020, an input paper was adopted on Science Diplomacy, entitled “Advancing the impact of Science Diplomacy at EU and Member States level through targeted support and improved coordination”<sup>57</sup>.

Among the motivation to foster European Science Diplomacy, this paper highlights:

- Making Europe stronger in the world

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<sup>55</sup> Elorza A., Lacunza I., & Melchor L. *op.cit. in note 34*. [Accessed on 16 June 2020]. Available at: <<https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>>

<sup>56</sup> European Commission. *Strategic Forum for International Cooperation* [website]. [Accessed on 17 June 2020]. Available at: <<https://ec.europa.eu/research/iscp/index.cfm?pg=sfic-general>>

<sup>57</sup> SFIC. *Input paper by the SFIC Science Diplomacy Task Force* [online]. ERAC-SFIC 1352/20, 2020. [Accessed on 18 June 2020]. Available on: <https://data.consilium.europa.eu/doc/document/ST-1352-2020-INIT/en/pdf>

- Great capital for EU: science diplomacy is not fully exploited
- EU Science diplomacy approach with new actors beyond the governmental level
- SDGs: addressing complex transnational matters

Also, among the SFIC proposals, it is worth mentioning the following:

- Inclusion of Science Diplomacy in the new EU STI International Cooperation Strategy
- Creation of a EU Platform for Science Diplomacy
- Supporting the development of training activities in the area of Science Diplomacy/ Science Advice as well as the creation of Science Diplomacy networks
- Development of an overall Science Diplomacy Roadmap including the EU Commission, the EEAS and the Member States
- Organisation of an Annual European Science Diplomacy Conference including a European Science Diplomacy Award
- Foster the integration of Science Diplomacy aspects in national STI strategies

*Scientific Advice Mechanism (SAM)*<sup>58</sup> to the European Commission was established in 2015 and has the mandate to give independent high quality, timely scientific advice to the EC from a variety of complex challenges so that policy making and legislation can be better informed with scientific evidence. Although SAM's mandate goes beyond the science diplomacy realm, science advice to diplomacy and foreign affairs is a fundamental dimension of this type of public diplomacy.

SAM is composed of seven chief scientific advisors (who are independent, appointed in their personal capacity and serving the public interest), the Scientific Advice for Policy by European Academies (SAPEA) consortium (which gathers expertise in engineering, humanities, medicine, natural and social sciences from over 100 academies and societies across Europe), and a secretariat in the Commission's research and innovation department.

*EURAXESS*<sup>59</sup> is a pan-European initiative delivering information and support services to researchers and supports the ERA, which as stated before, enables free circulation of researchers, scientific knowledge and technology. Backed by the EU, MS and Associated countries, it supports researchers' mobility and career development, while enhancing scientific collaboration between Europe and the world.

The service has the modality *EURAXESS worldwide* which has dedicated teams in Asia, Latin and North America, offering the chance to interact on a global scale and it is a networking tool to support researchers working outside Europe who wish to connect or stay connected with Europe and who are potentially valuable assets for the European science diplomacy.

The other two stakeholders that are part of the EU Science Diplomacy ecosystem but that have already been explained in the previous section dedicated to the "European Scientific and

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<sup>58</sup> European Commission. *Infographic: How the Scientific Advice Mechanism works* [online]. [Accessed on 18 June 2020]. Available at: <[https://ec.europa.eu/info/publications/infographic-how-scientific-advice-mechanism-works\\_en](https://ec.europa.eu/info/publications/infographic-how-scientific-advice-mechanism-works_en)>

<sup>59</sup> European Commission. *EURAXESS* [website]. [Accessed on 18 June 2020]. Available at: <<https://euraxess.ec.europa.eu/>>

Innovation Organisations” and are the *Directorate General for Research and Innovation (DG RTD)* and the *European Commission Joint Research Centre (JRC)*.

### ***2.2.2 The Member States in the European STI Diplomacy Ecosystem***

European science diplomacy needs to be understood in a multi-level governance framework in which Member States hold and share responsibilities and where, some of them have taken the lead in developing science diplomacy strategies.

A number of member states have science and technology advisory boards or science advice structures to inform governments (that function as SAM for the EC). These boards can take many forms and those boards advising foreign affairs policies are a classic example of science diplomacy.

Additionally, a number of MS have science and technology counsellors, attachés or advisers not only in third countries but also among themselves, as scientific cooperation within the EU, which is extremely fruitful.

Some of the most relevant European universities and research performing organisations have either liaison offices in other Member States and third countries if not joint centres where scientific cooperation is key.

### ***2.2.3 The Vision of the EU STI Diplomacy inherited from Moedas***

In the last years, the European Commission has strongly embraced science diplomacy as a fundamental tool of external relations. Although the EU has been engaged in international scientific cooperation since the first research and development framework programme in 1984, it is around 2016 when both the European External Action Service and the General Directorate for Research and Innovation started identifying science as a fundamental asset for Europe’s foreign policy<sup>60</sup>.

One of the most relevant champions of current European science diplomacy at the executive level has been Carlos Moedas, former Commissioner for research, science and innovation. As part as a wider policy framework, *the EU as a stronger global actor*<sup>61</sup>, Moedas envisioned science diplomacy as a crucial means to foster international cooperation in global challenges and to use the universal language of science as a way to reach a common understanding in those problems that are often highly politicized and culturally sensitive.

In his vision, science diplomacy played a crucial role in post second world war Europe (with prominent examples such as the construction of the European Organization for Nuclear Research [CERN]). In addition, the values and commitment to scientific endeavour enshrined at the EU guiding treaties prove how science is at the core of the integration process. In contemporary Europe, European research is an important resource for exercising the EU’s collective responsibility in a spirit of international solidarity, as part of its efforts to work with international partners to solve common and complex global challenges<sup>62</sup>.

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<sup>60</sup> De San Román A., Schunz S. *Understanding European Union Science Diplomacy* [online]. Journal of Common Market Studies, 56(2), 2017. pp. 247-266. [Accessed on 19 June 2020]. Available on: <<https://doi.org/10.1111/jcms.12582>>

<sup>61</sup> European Commission. *The EU as a stronger global actor. Towards a more united, stronger and more democratic union* [online]. DOI:10.2775/98393. 2019. [Accessed on 19 June 2020]. Available at: <<https://ec.europa.eu/commission/sites/beta-political/files/euco-sibiu-stronger-global-actor.pdf>>

<sup>62</sup> Moedas, C. *Science Diplomacy in the European Union* [online], Science & Diplomacy, 5(1) 2016. [Accessed

This science diplomacy approach to EU research and innovation was substantiated in the last of the three policy goals that have guided Moedas' mandate: Open Science, Open Innovation, and Open to the World<sup>63</sup>

*Open Innovation*: in spite of the EU being a research powerhouse, Europe very rarely succeeds in turning research into innovation, in getting research results to market. This is where the open innovation concept comes into play: opening up the innovation process to all active players so that knowledge can circulate more freely and be transformed into products and services that create new markets, fostering a stronger culture of entrepreneurship.

*Open Science*: it represents a new approach to the scientific process based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools. The idea captures a systemic change to the way science and research have been carried out for the last fifty years: shifting from the standard practices of publishing research results in scientific publications towards sharing and using all available knowledge at an earlier stage in the research process.

*Open to the world*: it means striving to ensure that EU research and innovation can work at a global level for all of us. Whether mobilising EU funding for a rapid and effective global research response to outbreaks like Coronavirus or Zika; contributing to the evidence base for the International Panel on Climate Change and COP21 negotiations as over a thousand results from EU-funded research projects have done; benchmarking innovative European solutions for green urban mobility in Latin America, or promoting scientific cooperation in the Middle East through the SESAME project. In other words, it means science diplomacy.

In order to explore how this vision could be implemented long term, the Commissioner for Research, Science and Innovation set up the *Research, Innovation and Science Expert group* (RISE). The RISE report clearly identifies an opportunity to increase the European Union's influence in the current nature of the challenges of the 21st Century.<sup>64</sup> It identifies, however, three major challenges:

- How to carve out a specific role for the EU that complements the Science Diplomacy policies of its Member States
- How to draw together the scientific resources of the EU in support of the EU's various externally facing policies, such as trade or development
- How to integrate that role in the overall EU's Global Strategy for Foreign and Security Policy driven by EEAS.

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on 19 June 2020]. Available at: <<http://www.sciencediplomacy.org/perspective/2016/science-diplomacy-in-european-union>>

<sup>63</sup> Moedas, C. *A new start for Europe: Opening up to an ERA of Innovation* [online]. 2015. [Accessed on 19 June 2020]. Available at: <[https://ec.europa.eu/commission/presscorner/detail/de/SPEECH\\_15\\_5243](https://ec.europa.eu/commission/presscorner/detail/de/SPEECH_15_5243)>

<sup>64</sup> European Commission. *Europe's Future: Open Innovation, Open Science, Open to the World. Reflections of the Research, Innovation and Science Policy Experts (RISE) High Level Group* [online]. Directorate-General for Research and Innovation. DOI:10.2777/514910. [Accessed on 19 June 2020]. Available at: <<https://op.europa.eu/en/publication-detail/-/publication/15e2ff8d-c525-11e8-9424-01aa75ed71a1>>

Among their recommendations for the development of EU science diplomacy, the S4D4C project highlights the following<sup>65</sup>:

- The need to build capacity to give and receive science advice
- Better coordination between the EC and EEAS that would enable more active exploitation of the science-based assets of EU soft power in relation to other countries and other regions of the world
- The EC acting as a pioneer of S&T on the international stage by establishing strategic S&T bilateral agreements and high-level policy dialogues at the country and regional levels in the context of a Global Research Area

A new institutional perspective on EU science diplomacy is still in the development phase by the present Commissioner on the matter, Mariya Gabriel, and the High Representative of the European Union, Josep Borrell.

