Chapter 4
Science Diplomacy and the European Union

Introduction

One global actor that extensively applies soft power is the European Union (EU). A curious polity, it does not have a clearly defined central authority, “demos”, or geographical, administrative, economic, and cultural border. In addition, its foreign and security policies are often a combination of bilateral and multilateral initiatives with mixed amounts of participation willingness on the part of member states. The foreign policy strategy of this polity is mostly centred on promoting the values and principles outlined throughout European integration in its international relations. Many international relations scholars consider the EU to be a polity that uses its economic weight, financial rewards, and “punishments” to push its normative agenda on third countries, using persuasive soft power instruments in its public diplomacy (Michalski 2005). The EU is in a strong position to exert influence in international relations given its economic, geographical, and demographic size. Its 27 member states have a total population of more than 400 million, and the Euro is the second most important international reserve and trade currency, meaning that the economic weight of the EU allows it to exert great power through norms and regulations. From a “hard power” perspective, the EU’s normative power rests on the attractiveness of its markets in international trade. This leads to considerable leverage on third countries interested in conducting commerce with European countries. However, from a soft power perspective the EU defends and promotes its

I do not pretend to start with precise questions. I do not think you can start with anything precise. You have to achieve such precision as you can, as you go along.

Bertrand Russell
nomative power through other means. Not only do many countries consider Europe as a role model for democracy, human rights, stability, and social policy, but also the EU is considered one of the most effective actors in the field of humanitarian intervention through the Humanitarian Aid and Civilian Protection department of the European Commission. In addition, it is the largest development donor when it comes to aid and has considerable influence in tackling development issues on the ground, especially through its 140 delegations and offices around the world. The “enlargement fatigue” felt by many sections of the EU’s public opinion made many of its leaders and policymakers become increasingly focused on consolidating the polity’s place in international relations.

Science Diplomacy and the European Union: A Brief History

The EU embarked on an ambitious project to use its normative power in the defence and expansion of food safety, environmental standards, human rights, democracy, labour standards, sustainable development, poverty eradication, free and fair trade, international law, and multilateralism, to name but a few. The EU attempts to advance the universal benefits of these values and norms while simultaneously using its normative power to keep economic leadership through free trade agreements and persuasion in an effort to attract innovators, scientists, and other talented, educated, and ambitious individuals. According to the Treaty on the Functioning of the European Union (TFEU) the external action objectives of the EU (The European Union 2016:28–29) are to:

1. Safeguard European values, fundamental interests, independence, integrity, and safety.
2. Consolidate and uphold democracy, the rule of law, human rights, and principles of international law.
3. Preserve the peace, prevent conflicts, and strengthen international security.

Given the increasing uncertainty of international relations, it is very important for the EU to be able to adapt to new conditions. Despite the fact that many international stakeholders view the EU’s multilateralism positively, in bilateral terms many consider that the EU is not sufficiently coherent; making the aggregation of both seems eclectic. This can be problematic given that international diplomats and other policy stakeholders often see great potential in the EU’s diplomatic activism despite its frequent lack of vision (because of difficult coordination among member states) in areas such as global security. It is essential that the Union continue to develop and promote comprehensive strategies for international governance so that the EU is clear on how it wants to achieve its foreign policy objectives. These strategies should be solid while also leaving room for flexibility given the uncertain and fluctuating nature of international relations in the twenty-first century. To this end, science diplomacy is an essential opportunity for the EU (European Union 2016).

Recent interest in science diplomacy between the EU and third countries reflects the history of its practice between European countries since the end of World War
II. Some of the world’s most prominent scientists left the Continent during the War, meaning that conditions for their return had to be developed. In addition, higher technological costs and post-war financial difficulties made it difficult for the European countries to pursue scientific projects on national lines. These conditions led several scientific communities to push for the establishment of the European Organization for Nuclear Research (CERN) in 1954. Twelve European countries (including France, Germany, Italy, and the United Kingdom) were signatories to this organization in order to establish science as a unifying force for peace, in addition to pooling resources to reduce the individual cost of research. We can see through this example how science was used to reduce tensions as well as solve pragmatic issues (Moedas 2016). Science cooperation has always been an important part of the European integration as it has a potential for reducing the likelihood and escalation of armed conflict. The European Commission and member states also established the Joint Research Centre in 1957, European Cooperation in Science and Technology (COST) program in 1971, and the Eureka network in 1985. Of the last two, the former established a pan-European network of researchers of all scientific fields while the latter combined universities, research institutes, small and medium-size enterprises (SMEs), and large firms in order to foster an innovative economy. Ten European countries also agreed to the establishment of the European Space Research Organisation in 1962 through the initiative of prestigious scientists such as Pierre Auger (French) and Edoardo Amaldi (Italian)—both of which had been key in establishing the CERN—followed by its successor the European Space Agency in 1975. Collaboration with non-community countries was first officially mentioned in the Single European Act of 1987 despite the fact that it had begun in 1983 with the Science and Technology for Development program. One of the landmarks of European international prestige and soft power in science is the CERN, especially when it began to build the Large Hadron Collider in the 1990s. Completed in 2008, the Collider was successfully built with the help of more than 10,000 scientists from over 100 countries, showing how combining international talent could lead to great advancements in science (the Higgs particle was discovered through the Collider in 2012). Other experiments and instruments were constructed within the Large Hadron Collider such as the Toroidal LHC Apparatus (ATLAS), Compact Muon Solenoid (CMS), and A Large Ion Collider Experiment (ALICE), all of which further extended the CERN’s influence in the global scientific community. In addition to the CERN’s European dimension, its positive reputation has provided opportunities to collaborate with countries and projects that are not directly linked to the organization. The EU’s connection to the CERN and the positive reputation of research in Europe have led to the EU becoming an observer for Jordan’s Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME). SESAME’s goal is to gather the brightest and most talented scientists of the region, especially during the current climate of conflict, to boost regional networks for innovation and learning. Several opportunities have arisen for science in Europe due to the rise of the Information Age. It should be noted that Tim Berners-Lee, an English scientist employed at the CERN, invented the World Wide Web in 1989 and wrote the world’s first web browser. Following this revolutionary advancement in communication, ideas were able to flow much more quickly and
freely across national borders. In addition, technological advancements developed by inter-European research and development initiatives further improved communications through the introduction of low-cost air travel. Another area in which European integration drastically improved the spread of ideas and mobility was through the Erasmus program (1987) that allowed millions of students to conduct exchanges in the universities of the signatory countries. All in all, it is clear that the EU has historically been very focused on science as a vehicle for integration, understanding, and intercultural dialogue. Scientists and researchers have been able to push for a EU’s policy whereby European research is recognized through a “brand of excellence”. To this end, the European Research Council (ERC) was established in 2007 to encourage, maintain, and further the EU’s ability to launch cutting-edge research, especially when providing grant funding that has a foreign dimension. Such efforts were reinforced with the mandate of the Treaty of Lisbon in 2009, especially when it came to funding research and innovation that could provide economic and social benefits across the continent. As Section 1 of Article 179 of the Treaty on the Functioning of the European Union (TFEU) (The European Union 2016:128) states:

*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, and encouraging it to become more competitive, including in its industry, while promoting all the research activities deemed necessary by virtue of other Chapters of the Treaties.*

Reinforcing the Union’s scientific mandate through Article 179 of TFEU not only legitimized investing in new infrastructure and institutions, but also reinforced and validated much of the work done in the long and near past. For example, the creation of the European Research Area (ERA) was also mentioned in the Treaty and was founded in 2000 in order to foster further integration of research and resources from a multinational perspective. Popular among scientists, it focuses on cooperation in research areas such as medicine, industry, socio-economic issues, and the environment. Today, several EU institutions are responsible for developing science diplomacy with third countries. From the European Commission’s perspective this falls under the competence of the DG for Research and Innovation (DG RTD). Given the foreign policy dimension of science cooperation, DG RTD works also with the European External Action Service (EEAS). On an intra-EU level, the Council’s Strategic Forum for International Science and Technology Cooperation (SFIC) is responsible for developing and organizing the European Research Area (ERA) and the European Research Area and Innovation Committee (ERAC), also advising the Commission when necessary. Member states are represented through the SFIC’s structure which allows them to discuss and develop the frameworks and objectives necessary to develop the ERA on an international level. Opinions and decisions are then communicated to member states and to the European Commission (EC). In May 2015 the Council decided to place “international cooperation” as a priority within the ERA’s mandate. After the European Commission proposed a strategy for scientific cooperation in 2012, a 2014 report on its implementation
stated that common principles and frameworks had to be developed, as well as the EU’s strength in multilateralism should be maximized to advance the strategy’s two main approaches: openness and targeted activities. EC’s former President Juncker (2014–2019) has established science diplomacy as a top priority for his term in office in order to foster economic growth, employment, and development and overcome international issues such as climate change, climate, migration, international conflicts, and energy security. This has led Carlos Moedas (then Commissioner for Research, Science, and Innovation, 2014–2019) to develop an active and visible role for European Science Diplomacy on the international scene:

*Using the universal language of science to maintain open channels of communication in the absence of other viable Foreign Policy approaches, ensuring the EU maintains its presence at the highest level of international scientific endeavour; and ensuring the EU has access to research performed outside Europe* (Moedas 2016).