#### ***2.2.4 The Implementation of the EU STI Diplomacy***

An overview of the current practical development of science diplomacy in the EU will be explained through this section. The EU is a complex multi-governance, supranational structure that adds diversity yet complexity to its policies. The EU science diplomacy cannot be understood without considering the role of member states.

Policy coordination in the EU ranges from strong integration on a supranational level to purely intergovernmental approaches. Both science and foreign policies could be understood as stable multilevel governance approaches at the EU level (with the EU, member states, and regions having their own competences) with clearly defined responsibilities and jurisdictions<sup>66</sup>.

The European Commission has taken the lead in a number of very important issues related to science policy like boosting the 7<sup>th</sup> Research and Development Framework programme budget, launching the European Research Council or establishing coordination mechanisms with Member States. However, member states still hold authority when it comes to their own research and innovation programmes.

In the same way, the High Representative for Foreign Affairs and Security Policy and the EEAS do not replace or rule national foreign offices and services. Again, the functioning of the service, with most staff from national foreign ministries, illustrates the multilevel governance framework of the EU. In fact, this coexistence of MS' and the EU's foreign policy has been questioned as European diplomacy only attends topics of lesser importance or delicacy<sup>67</sup>.

Because of science diplomacy being at the intersection of science and foreign policies, there is general agreement that it has to be seen as a shared responsibility among the EU and Member States<sup>68</sup>. However, EU science diplomacy would not fit into the scheme of clearly delineated,

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<sup>65</sup> Elorza A., Lacunza I., & Melchor L. *op.cit. in note 34*. [Accessed on 19 June 2020]. Available at: <https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>

<sup>66</sup> Rüffin, N. *EU Science Diplomacy in a Contested Space of Multi-Level Governance. Ambitions, Constraints and Options for Action. Research Policy*, [Accessed on 20 June 2020]. 2019. Available at: <http://dx.doi.org/10.1016/j.respol.2019.103842>

<sup>67</sup> Ibidem.

<sup>68</sup> Van Langenhoven, L. *Tools for an EU Science Diplomacy* [online]. European Commission. DG for Research



defined, jurisdictions (as it is the case for science and foreign policy)<sup>69</sup>. This means European science diplomacy would touch upon a number of jurisdictions, including all communities who aim at using the term for their own purposes. In other words, science diplomacy would be better understood as a fluid concept that needs to be amended according to individual cases.<sup>70</sup>

It is in this context where EU Science Diplomacy needs to find its place and much research and collective reflection is being done in order to try to come up with a coherent strategy for the EU.

### *2.2.5 Experts' remarks about the EU STI Diplomacy*

Three very concrete challenges for the EU science diplomacy are identified<sup>71</sup>:

- Understanding of science diplomacy as a fluid concept as a first step to structure its governance framework that need to contain (at least) three elements: the governance arrangements, the actors' landscape, and the facto practices.
- Coordination needed among MS and the EC. Some practitioners describe a competitive scenario sometimes where EU and MS representatives in third countries operate in competition to one another.
- Capacity building and recruiting of science diplomats. Science diplomacy calls for better skills training of current and future professionals at the intersection of science and foreign policy.

From another perspective, some other authors reflect on how the EC needs to find its added value over the science diplomacy strategies of MS. For example, a joint approach by the Commission and Member States would prevent third countries from free-riding and cherry picking a preferred mode of collaboration, which is a situation that many interview partners find alarming at present.<sup>72</sup>

Moreover, smaller MS could benefit from the EU acting as a door-opener in S&T negotiations with emerging science powers. In any case, a new independent EC science diplomacy must accommodate for the largely diverging agendas, claims, and resources of Member States.<sup>73</sup>

The EU's motivations for developing its science diplomacy can be seen from two possibilities. On the one hand, one of the motivations would be the EU aiming to be considered as a "normative power", where the EU external science activities would be motivated by the desire to promote its norms and values in its attempts at co-operating with third countries. On the other hand, another motivation (not necessarily incompatible) would be the EU aiming to be considered as a "market power": a large regulated market that wants other actors to adhere to

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and Innovation. DOI:10.2777/911223. 2017. [Accessed on 20 June 2020]. Available at: <<https://op.europa.eu/en/publication-detail/-/publication/e668f8cf-e395-11e6-ad7c-01aa75ed71a1>>

<sup>69</sup> Rüffin, N. *op. cit.* in note 66. [Accessed on 20 June 2020]. 2019.

<sup>70</sup> Flink, T., Rungius C. *Science Diplomacy in the European Union: Practices and Prospects* [online]. S4D4C Policy Brief 1, 2018. [Accessed on 20 June 2020]. Available at: <<https://www.s4d4c.eu/wp-content/uploads/2018/11/S4D4C-Policy-brief-Flink-and-Rungius-2018-Science-Diplomacy-in-the-European-Union.pdf>>

<sup>71</sup> *Ibidem.*

<sup>72</sup> Elorza A., Lacunza I., & Melchor L. *op.cit.* in note 4. [Accessed on 19 June 2020].

<sup>73</sup> Rüffin, N. *op. cit.* in note 66. [Accessed on 20 June 2020]. 2019.

levels of regulation similar to its own or to behave in ways that generally satisfy EU policies and regulations. The Union clearly seems to qualify at the same time as market and normative power in the external science policy domain.<sup>74</sup>

a) *European Innovation Diplomacy. Scenarios and Policy approaches*

One of the key issues for international relations is that technological power (and therefore the related social, political and economic power) is not evenly distributed around the globe. Such powers are concentrated in innovation ecosystems, hubs, clusters or megaregions. The combination of networked technologies and data leads at the same time to a stronger concentration of powers and to a deeper penetration of these powers into economic, social, and political life. In many countries, this is a reason for putting technology higher on the political agenda. Nevertheless, when this happens, we can also observe great differences in the way national policies want to regulate technology-based power. Even in the single European market, we can see major differences in the ways in which global shared companies are regulated. The regulatory differences may become even bigger when so-called ethical issues start to play a role. These developments contribute to the growth of an international field of negotiated collaboration or, in some cases, outright competition or power struggles.

Jos Leijten observes that Europe lacks a consistent future-oriented policy view to guide its international policies.<sup>75</sup> This is particularly problematic for innovation related issues and policies, because in this case the division of labour between Commission and Member States is unclear. In general, trade and commercial policies, which are highly relevant for innovation, are in the hands of the EC. Many other relevant policy areas, such as environment, transport and energy, are shared competences primarily in the hands of the EU. Foreign policies, security and research are also shared, but primarily in the hands of the MS. Industry and education are fully in the hands of the MS. Science, but even more so, technology and innovation have strong linkages to all these policy areas. Europe urgently needs a vision about its international science, technology and innovation policy position, to align with the Member States (not to mention the stakeholders), to clarify the division of labour and to guide the international activities from EC and MS.

Therefore, the three possible scenarios for Europe in innovation diplomacy according to Leijten are:

The first one would be the rising of *populism and protectionism* that would not enable innovation diffusion to occur.

The second scenario would be innovation as a *global public good*, which originates from the Open Science, Innovation and to the World Moedas approach, and splits into two perspectives:

- Innovation built on *knowledge*, which is largely public and global. It is the basis for companies to build the global value chains that deliver the global diffusion of innovations.

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<sup>74</sup> De San Román A., Schunz S. *op.cit.*, in note 60 [Accessed on 20 June 2020].

<sup>75</sup> Leijten, J. *Science, technology and innovation diplomacy: a way forward for Europe*. EL-CSID Project – Institute for European Studies (IES). 2019. [Accessed on 16 June 2020]. Available at: <<https://www.ies.be/node/4930>>

- Development of innovations is needed *to solve global problems*. International collaboration is needed to build the necessary knowledge, develop technologies and realise these innovations.

There are sufficient tendencies in different countries or world regions to make this vision a viable force, which can have considerable influence on the spread of innovations and related growth around the world.

The third scenario would be *bottom-up innovation*. The strength of networking externalities and the resulting push for globalisation in many of the new technologies of today and the foreseeable future is becoming a dominant societal force. Sectors are dominated by a small number of large firms with a global reach. To preserve their monopolies or oligopolies these firms make considerable efforts to influence politics. They have their private diplomatic services (public affairs).

Another tendency that shapes this scenario is the growth of user driven innovations in sustainable development, urban development, (self-) employment and other fields, that will become very strong forces for change. Social networking allows global linkage and mutual strengthening of these initiatives.

Moreover, this last scenario recognises that local politics are better than national government in picking up these initiatives and at incorporating them into their local policies. The vision that is behind this, as expressed in concepts like clusters and innovation eco-systems, may turn a local government into a global actor, by facilitating the exchange of experiences with similar initiatives around the world or by facilitating connections with regions, which contribute to vital parts of the local value network. This brings local and regional governments into the domain of international relations, economic and innovation diplomacy.

The role of a national government within the bottom-up innovation scenario is mostly one of following and then supporting the local societal tendencies and strengthening the key actors.

The four recommended policy approaches by Leijten for STI European diplomacy would be as a starting point to continue the *Open Europe* perspective of innovation as a global public good. Then create a *global level playing field*, including free trade, free exchange of knowledge and of innovative products and services contemplating reciprocity and justification in the regulation of transfers

In the third place identify and increase awareness of Europe's technological and related business strengths and in how far such strengths are critical for the functioning of Europe's economy and society. Europe represents a large and wealthy market that has a strong and innovative industry, which delivers high quality products and services, and it has several strong innovation eco-systems. Fostering such strengths and critical technologies is necessary to maintain a strong negotiating position in a world in which a major player like the US is moving toward a transactional approach to international relations. The actual policies may be both defensive as well as offensive. The intention of this third policy approach is to add a position of power to Europe's international relations and negotiations in the field of innovation.