We can deduce from this statement and from EU foreign policy that the goals of scientific cooperation in the European Union can be reduced to three objectives:

1. Maintaining and strengthening excellence and attractiveness for European research, innovation, and industries to remain competitive in this era of globalization
2. Addressing issues such as higher systematic risk in the different dimensions of international security
3. Furthering the soft power potential of European science and research in its external dimensions (The European Parliament 2015)

The strategy was approved by the Council of Ministers during the preparation of Horizon 2020 (Prodi 2015). Many of the targeted countries were within the grasp of the European Neighbourhood Policy (ENP) and included future enlargement candidates as well as the European Free Trade Association (EFTA) members. Under this category, the long-term objective of the EU is to establish a Common Knowledge and Innovation Space for the sake of diplomacy for science and science for diplomacy. On the other hand, the other targeted groups in the strategy are emerging economies and industrialized countries. In the former group the EU targeted Brazil, Russia, India, China, and South Africa, while in the latter group the targets were Canada, South Korea, Japan, and the United States. Finally, the last target group were developing countries as a part of science diplomacy’s efforts to solve global issues such as exclusion, poverty, conflicts, and environmental issues. The EU disposes of three policy instruments for science diplomacy: international agreements, science counsellors, and cooperation schemes. In brief, agreements are implemented through DG RTD and are mostly indefinite. Several activities can be included in these agreements, ranging among joint projects, seminars, research exchanges, pooling resources, and managing intellectual property rights, all of which are generally managed by steering committees that are established upon ratifying the agreement. Science counsellors in the EU answer to DG RTD but also work with the EEAS. They are responsible for policy analysis, development, representation, and communication. One cooperation scheme is that of associated country. This allows
the third country to enjoy the same rights and obligations as a member state for the framework program in question. Only EFTA, candidate, and potential candidate countries are allowed to become associated countries. In addition, under the openness strategy other third countries are eligible to participate in the framework program. However, unless essential to the running of the research project, high-income countries are barred from receiving the EU funds. Emerging countries such as Brazil, Russia, India, Mexico, and China are no longer automatically eligible to receive funding under the Horizon 2020 program (now Horizon Europe). Actions to extend the international scope of science have also been supported by the European Parliament in 2008 and 2011, promoting higher degrees of cooperation for third countries within existing frameworks. It is important to remember that international agreements for scientific cooperation fall under the consent procedure since the Lisbon Treaty. It is understandable that the European Parliament (EP) has stated its “intent to request the Council, where appropriate, not to open negotiations on international agreements until Parliament has stated its position” (The European Parliament 2015): This makes the European Parliament an essential actor in European Science Diplomacy.

Horizon 2020 (now Horizon Europe) was one of the largest research programs in the world and one of the reasons behind the Commission’s efforts to expand science diplomacy. Open to both public and private research organizations across the globe, it also focused on key development research in fields such as food scarcity, nutrition, and sustainable infrastructure to name but a few. It replaced the Seventh Framework Programme for Research (FP7) with a budget of almost €80 billion, €25 billion more than previously. Of these, over €6 billion was reserved for providing career development opportunities for researchers and innovators through the Marie Skłodowska-Curie (MSCA) actions. They provide grants for an array of research profiles and encourage exchanges between European and foreign scientists from research-based universities, companies, and institutions. Fostering relations with innovation-driven countries is a strong part of the EU’s science diplomacy strategy. To this end, its delegations in Asian countries have established a research and innovation section. Established in India, China, and Japan, these sections provide logistical and communication assistance between the delegation and the countries in question. Over 6000 Asian researchers conducted research in the EU through the Marie Skłodowska-Curie actions during the Seventh Framework Programme of Research and Development (2007–2014). The 2012 ASEAN-EU Year of Science, Technology, and Innovation (STI) provided an opportunity to advance science diplomacy with Southeast Asia, organizing 50 events in 13 countries and establishing partnerships between 40 institutions in both regions. Networking and cooperation were promoted on a bilateral and multilateral level (Vandewalle 2015). The Erasmus+ program has also invested €14.7 billion for the 2014–2020 period to allow European and non-European students and staff to enter exchange and training programs with an EU grant, seeing an opportunity to attract and develop human capital and intensify the internationalization of higher education.

In order to promote mutually beneficial cooperative and fruitful relationships, the EU has embarked on a number of science diplomacy programs. For example,
inter-European exchanges and research through the European Space Agency (ESA) led to the launching of the Rosetta Mission in 2004, making this the first successful landing of a lander module on a comet in orbit. In addition to inter-European cooperation, the ESA has also established partnerships with China and the United States to develop human spaceflight ventures and satellite collaborations. Commissioner Moedas made it clear upon assuming his post in 2014 that he would use the history of post-war science diplomacy in Europe as a model to be extended to third countries in an effort to bridge divides, foster dialogues, and attract human capital to the EU. For example, the European Research Council (ERC) has placed seven implementing arrangements in agreements signed by the EU and third countries on matters of science, technology, and innovation. This would allow scientists early in their careers to be a part of research projects and teams run by ERC grantees in Europe. In addition, at the Biennial Summit between the EU and the Community of Latin American and Caribbean States (CELAC) all parties agreed to establish a Common Research Area (CRA) for these regions, encompassing over 1 billion people, 61 countries, and one-third of the United Nations’ members. Areas of particular interest for research and science diplomacy included health research, renewable energies, marine sciences, green economy, and sustainable models for urbanization, and mobility, funding, and research opportunities were allowed for scientists from any of the involved countries. In addition to bilateral agreements between countries and world regions, the EU has had a leading role in the Intergovernmental Panel on Climate Change (IPCC), sending scientists to educate international policymakers and other stakeholders in solving this issue. As EC’s former President Juncker claimed, the EU’s technological and knowledge resources are of immense added value in raising the awareness of international politicians and citizens on climate change. The European Commission has also used multilateralism with NATO, G7, and UN members on security issues such as nuclear proliferation and rise of terrorism. As previously mentioned in this section, climate change, exclusion, and rise of non-state actors intersect when explaining the rise of risks, vulnerabilities, and conflict in the international community. President Juncker made this clear at the State of the Union in September 2015:

> In some parts of the world, climate change is changing the sources of conflict – the control over a dam or a lake can be more strategic than an oil refinery. Climate change is even one of the root causes of a new migration phenomenon. Climate refugees will become a new challenge – if we do not act swiftly (Juncker 2015).

In a speech delivered at the Chinese Academy of Social Sciences, Federica Mogherini, the former High Representative of the European Union for Foreign Affairs and Security Policy 2014–2019, re-emphasized the EU’s commitment to multilateralism and the prevention of conflict. During her analysis of the EU Global Strategy of 2016 she stated:

> [International] cooperation is vital and partnership is essential. And this is particularly true for partnerships among the world powers. A confrontation between global players would lead us nowhere. This is a world of win-win or lose-lose situations. And it is maybe the first time that the European Union states this so clearly in a strategic document. Only cooperation can make us stronger, the both of us. And it is our intention to invest in the
strength of our partners worldwide. This is one of the key lessons of our European integration and also of our European history... this is the European way of foreign policy. Investing in partnerships, cooperation... in the framework of international rules and international norms... for us in the European Union it is vital to build cooperation on the world scene (Mogherini 2016).

One of the areas in which High Representative Mogherini wished to expand cooperation was international crisis management, emphasizing prevention and post-crisis scenarios. One of the main objectives of the Strategy was (it is still so) to strengthen the resilience of states and societies in regions such as sub-Saharan Africa and Asia given that “peace is not just about military operations and blue helmets”. Mogherini emphasized the essential role that employment, growth, good governance, open societies, human rights, and climate change prevention play in guaranteeing resilient and prosperous regions. She made it clear that achieving Sustainable Development Goals (SDGs) was linked to crisis prevention and lower international risks, stating that initiatives such as the Asia Infrastructure Investment Bank were positive developments in achieving these goals (Mogherini 2016). Mogherini’s speech highlighted the priority given by the EU to multilateralism and solving international issues through comprehensive approaches. It showed once again the value that European scientists and technical advisors can have in diplomacy and risk prevention/reduction.

**Scientific Advice in the EU Institutions**

Science diplomacy cannot succeed in the EU’s foreign policy if domestic institutions and stakeholders do not use scientific advice in policymaking. To this end, the European Commission defined guidelines in 2002 for the use of science advice. Directorates and departments are expected to use intra-institutional expertise unless external sources are needed. The Joint Research Centre (JRC) provides evidence-informed and independent expertise through different institutes divided into subject areas. These include environment, energy, security, health, and measurement standards. In addition to the JRC, other directorates and departments also have their own expert groups and committees that provide advice in more specific areas. The EU also disposes of several specialized agencies that can give advice to policymakers in several institutions. They can also coordinate technical expertise between national associations. For example, the European Academies’ Science Advisory Council (EASAC) allows national institutions to create common platforms, projects, and advice to the EU institutions through workshops and studies in energy, biosciences, and environment to name but a few. The European Parliament’s science advice comes from the Scientific Foresight (STOA) Unit of the European Parliamentary Research Service (EPRS). It detects emerging issues within current policy debates and provides potential courses of action for Members of the European Parliament (MEPs) and their assistants. The Unit can produce reports and briefings on its own initiative as well as on request from Members of the European Parliament.
In addition to the STOA, the committees, inter-parliamentary delegations, and other subgroups are permitted to seek advice and research externally. Said expertise mostly comes from the Policy Departments of the DGs for Internal and External Policies.

In addition, the position of Chief Scientific Advisor (CSA) was established in 2010 to give advice, establish networks with other science advice entities, detect future issues in foreign policy, and promote European science across the world. One of the first creations at the CSA’s request was the President’s Science and Technology Council (STAC) in 2013 with the intent of promoting European evidence-informed policymaking and fostering knowledge and awareness of the importance of science and technology in society. It also set up the European Science Advisors Forum (ESAF) in 2014 that acts as a network of individual national government advisors for the member states, allowing them to discuss strategies and issues in order to indirectly Europeanize frameworks and approaches. Despite the relatively recent creation of both the CSA and the STAC, both bodies were dismantled under President Juncker because some European actors feared competence overlap and an excess concentration of power into few hands. This led to the creation of the European Political Strategy Centre (EPSC) in 2014 outlining future policy strategies exclusively to the President of the European Commission. However, the most important recent development in light of using science for policymaking is the creation of the Scientific Advice Mechanism (SAM) in 2015 under President Juncker “to make sure that Commission proposals and activities are based on sound scientific evidence and contribute best to our jobs and growth agenda” (Reillon 2015). The SAM has the overall objective to ensure a high-quality scientific advice to the European Commission. In line with the Better Regulation Agenda, the Mechanism was set up in 2015 through the European Commission’s decision C(2015) 69461 and its core is the High Level Group of Scientific Advisors, composed by seven experts identified by an independent committee and appointed for the first time by Carlos Moedas. Their tasks are:

1. Providing the Commission with independent scientific advice on specific policy issues (such as renewable clean energy, ocean protection, new techniques in agricultural biotechnology, cybersecurity, to name but a few) where such advice is needed for the development of the EU policies or legislation
2. Supporting the European Commission in identifying those policy issues where scientific advice is strongly required
3. Providing recommendations for improving the overall interaction between the European Commission policymaking processes and independent scientific advice concerning any field of the EU’s policymaking process

Being one of the most rationalized science advice mechanisms to date, having introduced the SAM helps solve several logistical and information issues in the EU’s current advisory framework. As we have seen, European institutions and

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1 https://ec.europa.eu/research/sam/pdf/c_2015_6946_f1_commission_decision_en_827417.pdf.
member states have their own sources of scientific advice for policymaking. In the former case these models are extremely diverse and have a range of all the structural possibilities outlined by the OECD’s technical report. In the case of institutions such as the European Commission we have seen that science advice policymaking essentially stems from external experts, the Joint Research Centre, and programs financed by Horizon 2020. Despite attempts outlined in this chapter, logistically speaking, national and European efforts have not been sufficiently coordinated to always provide adequate timely, independent, and high-quality science advice across all policy fields. To this end, the SAM’s aim is to provide a unified structure and coordination mechanism between the scientific advisory bodies of member states and introduce an additional European layer of science advice to policymaking. Said additional layer is the High-Level Group of independent eminent scientists (The European Commission 2015a, b). These experts can be European or non-European and are logistically supported by DG Research and Innovation with a 20–25-person secretariat. Commissioner for Research, Science, and Innovation acts as an intermediary between the High-Level panel and the other Commissioners, including the President of the European Commission and the President of the EU. Coordination between national bodies and the High-Level panel falls under the competence of a new unit within DG Research and Innovation staffed by almost 25 people (EURAXESS 2015; European Commission 2015a, b).

Responsible Research and Innovation

The Responsible Research and Innovation (RRI) is an approach integrated in the Framework Programme Horizon 2020 that foresees and evaluates potential implications and societal expectations of the outcomes produced by research and innovation, aiming at fostering the design of inclusive and sustainable research and innovation. Despite the increasing policies based on populist narratives rather than evidence, RRI was born with the scope of aligning research and innovation by employing mutual values, needs, and expectations, and by assuring greater cooperation among stakeholders, researchers, and citizens. The DG RTD of the European Commission, indeed, aims at bridging the gap between science and European citizens. RRI engages society, integrates the gender and ethical dimensions, ensures access to research outcomes, and encourages formal and informal science education (European Commission 2017:8). The final scope is to guarantee research integrity, open access to scientific results, and gender equality in every research content. In 2007, under the Seventh Framework Programme (FP7), the label “Science and Society” became “Science in Society” to underline the importance of the public engagement in the scientific world and the two-way dialogue between science and civil society. This aim was completely developed under Section V “Science with and for Society” (SwafS) of Horizon 2020. The need of forming RRI arose from the assessment that present research and innovation systems were undergoing several changes driven by globalization and proliferation of digital technologies. The big
societal challenges that lie in our future path would have a better chance of being tackled if all societal actors involved are fully engaged in the co-construction of innovative solutions, products, and services. It was in 2011 that the first public statement about the significance of RRI was made. Octavi Quintana, Director of the European Research Area (ERA), stated: “We need your help to define responsible research and innovation. After several years of research on the relation between science and society, we evidenced that we need to involve civil society very upstream to avoid misunderstanding and difficulties afterwards ...” (Owen 2012:752).

The Responsible Research and Innovation framework consists of six dimensions (European Commission 2014:2):

- **Choose together:** The first dimension, multi-actor and public engagement (PE), is about co-creating the future by bringing together the widest possible diversity of actors, including researchers and innovators, industry and SME, policymakers, non-governmental organizations (NGOs), civil society organizations, and citizens, that would not normally interact with each other, on matters of science and technology, in particular to tackle the grand societal challenges that lie before us. Public engagement implies a two-way, iterative, inclusive, and participatory process of multi-actor exchanges and dialogues (also involving minorities, considering gender and multiple generations). Public engagement in research and innovation fosters more societally relevant, desirable, and creative research and innovation actions and policy agenda, leading to wider acceptability of science and technology outcomes.