And finally to identify and spread the key social values and goals that Europe wants to pursue in its internal and external innovation policies such as sustainability, quality of life, etc.

Because of innovation, science has also changed into an issue in the competitive relations between nations. Is it possible and useful to distinguish between science diplomacy and innovation diplomacy? In the case of innovation diplomacy, the diplomatic activities are clearly there to push STI forward, either in the national interest or in the international interest if the perspective of *global public good* is considered. It is *diplomacy for science*.

However, what can science do for diplomacy? In line with this perspective Paul Arthur Berkman stresses the independent role of science and scientists: “Science is a neutral platform that allows for less politically charged dialogues, which in turn create bridges that help overall diplomatic efforts.”<sup>76</sup>

### ***2.2.6 The EU Science Diplomacy Cluster***

The European Union is defining its strategy for regional science diplomacy. Three complementary projects – El-CSID, InsSciDE, and S4D4C – funded by H2020 are forming the first EU science diplomacy cluster.<sup>77</sup>

Through multidisciplinary research and dialogue, all three projects generate frameworks for governance, strategic advice, training modules for diplomats and scientists, and ground-breaking knowledge on science diplomacy histories and case studies. Researchers and practitioners from the three projects are in constant dialogue and exchange of ideas and results.

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<sup>76</sup> Berkman, P.A. *Could Science Diplomacy be the key to stabilizing international relations?* [online]. The Conversation. 2018. [Accessed on 16 June 2020]. Available at: <<https://theconversation.com/could-science-diplomacy-be-the-key-to-stabilizing-international-relations-87836>>

<sup>77</sup> Science Diplomacy [website]. [Accessed on 20 June 2020]. Available at: <<https://www.science-diplomacy.eu>>

### 3. SWEDEN'S INNOVATION PERFORMANCE

#### 3.1 The Swedish Innovation Strategy 2020

Innovation is intrinsically linked to sustainable development; it is the driving force to make improvements in living standards, consequently affects positively to individuals, has an impact on the environment, and influences significantly in the global economy as well.

The vision of Sweden is a creative country characterised by pioneering ideas and new ways of thinking and doing in order to shape its future in a global community. Swedish citizens are willing to contribute for a better society, economy and environment through new or improved solutions.

The goal of the Swedish Innovation Strategy (SIS) launched by the Ministry of Enterprise, Energy and Communications in 2012 (now the Ministry of Enterprise and Innovation) is to learn from other countries' work with developing the innovation policy and be a source of inspiration globally by means of a long-term and coordinated work to strengthen the innovation climate.

Sweden needs to contribute to innovative and sustainable solutions to global societal challenges. (...) Innovation policy work is particularly important for Sweden as a trade-oriented country with no major market of its own.<sup>78</sup>

Sweden's government recognises that innovation arises from the creativity and power of initiative of individuals, starting from the inventor who has the idea, passing to consumers who have demands, entrepreneurs who materialise the creativeness, salespersons who communicate the ideas efficiently and the financiers who invest in the project and provide expertise for the market.

The power of innovation can turn knowledge, expertise and ideas into new solutions in order to meet needs and demands. The factors that affect the power of innovation are<sup>79</sup>:

- Demands and markets.
- Incentives for investments in knowledge and entrepreneurial activity.
- Specialised resources for the development of technology, methods, organisation or processes.
- The knowledge and competence base for innovation that is developed through research, education or independent learning.
- Rules and regulations, organisational forms and communication between actors in innovation processes: businesses, the public sector, academia, civil society and individuals.

Sweden has worked in developing a world-class innovation climate with a view to 2020. The strategy has been based on three main principles with its corresponding targets and sub-targets:

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<sup>78</sup> Swedish Ministry of Enterprise, Energy and Communications. *The Swedish Innovation Strategy* [online]. 2014 p. 7 [Accessed on 3 June 2020]. Available at: <<https://www.government.se/information-material/2012/10/the-swedish-innovation-strategy/>>

<sup>79</sup> *Ibidem*, p.10.

The best possible conditions for innovation:

*Innovative people:* who have the capacity (knowledge, skills and expertise), willingness (from different roles: entrepreneur, manager, employee, user and citizen) and conditions (attractive working-life conditions) to contribute to innovation.

*High-quality research and higher education for innovation:* top quality and relevant research and education in universities; research institutes that meet knowledge and development needs in business and society; strong Swedish research nodes with solid positions in global knowledge networks.

*Framework conditions and infrastructures for innovation:* that lays the foundation for a robust innovation climate; regulations, market conditions and norms that promote innovation; functioning access to competent capital that promoted businesses' capacity for innovation and growth; sustainable physical and digital communication that promote innovation.

People, businesses and organisations that work systematically with innovation:

*Innovative businesses and organisations:* which grow by offering innovative solutions on global markets using the potential in social innovation and social entrepreneurship to contribute in meeting societal challenges.

*Innovation in the public sector:* innovative and collaborative public service organisations that are legally secure and effective and have a high degree of quality, service and availability; work systematically with innovation in order to increase efficiency and quality: contribute to developing innovative ways of meeting societal challenges; efficient public sector support for innovation with a focus on customer benefit.

*Innovative regions and environments:* that have international appeal; increase their innovation capacity based on their unique conditions; regional strategies for innovation are grounded in combined regional leadership.

Implementation of the strategy based on a holistic view

*In developed coordination between areas and policy levels:* the creation of functioning venues for dialogue and coordination between different areas as well as between local, regional, national and international levels.

*In dialogue with actors in industry, the public sector and civil society:* that have important roles in supporting Sweden's innovation capacity. A shared understanding of challenges and opportunities as a basis for initiatives is therefore needed.

*In a process of continuous learning:* policy grounded in available evidence, utilising lessons learnt and good examples; objectives that are possible to monitor over time, as well as good analyses for well-founded priorities are needed.

The SIS is a sustainable work to keep and further develop Sweden's leading position in terms of innovation climate and capacity to meet global societal challenges, increase the competitiveness and renew the future welfare and public services.

### 3.2 Sweden's involvement in H2020

Sweden's participation in the FP Horizon 2020 is good but not remarkable as it occupies the 9<sup>th</sup> place in the participation rank and the 8<sup>th</sup> in budget share rank out of the 28 member states. The number of Swedish organisations involved in H2020 projects represents 3,36%; similarly, the funding received by the project's participants is of 3,76% out of the EU total.<sup>80</sup>

Depending on the thematic priority, Swedish beneficiaries of H2020 are involved in Marie-Sklodowska-Curie Action (757), Smart, green and integrated transport (510), Health, demographic change and wellbeing (381), ICTs (372), and Secure, clean and efficient energy (323).

If we analyse the participation according within its regions, Stockholms län is by far the most participative one with 1468 organisations involved, followed by Västra Götalands län (892), Skåne län (471), Uppsala län (384), and Östergötlands län (277).

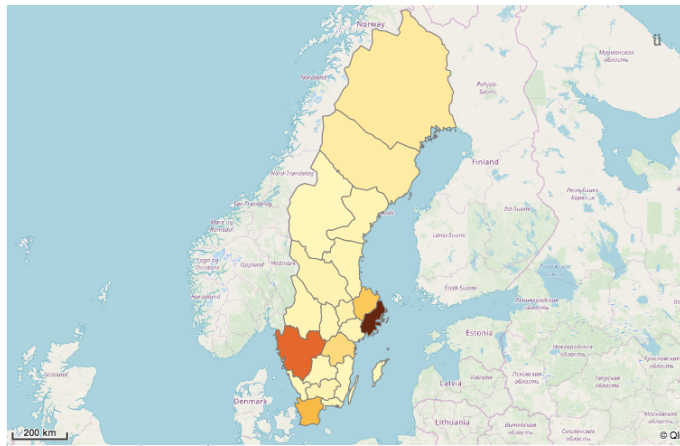


Figure 5. Sweden H2020 Participation by Regions. Source: European Commission

More than half of the participating organisations belong to the higher or secondary education sector, actually the top 5 Swedish organisations that have received the most significant EU contributions are universities: Karolinska Institutet (154,61M€) Lunds Universitet, (151,89M€), Kungliga Tekniska Högskolan (137,61M€), Chalmers Tekniska Högskola AB (137,32M€) and Uppsala Universitet (126,87M€).

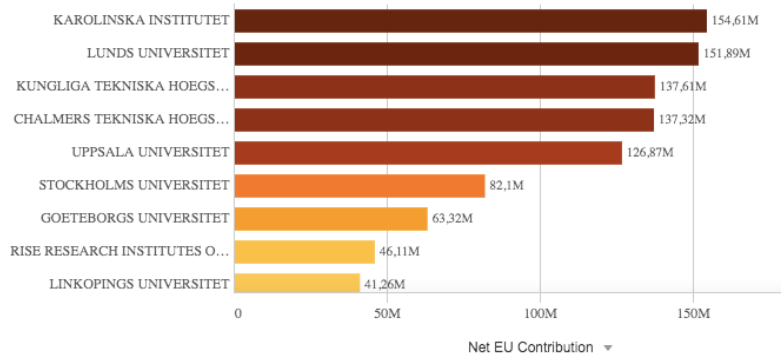


Figure 6. Sweden's H2020 Top Organisations. Source: European Commission

<sup>80</sup> European Commission. *H2020 Country Profile* [application]. [Accessed on 24 June 2020]. Available at: <https://webgate.ec.europa.eu/dashboard/extensions/CountryProfile/CountryProfile.html?Country=Sweden>

In relation to the collaboration links with other countries, Sweden has partnership with Germany in 9.867 projects, then has large number of projects with Spain (7.545), followed by France with 7.345 projects, next Italy with 6.715, and afterward with the UK (6.421).

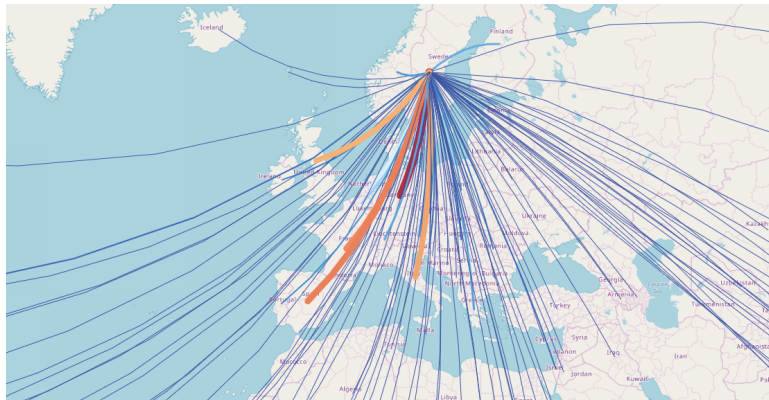


Figure 7. Sweden's H2020 Intl. Collaboration map. Source: European Commission

### ***3.2.1 RIO – H2020 Policy Support Facility Recommendations for Sweden***

The Research and Innovation Observatory (RIO) monitors and analyses research and innovation developments at country's and EU levels to support better policy making in Europe.

The Horizon 2020 Policy Support Facility (PSF) offers practical support to Member States and Associated Countries to design, implement and evaluate reforms that enhance the quality of their research and innovation investments, policies and systems.

The RIO-PSF website is a reference and key source of information for European and national policy makers as well as other stakeholders in the field of R&I policy. It delivers analysis, insights, statistical data and best practices on designing, implementing and evaluating research and innovation policy at EU and national levels.

To have an idea of the public advice the RIO-PSF publishes, the most updated recommendations for Sweden at the time this research was done were the following:

Sweden's short-term policy response to COVID-19 outbreak relies on securing appropriate resources and capacity buffers and adapting the roles and responsibilities of health workers. (...) Making use of Sweden's strong R&I sector for science-driven actions can contribute to progress on vaccines development, treatments and diagnostics and on translating research findings into public health policy.

Supporting the availability of skills, and digital skills in particular, can sustain higher productivity growth through research and innovation in high-tech sectors, and help achieve Sweden's ambitious climate and energy objectives contained in its National Energy and Climate Plan. (...)

To foster the economic recovery, it will be important to front-load mature public investment projects and promote private investment, including through relevant reforms. In the digital and microelectronics sectors, more than 50% of employers report skills shortages affecting growth. Sustaining the high share of public spending in research is a necessary condition to improve the productivity performance. Capital deepening and higher investments in high-tech and innovative sectors are also needed to restore labour productivity growth. The diffusion of new digital technologies among small and medium-sized enterprises will help boost productivity. (...) The objective of achieving a climate neutral society in 2045



will also require investments in research and innovation enabling the development and implementation of novel, competitive solutions for decarbonisation and coordinated social and policy actions. (...) <sup>81</sup>

### 3.3 Sweden vs. EU28 in Europe 2020 Headline Indicators Scoreboard

The five headline targets, which have been assessed through updated Eurostat indicators for EU28 and its results at European and Swedish level are <sup>82</sup>:

Headline targets	EU28	Sweden
<i>Invest 3% of GDP in R&amp;D and develop a new indicator to track innovation.</i>	The last data published is of 2,12% (2018), far from achieving it.	Reached the 3,32% in R&D investment in 2018, but its individual goal was 4% for 2020.
<i>Reduce school drops to 10% and increase up to 40% adults in their early 30's who have completed college or university degrees.</i>	The most recent results from 2019 are respectively: 10,3% early leavers, almost accomplished and 41,6% of adults graduated, goal overtaken.	Its own target was under 7% of early leavers and they reduced it down to 6,5% in 2019.  As the tertiary educational attainment, Swedish goal was 45% and its last outcome was 52,5%, excellent results.
<i>Reduce at least 20-30% of greenhouse gas emissions (GHG), and increase in 20% the share of renewable energy as of energy efficiency.</i>	Great results in the first one: - 21,66% (2017).  Near the target of the second one: 17,97% (2018)	In 2017 they reported -23,68% GHG respect 1990.  Its share of renewable energy was 54,6% in 2018, exceeded its own objective of 49% and its by far the best performance in the EU.
<i>Raise the employment rate to at least 75%.</i>	Results very close to the objective: 73,9% (2019)	Surpassed it with 82,1% in 2019, as its own target of 80%, becoming the highest rate in the EU.
<i>Reduce poverty lifting 20 million people out of poverty.</i>	-7521 in 2018. Very far from the target	293 more than in 2008. The only negative outcome.

Table 1. *Europe 2020 Strategy Headline Targets and Results.* Source: Prepared by the author

In the upcoming reflection on a possible future strategy, the EU's and Member States' commitment to the UN 2030 Agenda and its Sustainable Development Goals (SDGs), the European Pillar of Social Rights proclaimed by the European Parliament, the Council and the Commission at the Gothenburg Social Summit of 17 November 2017, as well as the European Council's new strategic agenda for the EU for the period 2019-2024 can also provide inspiration to help shape a future strategy. <sup>83</sup>

<sup>81</sup>European Commission. *2020 Country Specific Recommendations. Research and Innovation analysis* [online]. DG for Research and Innovation, p. 33. [Accessed on 4 June 2020]. Available at: <[https://rio.jrc.ec.europa.eu/sites/default/files/report/2020\\_Compndium\\_CSRS\\_Communication.pdf](https://rio.jrc.ec.europa.eu/sites/default/files/report/2020_Compndium_CSRS_Communication.pdf)>

<sup>82</sup>EUROSTAT. *Europe 2020. Headline Indicators: Scoreboard* [online]. [Accessed on 1 June 2020]. Available at: <<https://ec.europa.eu/eurostat/web/europe-2020-indicators/europe-2020-strategy/headline-indicators-scoreboard>>

<sup>83</sup>European Commission. *Assessment of the Europe 2020 Strategy* [online]. DG for Employment, Social Affairs and Inclusion. 2019, p. 109. [Accessed on 1 June 2020]. Available at: <<https://op.europa.eu/es/publication-detail/-/publication/9c2013d6-01f3-11ea-8c1f-01aa75ed71a1>>

### 3.4 Sweden's position in the European Innovation Scoreboard (EIS)

The European Innovation Scoreboard (EIS) 2020<sup>84</sup> is one of the basic instruments for evaluating the Innovation Union and also works as a type of European countries' ranking on innovation that tracks a broad range of indicators to get a clear picture of how the Member States are doing when it comes to maximising their innovation potential and in the end the Union's performance.

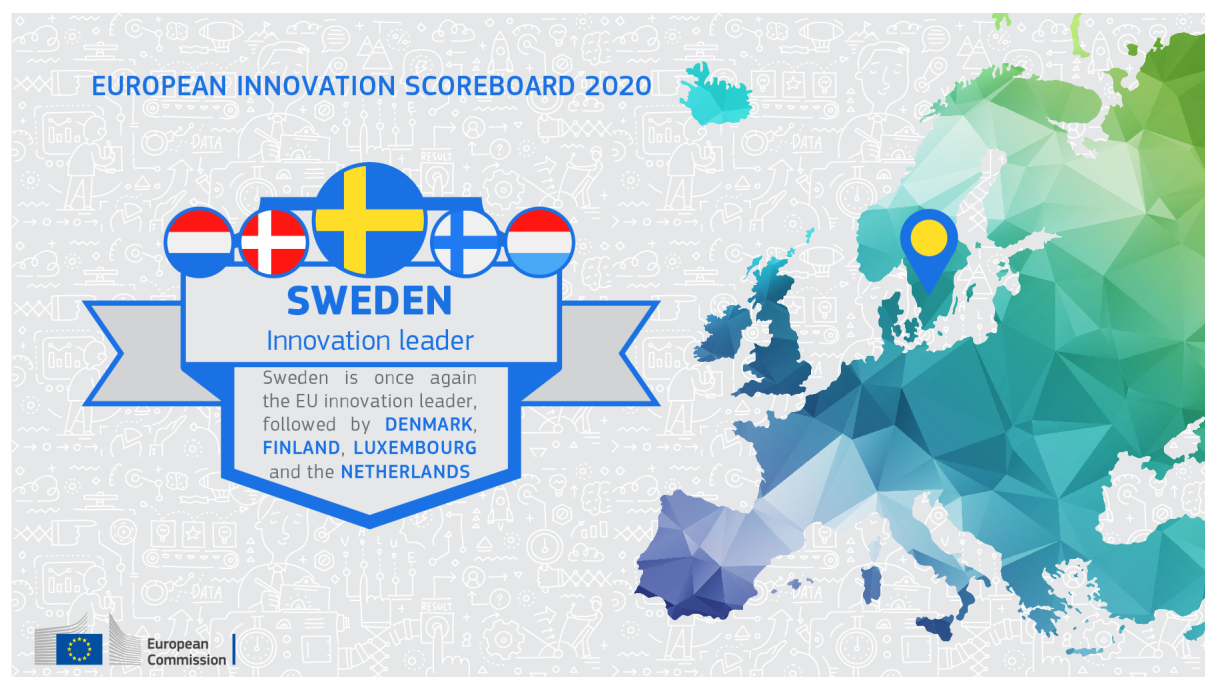


Figure 8. *European Innovation Scoreboard 2020 cover* Source: European Commission

This year, Sweden obtained the first place of EU's Innovation Scoreboard and last year for the first time the EU surpassed the US in innovation performance. To stay ahead, the EU has to prioritise investment in research and innovation, as well as in digital capacities to foster the European technological leadership, bringing sustainable growth to our continent and maintaining our industry as an active competitor globally, at the level of Japan, China or South Korea.