- **Unlock the full potential:** The second dimension is gender equality. Engagement means that all actors—women and men—are on board. The under-representation of women must be addressed. Research institutions, in particular their human resources management, need to be modernized. The gender dimension must be integrated in research and innovation content.

- **Creative learning fresh ideas:** The third dimension is science education. The world is changing rapidly and the responsibility for addressing societal challenges needs to be shared through the engagement of all societal actors across Europe. However, the key for co-creation within the research and innovation process is one of enabling sustained dialogue. But before this can happen, the language and tools of science need to be available to everyone. Science education is essential to making this happen. Children and young people enter the education systems with natural curiosity and creativity; recognizing and nurturing this will require changes in both the values and governance of science education.

- **Share results in advance:** Science has always been open, unlike the processes for producing research and diffusing its results. It is widely agreed that making research results more accessible contributes to improving research and innovation. As new challenges need to be addressed, we move decisively with this fourth dimension from open access into the broader landscape of open science.

- **Do the right “think” and do it right:** The fifth dimension is ethics. European society is based on shared values. In order to adequately respond to societal
challenges, research and innovation must respect fundamental rights and the highest ethical standards. Beyond the mandatory legal aspects, this aims to ensure increased societal relevance and acceptability of research and innovation outcomes. Ethics should not be perceived as a constraint to research and innovation, but rather as a way of ensuring high-quality results.

– **Design science with and for society:** Policymakers also have a responsibility to anticipate and assess potential implications and societal expectations with regard to research and innovation, with the aim of fostering the design of inclusive and sustainable research and innovation. Through this last dimension we will develop harmonious governance models for responsible research and innovation that also integrate public engagement, gender equality, science education, open access/science, and ethics.

At European level, in 2015 Commissioner Moedas identified three strategic priorities, described in *Open Innovation, Open Science, Open to the World* (the three O’s strategy) (EC 2017:5) and this program, together with the perspective of opening science to citizens, responds to the fourth area of intervention of science diplomacy identified as *science and diplomacy for the people* (Galluccio and Vivani 2015:415). The Work Program 2018–2020 of Horizon 2020 has been designed to respond to these priorities by opening science to society and supporting the 3 O’s strategy through the implementation of five strategic directions (The European Commission 2017:6) oriented to the execution of the “Science with and for Society” (SwafS) challenge:

1. Accelerating and catalysing processes of institutional change
2. Stepping up the support to gender equality in Research and Innovation policy
3. Building the territorial dimension of SwafS partnerships
4. Exploring and supporting citizen science
5. Building the knowledge base for SwafS

Moreover, SwafS emphasizes the role of gender equality, science education, open access and data, and public engagement in RRI and the attractiveness of the research profession (EC 2017:7–8) to face global issues such as climate change, sustainable development, and biodiversity in an international cooperation with third countries. The main topics funded in the last round of Horizon 2020 respond completely to the previous requirements:²

- Open schooling and collaboration on science education
- Innovative methods for teaching ethics and research integrity
- Encouraging the reuse of research data generated by publicly funded research projects

²The complete list can be read on [http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-swafs-2018-2020.html#c.topics=callIdentifier/t/H2020-SwafS-2018-2020/1/1/default-group&callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/1/1/0/default-group#+identifier/desc](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-swafs-2018-2020.html#c.topics=callIdentifier/t/H2020-SwafS-2018-2020/1/1/default-group&callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/1/1/0/default-group#+identifier/desc).
• Grounding RRI practices in research and innovation funding and performing organizations
• Supporting research organizations to implement gender equality
• Exploring and supporting citizen science
• Taking stock and re-examining the role of science communication

The EU’s Strategy Under Commissioner Moedas

Commissioner Moedas has summarized the EU’s strategy for science diplomacy with his “three O’s” strategy: Open Innovation, Open Science, Open to the World. The Open Innovation is broadly associated with establishing a “Seal of Excellence” that can link Horizon 2020 and other funding programs to ensure high-quality initiatives, potentially leading to the establishment of a European Innovation Council. The European Innovation Council will become a full-fledged reality from 2021 with a proposed €10 billion budget under the next EU research and innovation program called Horizon Europe. This has been the first goal of the EU’s science diplomacy strategy given the logistical difficulties often faced in channelling Europe’s existing talent in a large-scale, quick, and effective manner. The second objective is Open Science and aims at establishing a European Open Science Cloud (EOSC) that allows for wider access to scientific data and research developed by Horizon 2020 initiatives. An engagement process was initiated with a first EOSC Summit in June 2017, producing the EOSC Declaration endorsed by more than 70 institutions. 3