Based on its performance, each member state gets a score relative to the EU28 average (100 points). Sweden is located in the group of "Innovation Leaders" together with Denmark, Finland, Luxembourg and the Netherlands who are above in 120 points of the EU28 average. Performance on those countries generally improved from 2011 to 2019 except in 2014.

The report shows that there is a negative link between the level of and the change in performance over time. Even though Finland is quickly improving its performance and is very close to overtaking Sweden, this Scandinavian country is still the most innovative member state of the EU with 141 points. From 2012 to 2019 Sweden improved its performance by 6.9%.

<sup>84</sup> European Commission. *European Innovation Scoreboard 2020* [online]. DOI: 10.2873/168 [Accessed on 24 June 2020]. Available at: <<https://ec.europa.eu/docsroom/documents/41941>>

### 3.4.1 Sweden's Scores in EIS 2020

The measurement framework is divided into 4 main areas, 10 innovation dimensions, and 27 indicators, which are the following:

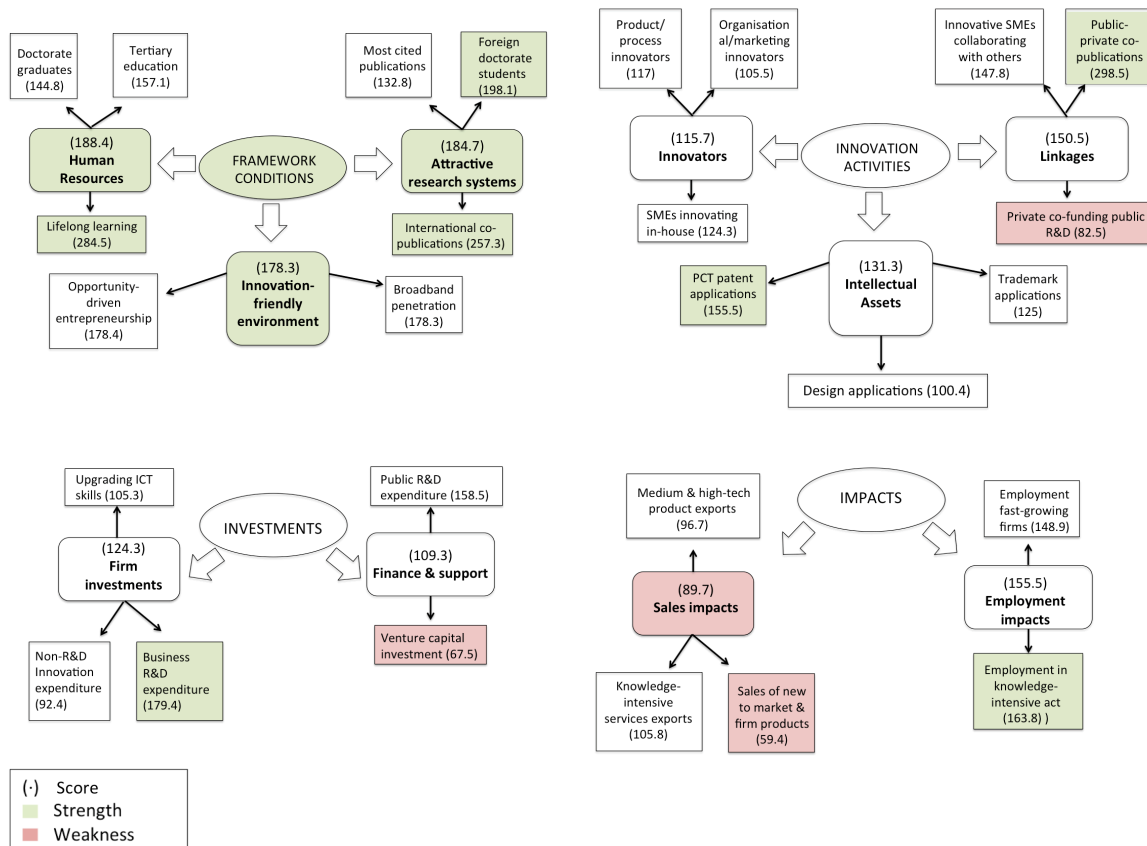


Figure 9. Sweden's 2020 Results at European Innovation Scoreboard.

Source: Compilation prepared by the author based on information supplied by EIS 2020 Data

The sales impact is the weakest innovation dimension for Sweden (89.7 points) with performance below the EU average; the low-scoring indicators include: sales of new-to-market and new-to-firm product innovations (59.4), venture capital expenditures (67.5), and private co-founding of public R&D expenditure (82.5). It scored high on public-private co-publications (298.5), lifelong learning (284.5), and international scientific co-publications (257.3). The strongest innovation dimensions for Sweden were: human resources (188.4), innovation-friendly environment (178.3) and attractive research systems (184.7).

Swedish GDP per capita and top R&D spending enterprises per 10 million people are well above the EU average. It also shows the highest positive difference to the EU in basic-school entrepreneurial education and training, as well as employment share knowledge-intensive services. On the contrary, the employment share in manufacturing and enterprise births are well below the EU average. This data reflects the structural differences with respect the EU.

### 3.5 The Global Innovation Index GII 2019

The Global Innovation Index (GII) has become a valuable benchmarking tool for policy-makers, business leaders, and other stakeholders who can evaluate innovation progress annually.

The 12<sup>th</sup> edition of the GII created by INSEAD Business School presented last year as the central topic *how medical innovation will transform the delivery of healthcare worldwide for the next decade*<sup>85</sup>. Actually, the idea of better assessing health innovation is not new. Sweden and Switzerland have been at the forefront of health technology assessments for many years.

This is the third year in a row that 15 of the top GII 25 economies are from Europe, and seven of them are in the top 10 of the most recent index (2019), which are: Switzerland (1<sup>st</sup>), Netherlands (4<sup>th</sup>), U.K. (5<sup>th</sup>), Finland (6<sup>th</sup>), Denmark (7<sup>th</sup>) and Germany (9<sup>th</sup>).

Sweden is the second most innovative country worldwide. It belongs to the group of high-income countries that have performed above the expectations for their level of development and it has effectively translate its innovation inputs into a higher level of outputs.

The Nordic nation ranks among the top 10 economies of the world in all pillars analysed except for market sophistication (14<sup>th</sup> position). It improves in 4 pillars: business sophistication (1<sup>st</sup>), infrastructure (2<sup>nd</sup>), knowledge and technology outputs (2<sup>nd</sup>) and human capital and research (6<sup>th</sup>). It makes remarkable improvements in: knowledge absorption (6<sup>th</sup>), education (6<sup>th</sup>) ICTs (12<sup>th</sup>), and knowledge diffusion (6<sup>th</sup>). The significant improvements in the knowledge absorption sub-pillar are mainly due to improvements in the indicator FDI inflows, which remains a relative weakness for Sweden.

Regarding the results in the indicators measured, Sweden keeps its 1<sup>st</sup> position in the Patent Cooperation Treaty (PCT), patent applications by origin and Intellectual Property (IP) receipts; and gains the 1<sup>st</sup> position on patent families for the first time (up from the 5<sup>th</sup>).

Its areas for improvement are 10: applied tariff rate (29<sup>th</sup>), printing and other media (47<sup>th</sup>), FDI net inflows (55<sup>th</sup>), “Gross Domestic Expenditure on R&D” (GERD) financed by abroad (55<sup>th</sup>), pupil-teacher ratio (56<sup>th</sup>), GDP per unit of energy use (57<sup>th</sup>), cost of redundancy dismissal (57<sup>th</sup>), high-tech imports (59<sup>th</sup>), ease of getting credit (77<sup>th</sup>), productivity growth (80<sup>th</sup>).

The figure 10 shows all the pillars, sub-pillars and indicators assessed, indicating the strengths in green and weaknesses in red according to the score obtained by Sweden in each one.

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<sup>85</sup> Global Innovation Index 2019. *How medical innovation will transform the delivery of healthcare worldwide for the next decade* [online]. [Accessed on 5 June 2020]. Available at: <<https://www.globalinnovationindex.org/gii-2019-report>>

### 3.5.1 Sweden's Results in the GII 2019

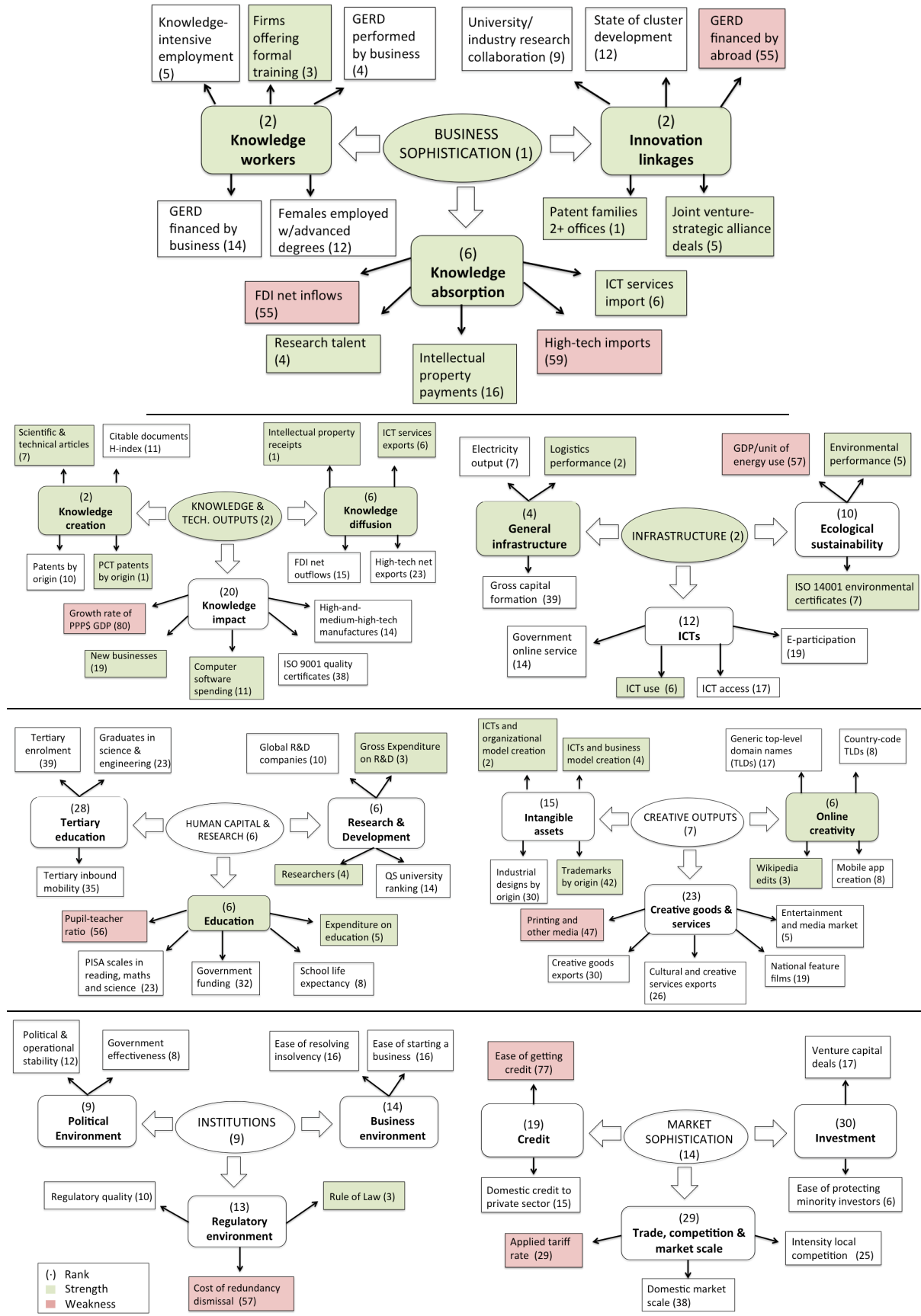


Figure 10. 2019 Sweden's Results at Global Innovation Index.  
 Source: Compilation based on information supplied by GII 2019 Data

### 3.6 Two examples of the Glocal dimension of a Swedish city: Gothenburg

Globalisation with its complex and interrelated flow of people, information, technologies, ideas, resources and media has changed the way diplomacy is being undertaken. These processes are contributing to elevate the role of subnational government stakeholders in the global scene. Consequently, the local level of the public administration may also play an interesting role in STI diplomacy.

This phenomenon is directly related to the *glocal* dimension, a term that originates from the social justice movement in the U.S. *think global, act local*<sup>86</sup>.

The increasingly relevant geopolitical actor: global cities. Big cities are economic, political and innovation powerhouses discreetly transforming the international scene, becoming essential diplomatic players and increasingly bypassing nation states to create city-centred global policies. At the same time, science and technology are the driving forces in economic and social progress and have become key tools to tackle humanity's grand challenges.<sup>87</sup>

During the second half of the 19<sup>th</sup> century, the second industrial revolution broadened the industrialized regions of Europe, expanding north to Oslo and Gothenburg.

Even though Gothenburg is not a global metropolis, or even a capital city, it is considered a cluster that has been thriving over the last decade, but last year the city dropped out of the 100 cluster rankings in the World Intellectual Property Organization (WIPO)<sup>88</sup>. In 2017 it had the 69<sup>th</sup> position in the top-100 clusters' ranking.

Some of its relevant data as a cluster is: the largest patent Swedish applicant is Ericsson with a share of PCT filings of 22.2%; its main field of technology is digital communication with 9.4% share of PCT filings, the largest co-inventor is Stockholm with 12.8% and women inventors is 11.4%.

Gothenburg is relevant in terms of smart and sustainable urban space, both aspects directly related to a well developed and implemented innovation strategy.

#### 3.6.1. Gothenburg at the Global Destination Sustainability Index 2019 (GDS-Index)

The GDS-Index<sup>89</sup> is the leading benchmarking and improvement programme for business tourism and events industry within various destinations around the world. It uses 70 indicators to evaluate the destinations across four key city's performance areas: environmental, social, supplier and destination management organisation (DMO).

Sustainable destinations are places that have achieved long-term equity for people and planet by recognising the systemic and dynamic nature of change. These destinations have actively account for the current and future economic, social and environmental impacts for their events and tourism industry, while engaging and listening to the needs of the host communities, the environment, visitors, and the industry.

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<sup>86</sup> Urban Dictionary. Glocal. [Accessed on 29 June 2020]. Available at: <<https://www.urbandictionary.com/define.php?term=glocal>>

<sup>87</sup> Elorza A., Lacunza I., & Melchor L., *op. cit.* in note 28. [Accessed on 21 June 2020].

<sup>88</sup> Bergquist K., Fink C., Raffo J., *op. cit.* in note 6 [Accessed on 3 June 2020].

<sup>89</sup> Global Destination Sustainability Index. *Gothenburg, Sweden 2019* [online]. [Accessed on 5 June 2020] Available at: <<https://www.gds-index.com/destinations/explore/view/gothenburg/sweden/2019/1>>

Due to the city's efforts within sustainability, accesibility, digitalisation and culture & creativity Gothenburg has held the top ranking in the GDS-Index since 2016.

Social sustainability and inclusion are fundamental issues for Gothenburg as it is a port city that makes it an international and diverse urban area where the exchange of goods and services attracts people's mobility. Therefore the local government has established an ambitious programme to fight segregation and to close the inequality gap. Furthermore, the city received in 2014 the European Access City Award for the strategic and structured work towards a city accessible for all.

Climate and environmental topics are major priorities for the city, in fact, Gothenburg was the first city in the world to issue Green Bonds to accelerate investments in climate-oriented solutions. The second largest city of Sweden produces 66% of its electricity energy from renewable sources, and 30% of its waste is recycled.

### **3.6.2. Gothenburg, the European Capital of Smart Tourism 2020**

European Capital of Smart Tourism initiative recognises outstanding achievements by European cities as tourism destinations in four categories: sustainability, accesibility, digitalisation as well as cultural heritage and creativity. This EU initiative aims to promote smart tourism in the EU, network and strengthen destinations, and facilitate the exchange of best practices.<sup>90</sup>

Gothenburg considers itself a city that makes an impact on important issues. Hence, it has been awarded this year's overall *European Capital of Smart Tourism* and its intention is to use this prize to drive change on a European scale. It won the *Sustainability* partial category as well.

This Scandinavian city recognises its small size to be a weakness, offsetting it by acknowledging the teamwork of its citizens as a strength. That outlook has built a culture of sharing that has helped businesses and projects grow thanks to resilient networks of peers working together.

The city's long-term commitment to cooperate at the EU level to tackle the common challenges faced by tourism destinations can make it a real role model and inspiration for others, contributing to the European overall goals for growth and success, as well as to the United Nations SDG's and creates values for cities, its citizens and visitors.

When it comes to technology and innovation, Gothenburg has great assets and conditions. All major venues are eco-certified and about 92% of the hotel rooms hold an official eco-certification, making Gothenburg one of the greenest hotel cities in the world. Additionally it has reached top mobile connectivity all over town, and soon will upgrade to 5G. This will help digital services become even better and more helpful in people's lives.

Gothenburg aspires to stay on top of digital trends, meaning future-oriented solutions for traffic and transport, open data, as well as sustainability measures. The waterside city works together with a wide variety of stakeholders and sectors to implement a truly integrated approach to smart tourism.

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<sup>90</sup> European Union. *European Capital of Smart Tourism* [website]. [Accessed on 30 June 2020]. Available at: <<https://smarttourismcapital.eu/>>

## CONCLUSIONS

The European Union has a rich spectrum of strategies, policies, initiatives, funding programmes, and institutions related to Science, Technology and Innovation (STI). However, the EU must focus all its efforts dedicated on this huge invertebrate structure towards an Open Innovation Diplomacy (OID) strategy capable of connecting all the existing elements exposed along the second chapter and be able to transform these into effective innovative solutions to Europe's societal problems, which is the overall common goal.

Why choose OID? For several reasons: because as Leijten defends, it is useful to distinguish between science diplomacy and innovation diplomacy as the last one implies competitiveness needed to push forward EU's role in the world. It is part of Moeda's vision of science's fundamental role in international relations advancement. Finally, it is the only target-oriented diplomatic strategy within the STI Diplomacy scope that embraces the social innovation perspective as it includes cultural, socioeconomic and technological divides, as it centers on bridging ideas to solutions, markets to investors, and research to products and services; creating a comprehensive innovation stakeholders' synergy.

In order to make "Europe Stronger and Open to the World" the EU must consider the *diplomacy for science* approach that consists on enabling international science cooperation for improving national capacities, providing a suitable motive for Member States to implicate more in this European dynamic. This approach understands innovation as a *global public good*, and the development of this area a commitment to solve global, European and national challenges, consequently these actors must be interested in supporting this approach.

Nevertheless, the research paper has demonstrated other scenarios already taking place. On one hand, the *protectionism-populism* dynamics that may clash with multilateral and globalisation externalities, prioritising more in domestic issues and considering innovation as an only-national influence asset; or in the other, the *bottom-up innovation* processes born from clusters and innovation eco-systems. For example, the entrepreneur's user driven innovations in sustainable development or urban improvement areas, all which recognise that local actors are better in R&D policy-making than national governments or supranational organisations.