Finally, Open to the World is about expanding the EU’s soft power and global weight in science, research, innovation, and technology in order to increase economic attractiveness and contribute towards facing the challenges of the international community (The European Commission 2016a, b). As we have previously stated, the EU has attempted to develop its presence and credibility in international affairs for several years, often resorting to soft power and implicitly science diplomacy. Policy-wise, science and technology are a shared competence between the EU and the member states. Horizon 2020’s €80 billion budget for the 2014–2020 period involved an important external component meant to advance the “three O’s” of the European Commission science diplomacy strategy. As stated by Commissioner Moedas in a 2015 speech given at the European Institute in Washington, DC, “Science Diplomacy [can] play a leading role in [the Union’s] global outreach for its uniting power”, referring to its long-known ability to build bridges between nations that have failed to establish more classical forms of diplomatic relations (collaboration with Russian scientists through Horizon 2020 being a contemporary example) (Balazs 2016). Moedas further delved into the strategic framework with which science diplomacy should operate in the EU’s foreign policy. Beyond his “three O’s” objectives he stated that self-interest (soft power) and global progress

3 https://ec.europa.eu/research/openscience/pdf/eosc_declaration.pdf.
(science for the people) should be placed in accordance to the foreign policy goals established in the Lisbon Treaty. Said objectives should be:

1. Using science and technology to improve regional security in the European neighbourhood
2. Using science and technology to improve the EU’s trade position in the global economy
3. Using science and technology to address international issues

With regard to the first objective, science diplomacy’s potential lies in the trust that it can generate between the EU and its neighbours by connecting their scientific communities. Science diplomacy should be a component of the EU’s peace and security strategy and be coordinated by both the EEAS and DG RTD. The second objective is tied to the EU’s normative power approach to international relations due to its focus on establishing global agendas on technical standards. Scientists and researchers influenced by European research can lead to regulations that benefit the EU’s comparative advantage in trade. DG Trade and DG RTD should coordinate efforts on this front. The third objective is an essential step for an effective “science for the people” approach to science diplomacy in the EU. Many of Horizon 2020 research initiatives focused on global issues such as health, demographic change, well-being, food security, energy, climate action, risk reduction, and security to name but a few. The EU should improve the program’s coordination and alignment with the United Nations’ sustainable development agenda. The EEAS should better coordinate efforts with other departments, such as DG RTD, and the member states’ diplomatic activities if coordinated can add process value to the progress on this front (Balazs 2016). One example of science diplomacy for the people—due to its impact on other international issues—is climate change and alternative energy sources. The EU has led by example with regard to emission reduction, decarbonization, and fight for ambitious international initiatives through effective multilateralism (see Part III in this book).

The Cutting-Edge Year: An Insight on the EU’s Actions

The EU has been very active in its global efforts to bridge divides and find common solutions to the issues of the international community and the year 2016 has been very important to this regard. During the World Economic Forum meeting in Davos (Switzerland) on 20–23 January 2016, the main theme was the Digital Revolution, but other topics were also present, such as the refugee crisis. Both the European Commission and the European Research Council (ERC) were represented during this event. Alongside then Commissioner Moedas was the then ERC President Jean-Pierre Bourguignon, 13 ERC grantees, and 2 Nobel laureates (Christopher Pissarides and Konstantin Novoselov). All members of the European delegation participated in the 16 discussions that were organized and stressed the importance of coordinating cutting-edge research on a global level. Partnerships in the Middle East were also
reinforced. On February 8, 2016, the European Commission and the Egyptian Ministry of Scientific Research established an “EU-Egypt Innovation Day” in the presence of Cristina Russo (Director for International Cooperation at DG RTD), Ambassador James Moran (Head of the EU Delegation to Egypt), and Dr. Essam Khamis (Deputy Minister of Scientific Research of Egypt). Three hundred stakeholders from different fields and positions were present, including researchers, academics, NGOs, SMEs, and institutional representatives and industrial and financial entrepreneurs. In addition to the EU and Egypt, Spain, France, Germany, Austria, Czech Republic, and the United Kingdom were also present and introduced their research and innovation programs to provide cooperation opportunities between European and Egyptian stakeholders. In addition to Egypt, the EU organized its second Joint Science and Technology (S&T) Coordination Committee (JSTCC) on 8 March 2016 with Algeria since both groups signed a cooperation agreement in 2012. Director Russo and Ali Mokrani (member of the Algerian Ministry of Foreign Affairs) co-chaired the meeting and discussed the priorities that the JSTCC should have. One of the priorities established was on the Commission’s High-Level Policy Dialogue (HLPD) with Africa as a part of the RINEA mobility scheme funded by Horizon 2020. HLPD will also further cooperation with regard to the Mediterranean Science, Policy, Research and Innovation (MEDSPRING) program also funded by Horizon 2020. Another meeting was organized on 9 March with the Algerian Ministry of High Education and Scientific Research to promote EU-Algerian Exchange programs in research and innovation through Horizon 2020 and the Euro-Mediterranean partnership (EUROMED).