Despite the scenarios described in the paragraph before, OID still can potentially be a pioneering policy-making and governance approach for the EU, its Member States and subnational or local entities, by cooperating together and opening up the innovation process to all STI stakeholders at every level so that knowledge can circulate ubiquitously. This means recognising local actors potential to become global players. In the STI Diplomacy stakeholder's section, it was explained how cities are working on raising their profile in the international arena. They may achieve this by following a *promotion* strategic purpose approach, publicising the city's achievements in the R&D area to attract students, researchers and companies, build up local capacities, reputation and performance, stir innovations and enhance its innovative capacities, or lay grounds for international partnerships.

What about the EU's role in this complex innovation stakeholder's ecosystem? As recognised and demonstrated throughout the drafting of this paper, supranational actors have a decisive position in STI diplomacy as they set the global agenda for common policy goals, the SDGs of the United Nations are the best example of this. Thus, the European Union, holds a key role as an innovation global player, but has no purpose if the social innovation perspective is not reflected at all. The *New European Social Innovation* is inspired in three principles: human-



centred, system focused, and politically engaged. The author considers that these three elements must be at the core of the political, communitarian and foreign European agenda; hence the most appropriate name for this plan would be “*European Social Innovation Diplomacy*”.

The European Union should be praised for its actions centered in boosting local innovation clusters by sponsoring collaborative research infrastructures and generating European contests such as the *European Capital of Smart Tourism* because global cities serve as strategic stakeholders to bring the EU forward in the international arena. Building together scientific and technological capacities at different levels is the channel to flourish as a geopolitical player.

The purpose of this study was to analyse the European STI landscape and diplomacy strategy and to confirm the formulated hypothesis of the leading role Sweden could assume as a driving force to assist the EU in becoming the top global social innovator player. The general objective was accomplished, as the research done has been exhaustive, delivering a well organised structure of the European Science, Technology and Innovation scheme and exposing all the diplomacy aspects and contemporary debates.

The Swedish Innovation Strategy (SIS) aligns perfectly with the European STI diplomacy vision. It is oriented towards social innovation as it speaks about sustainable development, is centered in individuals’ innovative creativeness, contains various stakeholder networks and has the determination to develop Sweden’s leading position in terms of an innovative climate and capacity to meet global societal challenges, increase the competitiveness and renew the future welfare and public services.

The top innovator Member State within the EU is Sweden, being the strongest dimensions scored at the EIS: human resources, innovation-friendly environment and attractive research systems. It stands out on indicators such as public-private or international scientific co-publications. In addition, Swedish GDP per capita and top R&D spending enterprises per 10 million people are well above the EU average.

Sweden is the second most innovative country worldwide; it excelled in three pillars, obtaining the first place in business sophistication, and the second in both infrastructure, and knowledge and technology outputs. The Scandinavian country ranked first in indicators such as the Patent Cooperation Treaty (PCT), patent applications by origin and Intellectual Property (IP) receipts, and patent families for the first time.

In regards to the hypothesis, based on the statistics, indicators and rankings explained along the third chapter of the study, as well as the SIS, is clear that Sweden is the Member State with the vocation and capacity to take the European Union to the global innovation higher level. Notwithstanding the hard work that has to be done to create a coherent and holistic European STI diplomacy strategy that harmonise the supranational, national and local stakeholders interests all together.

## BIBLIOGRAPHY

### Social Sciences Books & Articles in Paper

- Copeland, D., *Guerrilla Diplomacy: Rethinking International Relations*. Boulder: Lynne Rienner Publisher. 2009, ISBN: 978-1-58826-679-8.
- Kao J. *Innovation nation: How America is losing its innovative edge, why it matters, and what we can do to get it back*. Free Press, 2007.
- Moulaert, F. (2009). *Social Innovation: Institutionally Embedded, Territorially (Re)Produced*. Social Innovation and Territorial Development, 2009.
- Mulgan, G. *The Process of Social Innovation, in Innovations. Technology, Governance, Globalizations*, Spring, MIT press, Boston, 2006.
- Nye, J., *Soft Power: The Means to Success in World Politics*. Public Affairs: New York., 2004, ISBN: 978-1586483067.
- Ruffini, P-B., *Science and Diplomacy: A New Dimension of International Relations*, Science, Technology and Innovation Studies. Springer International Publishing, 2017. ISBN-10: 3319551035.
- Westley, F., & Antadze, N. *Making a difference: Strategies for scaling social innovation for greater impact*. Innovation Journal, 15, 2, 2010.

### Digital Resources

#### **Social Studies Academic Articles**

- Bergquist K., Fink C., Raffo J., *Identifying and ranking the world's largest clusters of inventive activity*. Economic Research Working Paper, 34, World Intellectual Property Organization (WIPO), 2017. Available at: <https://www.wipo.int/publications/en/details.jsp?id=4189&plang=EN>
- Berkman, P.A. *Could Science Diplomacy be the key to stabilizing international relations? The Conversation*. 2018. Available at: <https://theconversation.com/could-science-diplomacy-be-the-key-to-stabilizing-international-relations-87836>
- Carayannis E.G., Campbell D.F.J., “Mode 3” and “Quadruple Helix”: towards a 21<sup>st</sup> century fractal innovation ecosystem. International Journal of Technology Management (IJTM) 46,3/4, 2009. Available at: DOI: [10.1504/IJTM.2009.023374](https://doi.org/10.1504/IJTM.2009.023374)
- Carayannis E.G., Campbell D.F.J., *Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other? : A Proposed Framework for a Trans-disciplinary Analysis of Sustainable Development and Social Ecology*. International Journal of Social Ecology and Sustainable Development. 2010. DOI: 10.4018/jesd.2010010105. Available at: <https://www.igi-global.com/article/triple-helix-quadruple-helix-quintuple/41959>
- Carayannis E.G., Campbell D.F.J., *Open Innovation Diplomacy and a 21st Century Fractal Research, Education and Innovation (FREIE) Ecosystem: Building on the Quadruple and Quintuple Helix Innovation Concepts and the “Mode 3” Knowledge Production System*. Journal of the Knowledge Economy 2,327, 2011. Available at: <https://doi.org/10.1007/s13132-011-0058-3>

- Copeland, D. *Bridging the Chasm: Why Science and Technology Must Become Priorities for Diplomacy and International Policy*. *Science & Diplomacy*, 4, 3. Available at: <http://www.sciencediplomacy.org/perspective/2015/bridging-chasm>
- De San Román A., Schunz S. *Understanding European Union Science Diplomacy*. *Journal of Common Market Studies*, 56(2), 2017. pp. 247-266. Available on: <https://doi.org/10.1111/jcms.12582>
- Elorza A., Lacunza I., & Melchor L. *What Is Science Diplomacy?* S4D4C European Science Diplomacy Online Course, Module 2, 2020. Available at: <https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>
- Elorza A., Lacunza I., & Melchor L. *Who are the Science Diplomacy Stakeholders?* S4D4C European Science Diplomacy Online Course, Module 3, 2020. Available at: <https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>
- Elorza A., Lacunza I., & Melchor L., *How does the European Union Practice Science Diplomacy?*. S4D4C European Science Diplomacy Online Course, Module 4, 2020. Available at: <https://www.s4d4c.eu/courses/s4d4c-european-science-diplomacy-online-course/>
- Etzkowitz, H., Leydesdorff, L. *The Triple Helix – University-Industry-Government relations: A laboratory for knowledge based Economic Development*. *EASST Review* 14,1. 1995. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2480085](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2480085)
- Fedoroff, N. *Science Diplomacy in the 21st Century*. *Cell*, 136, 2009, pp. 9-11. Available at: DOI: <https://doi.org/10.1016/j.cell.2008.12.030>
- Flink, T., Rungius C. *Science Diplomacy in the European Union: Practices and Prospects*. S4D4C Policy Brief 1, 2018. Available at: <https://www.s4d4c.eu/wp-content/uploads/2018/11/S4D4C-Policy-brief-Flink-and-Rungius-2018-Science-Diplomacy-in-the-European-Union.pdf>
- Flink, T. & Schreiterer, U., *Science diplomacy at the intersection of S&T policies and foreign affairs: toward a typology of national approaches*. *Science and Public Policy*, 37, 9, 2010, pp. 665–677. DOI: 10.3152/030234210X12778118264530. Available at: [https://www.academia.edu/4031307/Flink\\_T.\\_Schreiterer\\_U.\\_2010\\_Science\\_diplomacy\\_at\\_the\\_intersection\\_of\\_S\\_and\\_T\\_policies\\_and\\_foreign\\_affairs\\_toward\\_a\\_typology\\_of\\_national\\_approaches\\_.In\\_Science\\_and\\_Public\\_Policy\\_37\\_9\\_pp.\\_665-677](https://www.academia.edu/4031307/Flink_T._Schreiterer_U._2010_Science_diplomacy_at_the_intersection_of_S_and_T_policies_and_foreign_affairs_toward_a_typology_of_national_approaches_.In_Science_and_Public_Policy_37_9_pp._665-677)
- Gluckman, P.D.; Turekian, V.; Grimes, R.W.; and Kishi, T., *Science Diplomacy: A Pragmatic Perspective from the Inside*. *Science Diplomacy*, 6, 4, 2017. Available at: [http://www.sciencediplomacy.org/files/pragmatic\\_perspective\\_science\\_advice\\_dec2017\\_1.pdf](http://www.sciencediplomacy.org/files/pragmatic_perspective_science_advice_dec2017_1.pdf)
- Grimes, R. & Hennessey, E. *Why Science Is in the Diplomatic Toolkit*. *Science in Parliament*, 72, 2, 2015. Available at: <https://www.scienceinparliament.org.uk/wp-content/uploads/2015/06/WHY-SCIENCE-IS-IN-THE-DIPLOMATIC-TOOL-KIT-by-Professor-Robin-Grimes-and-Dr-Emma-Hennessey.pdf>
- Leijten, J. *Science, technology and innovation diplomacy: a way forward for Europe*. EL-CSID Project – Institute for European Studies (IES). 2019. Available at: <https://www.ies.be/node/4930>
- Moedas, C. *Science Diplomacy in the European Union*, *Science & Diplomacy*, 5, 1, 2016. Available at: <http://www.sciencediplomacy.org/perspective/2016/science-diplomacy-in-european-union>

Phills J., K. Deiglmeier & Miller D. *Rediscovering Social Innovation*. Stanford Social Innovation Review, 2008. Available at: [https://ssir.org/articles/entry/rediscovering\\_social\\_innovation#](https://ssir.org/articles/entry/rediscovering_social_innovation#)

Rüffin, N. *EU Science Diplomacy in a Contested Space of Multi-Level Governance. Ambitions, Constraints and Options for Action*. Research Policy. 2019. Available at: <http://dx.doi.org/10.1016/j.respol.2019.103842>

Sassen, S. *Cities in a World Economy*. Sociology for a New Century Series, 269. 2012. Available at: <https://doi.org/10.1007/s13398-014-0173-7.2>

Van Langenhoven, L. *Tools for an EU Science Diplomacy*. European Commission. DG for Research and Innovation. DOI:10.2777/911223. 2017. Available at: <https://op.europa.eu/en/publication-detail/-/publication/e668f8cf-e395-11e6-ad7c-01aa75ed71a1>

### **International Organisations and Public Institutions publications:**

Digital Social Innovation. *Digital social innovation, a relatively new concept*. 2015. Available at: <https://digitalsocial.eu/blog/5/digital-social-innovation-a-relatively-new-concept>

Global Destination Sustainability Index. *Gothenburg, Sweden 2019*. Available at: <https://www.gds-index.com/destinations/explore/view/gothenburg/sweden/2019/1>

Global Innovation Index 2019. *How medical innovation will transform the delivery of healthcare worldwide for the next decade*. Available at: <https://www.globalinnovationindex.org/gii-2019-report>

OECD/Eurostat. *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition*. The Measurement of Scientific, Technological and Innovation Activities, 2019. Available at: <https://doi.org/10.1787/97892264304604-en>

Swedish Ministry of Enterprise, Energy and Communications. *The Swedish Innovation Strategy*. 2014. Available at: <https://www.government.se/information-material/2012/10/the-swedish-innovation-strategy/>

The Royal Society. *New frontiers in science diplomacy*. RS Policy document. The Royal Society, 2010. Available at: [https://royalsociety.org/%7E/media/Royal\\_Society\\_Content/policy/publications/2010/4294969468.pdf](https://royalsociety.org/%7E/media/Royal_Society_Content/policy/publications/2010/4294969468.pdf)

The Young Foundation. *Social Innovation Overview: A deliverable of the project: "The theoretical, empirical and policy foundations for building social innovation in Europe"*. TEPSIE, European Commission – 7<sup>th</sup> Framework Programme, Brussels: European Commission, DG Research, 2012. Available at: <https://youngfoundation.org/wp-content/uploads/2012/12/TEPSIE.D1.1.Report.DefiningSocialInnovation.Part-1-defining-social-innovation.pdf>

S4D4C. *The Madrid Declaration on Science Diplomacy*. 2019. Available at: <https://www.s4d4c.eu/s4d4c-1st-global-meeting/the-madrid-declaration-on-science-diplomacy/>

Science Diplomacy [website]. Available at: <https://www.science-diplomacy.eu>

Social Innovation Academy. *Introduction to Social Innovation*. Available at: <http://www.socialinnovationacademy.eu/introduction-to-social-innovation/>

Swedish Ministry of Enterprise, Energy and Communications. *The Swedish Innovation Strategy*. 2014. Available at: <https://www.government.se/information-material/2012/10/the-swedish-innovation-strategy/>

Urban Dictionary. *Glocal*. Available at: <https://www.urbandictionary.com/define.php?term=glocal>

## European Union's websites and publications:

### *European Commission*

2020 Country Specific Recommendations. *Research and Innovation analysis*. DG for Research and Innovation. Available at: [https://rio.jrc.ec.europa.eu/sites/default/files/report/2020\\_Compndium\\_CSRS\\_Communication.pdf](https://rio.jrc.ec.europa.eu/sites/default/files/report/2020_Compndium_CSRS_Communication.pdf)

*Assessment of the Europe 2020 Strategy*. DG for Employment, Social Affairs and Inclusion. 2019, p. 109. Available at: <https://op.europa.eu/es/publication-detail/-/publication/9c2013d6-01f3-11ea-8c1f-01aa75ed71a1>

DG for Research and Innovation [website]. Available at: [https://ec.europa.eu/knowledge4policy/organisation/dg-rtd-dg-research-innovation\\_en](https://ec.europa.eu/knowledge4policy/organisation/dg-rtd-dg-research-innovation_en)

*Enhanced European Innovation Council (EIC) pilot* [website]. Available at: <https://ec.europa.eu/research/eic/index.cfm>

EURAXESS [website]. Available at: <https://euraxess.ec.europa.eu/>

*Europe 2020. A strategy for a smart, sustainable and inclusive growth*. 2010. Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

*Europe 2020 Flagship Initiative Innovation Union*. DG for Research and Innovation. 2011. DOI: 10.2777/27497. Available at: [https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication-brochure\\_en.pdf](https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication-brochure_en.pdf)

*European Innovation Scoreboard 2020*. DOI: 10.2873/168. Available at: <https://ec.europa.eu/docsroom/documents/41941>

*European Research Area (ERA)* [website]. Available at: [https://ec.europa.eu/info/research-and-innovation/strategy/era\\_es#what](https://ec.europa.eu/info/research-and-innovation/strategy/era_es#what)

*European Research Infrastructure Consortium (ERIC)* [website]. Available at: [https://ec.europa.eu/info/research-and-innovation/strategy/european-research-infrastructures/eric\\_en](https://ec.europa.eu/info/research-and-innovation/strategy/european-research-infrastructures/eric_en)

*Europe's Future: Open Innovation, Open Science, Open to the World. Reflections of the Research, Innovation and Science Policy Experts (RISE) High Level Group*. Directorate-General for Research and Innovation. DOI:10.2777/514910. Available at: <https://op.europa.eu/en/publication-detail/-/publication/15e2ff8d-c525-11e8-9424-01aa75ed71a1>

*Horizon 2020* [website]. Available at: <https://ec.europa.eu/programmes/horizon2020/en>

*H2020 Country Profile* [application]. Available at: <https://webgate.ec.europa.eu/dashboard/extensions/CountryProfile/CountryProfile.html?Country=Sweden>

*Horizon Europe* [website]. Available at: [https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme\\_en](https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en)

*Infographic: How the Scientific Advice Mechanism works*. Available at: [https://ec.europa.eu/info/publications/infographic-how-scientific-advice-mechanism-works\\_en](https://ec.europa.eu/info/publications/infographic-how-scientific-advice-mechanism-works_en)

*Joint Research Centre (JRC) – EU Science Hub. Bringing together scientific knowledge for Europe* [website]. Available at: <https://ec.europa.eu/jrc/en>

*Leveraging digital social innovation perspectives from the IESI knowledge map*. JRC Directorate Growth & Innovation, Human Capital & Employment Unit, IESI Research. JRC Insights – Social Policy Innovation Series, 2, 2017. Available at: <https://ec.europa.eu/jrc/sites/jrcsh/files/jrc105678.pdf>

*Strategic Forum for International Cooperation* [website]. Available at: <https://ec.europa.eu/research/iscp/index.cfm?pg=sfic-general>

*The EU as a stronger global actor. Towards a more united, stronger and more democratic union*. DOI:10.2775/98393. 2019. Available at: <https://ec.europa.eu/commission/sites/beta-political/files/euco-sibiu-stronger-global-actor.pdf>

*What the Commission does on social innovation* [website]. Internal Market, Industry, Entrepreneurship and SMEs. Available at: [https://ec.europa.eu/growth/industry/policy/innovation/social\\_en](https://ec.europa.eu/growth/industry/policy/innovation/social_en)

#### **Other EU's online resources:**

European Union. *European Capital of Smart Tourism* [website]. Available at: <https://smarttourismcapital.eu/>

European Institute of Innovation & Technology. *EIT. Making innovation happen* [website]. Available at: <https://eit.europa.eu/>

European Research Area and Innovation Committee – ERAC. *ERAC opinion on the future of the ERA*. 2020 Available at: <https://data.consilium.europa.eu/doc/document/ST-1201-2020-INIT/en/pdf>

European Research Council. *ERC, Supporting top researchers from anywhere in the world* [website]. Available at: <https://erc.europa.eu/>

European Strategy Forum on Research Infrastructures (EFRI). *Making Science Happen* [website]. Available at: <https://www.esfri.eu/>

Eurostat. *Europe 2020. Headline Indicators: Scoreboard*. Available at: <https://ec.europa.eu/eurostat/web/europe-2020-indicators/europe-2020-strategy/headline-indicators-scoreboard>

Moedas, C. *A new start for Europe: Opening up to an ERA of Innovation*. 2015. Available at: [https://ec.europa.eu/commission/presscorner/detail/de/SPEECH\\_15\\_5243](https://ec.europa.eu/commission/presscorner/detail/de/SPEECH_15_5243)

PRIMA. *Partnership for Research and Innovation in the Mediterranean Area* [website]. Available at: <http://prima-med.org>

SFIC. *Input paper by the SFIC Science Diplomacy Task Force*. ERAC-SFIC 1352/20, 2020. Available on: <https://data.consilium.europa.eu/doc/document/ST-1352-2020-INIT/en/pdf>