In addition to the Middle East, the EU science diplomacy activities have also been fruitful in the Americas. The ERC organized its ninth annual meeting with the AAAS in Washington, DC on “Global Science Engagement” in the presence of the ERC President and the EU Ambassador (Mr. O’Sullivan) and discussed future collaboration prospects between European scientists and American counterparts in the National Institutes of Health (NIH) and the National Science Foundation (NSF). All of this was discussed within the topic “US-EU science outlook and the ERC perspective” and the meeting also included several Canadian participants, particularly due to their interest in pooling efforts to fight the Zika virus. Efforts to fight the Zika virus also led to a meeting on 26 January 2016 between the Brazilian Minister of Science, Technology and Innovation (Celso Pansera) and diplomats from the EU delegation in Brazil. The European delegation stressed the Union’s €10 million financial commitment in Horizon 2020 for Zika and microcephaly-related projects and priority-setting on the virus, its vectors, and programs for contaminated families. Brazil and the EU have also joined efforts for a call for proposals on advanced lignocellulosic biofuels on 9 March 2016, in order to reduce global reliance on fossil fuels and consequently fight climate change.

As we have highlighted above, Asia is another regional priority for the EU in its science diplomacy efforts. The European Commission and the Japanese Science and Technology Agency (JST) organized the third EU-Japan Joint S&T Committee meeting in May 2015 to develop co-funding mechanisms to increase cooperation between both polities, especially in innovation projects under Horizon 2020 that
combines universities, research institutes, SMEs, and other companies. The EU has also promoted the Chinese Co-funding Mechanism (CFM) in Shanghai and presented Horizon 2020 at Shanghai Jiao Tong University, sparking interest and dialogues with over 60 researchers, faculty members, and heads of department in one of the leading innovation universities in China. Local government officials were present in addition to European member states and industrial representatives. Co-funding mechanisms in Asia are also an important component of European Science Diplomacy’s strategy to fight climate change and improve the environment. The EU delegation to China, the Chinese Ministry for Environmental Protection, and the Chinese Research Academy for the Environmental Sciences (CRAES) organized a workshop called the “China-EU Workshop on Water and Air—Challenges and Opportunities” on 14–15 March 2016, in order to foster a bilateral dialogue between policymakers, scientists, and additional stakeholders on their approaches and strategies. Research, legislative frameworks, implementation, monitoring, cleansing, enforcement, and harmonization strategies were discussed, and further cooperation was envisaged.

The EU has been keen on using science diplomacy with its eastern neighbour given its delicate relations with Russia. The EU delegation in Russia and the then French Minister for the Economy, Industry and Digital Affairs (Emmanuel Macron) launched French Tech Hub Moscow on 25 January 2016, in the presence of entrepreneurs and companies from both countries. Established in New York and Tokyo, the French Tech initiative was developed to increase the attractiveness of France for talent and investments for knowledge-driven SMEs. Another initiative between Russia and the EU was the Helmholtz Winter Dialogues organized by Germany on 9 February 2016 in Moscow to allow German and Russian scientists to explore additional cooperation opportunities between both countries in the field of research and development.

March 10, 2016, was an important date for science diplomacy on the African continent because it was the anniversary of Bourguignon’s first visit as President of the ERC to promote African research at the Next Einstein Forum. In his speech he stressed the EU’s desire to develop mobility schemes between African and European researchers, academics, scientists, and policymakers in light of the “three O’s” principle of the European Commission’s science diplomacy strategy. To this end, the Open to the World “third O” has pushed the ERC to increase its diplomatic efforts to provide grants for nationals of third countries to conduct research in the EU or associated countries. Over 6400 research projects led by 66 nationalities have been funded thanks to the ERC’s efforts. In addition, around 17% of the ERC’s team members are non-European students, technicians, and researchers working for this body on short-term and medium-term initiatives. This allows the EU to benefit from talent abroad while developing human capital that will eventually return to third countries, thus creating a scenario whereby everybody gains from brain circulation (The European Commission 2016a, b). In addition, approximately €240 million has been spent by the Juncker’s Commission on emergency research for Ebola. Thirteen projects were launched as a result of these funds, leading to one of the most viable Ebola vaccines currently available. Both the European scientific community and
civil society have also been involved in sociocultural issues such as coping with the stigmatization of Ebola victims, especially orphans. Making it clear that international collaboration is essential in dealing with new and re-emerging diseases, Commissioner Moedas called for the Commission to develop a Global Research Collaboration for Infectious Disease Preparedness (GloPID-R) founded in 2013 (Moedas 2016). GloPID-R is the only alliance of its kind to bring together research funding organizations on a global scale to facilitate an effective and rapid research of a significant outbreak of a new or re-emerging infectious disease with epidemic and pandemic potential.4

Nowadays, the European Commission is coordinating a common EU’s response to the COVID-19 outbreak. It is taking action to reinforce the public health sectors and mitigate the socio-economic impact in the EU. The European Commission is mobilizing all means at its disposal to help member states coordinate their national responses and is providing objective information about the spread of the virus and effective efforts to contain it. The European Commission’s President von der Leyen has established a COVID-19 response team at political level to coordinate the response to the pandemic.5

More information on the COVID-19 outbreak, current actions, and related funding opportunities could be found on the European Research Area (ERA) corona platform.6

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4 https://www.glopid-r.org/.
5 https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response_en.
6 https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-hco-15-2019.