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From Shared Progress to Strategic Autonomy

The Transformation of Science Diplomacy in the European Union

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LIST OF ABBREVIATIONS

AAAS	American Association for the Advancement of Science
CERN	European Organization for Nuclear Research
DG RTD	Directorate-General for Research and Innovation
EC	European Commission
EEAS	European External Action Service
EL-CSID	European Leadership in Cultural, Science and Innovation Diplomacy
ERA	European Research Area
ESDC	European Science Diplomacy Conference
EU	European Union
EUSDA	European Union Science Diplomacy Alliance
FP7	Seventh Framework Programme
GESDA	Geneva Science and Diplomacy Anticipator
InsSciDE	Inventing a Shared Science Diplomacy for Europe
IPR	Intellectual Property Rights
JRC	Joint Research Centre
MS	Member States
R&I	Research and Innovation
S&T	Science and Technology
S4D4C	Using Science for/in Diplomacy for Addressing Global Challenges
SD	Science Diplomacy
SFIC	Strategic Forum for International S&T Cooperation
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States

1. INTRODUCTION: PURPOSE AND MOTIVATION

Science, technology and international affairs have become inextricably linked. Scientific knowledge allows states to make better-informed and more effective foreign policy decisions, from climate change to public health. Science also plays a central role in defense and national security, where technological advantage has historically determined the balance of power. At the same time, science is a field of collaboration, where experts from across the world come together to drive innovation forward and develop solutions to shared global challenges. This dual nature of science, at the same time a space for cooperation and competition (Ruffini, 2020a), makes it a key dimension of international politics and has prompted the rise of science diplomacy as a growing field. The intersection between science, diplomacy and public policy is the central motivation of this work.

Over the past 15 years, science diplomacy has undergone a profound transformation. The optimistic, multilateral environment that influenced its early conceptualization has given way to a fragmented global landscape, where science and technology, once thought to be mainly a tool for universal cooperation, have now also become a source of rivalry. The recent report by the Royal Society and the American Association for the Advancement of Science (AAAS), *Science Diplomacy in an Era of Disruption* (2025), argues that we now live in a more fragmented, competitive and unstable environment, where science and technology are both tools of cooperation and sources of geopolitical tension, from advances in artificial intelligence, semiconductors, or quantum computing to biotechnology. The UNESCO Global Ministerial Dialogue on Science Diplomacy, held in March 2025, explored the critical role of science diplomacy in navigating this fractured geopolitical landscape (UNESCO, 2025), showing its growing prominence on the global stage. In addition, the nature of the key players has become more diverse, with non-state actors, mainly global technology companies, increasingly using science diplomacy to pursue their own objectives.

The European Union (EU) has responded to this changing global landscape through a gradual redefinition of its science diplomacy: from a solely cooperative project based on shared progress to a strategic instrument which increasingly values autonomy, protection and influence. This reflects a broader turn towards a “post naïve” science diplomacy (Olšáková & Robinson, 2022), recognizing that the role of science in foreign policy has moved beyond that of a soft-power tool alone. This gradual evolution of EU

science diplomacy, from individual initiatives into a structured framework that guides Europe's foreign policy, is visible in documents such as *Open Innovation, Open Science, Open to the World* (EC, 2016), the *Global Approach to Research and Innovation* (EC, 2021), or the *European Framework for Science Diplomacy* (EC, 2025). The latter reflects the 2024–2029 Political Guidelines for the European Commission (EC), which call for Europe to be "more assertive in pursuing its strategic interests in an age of geostrategic rivalries" (EC, 2025, p. 5). Science diplomacy, as the report argues, must not only promote European values but also secure technological sovereignty and strategic interests, functioning both as a form of soft and hard power.

This thesis investigates how EU science diplomacy has been framed over time, and how it positions openness and cooperation in relation to autonomy and protection in its external policy. To do this, the study draws on an interpretive approach, analyzing a corpus of fourteen primary sources, including institutional and institutionally mandated documents spanning 2012–2026. It examines whether the EU is attempting to maintain its core values of openness and cooperation even as it strengthens its autonomy and ability to act strategically, and the role science diplomacy plays within this logic.

2. STATE OF THE ART AND THEORETICAL FRAMEWORK

This chapter seeks to offer a comprehensive review of the current state of the art on the topic of science diplomacy and to clarify its conceptual framework. It begins by defining science diplomacy, exploring the origins of the field and the evolving typologies and debates surrounding the term. It then explores the diverging views on the role and motivations of science diplomacy, focusing on its dual nature of cooperation and competition, and of soft and hard power. The focus will then be placed on the changing geopolitical and technological landscape in which science diplomacy operates, and on the paradigm shifts this has prompted. Finally, the specific situation of science diplomacy in the EU is explored, tracing its origins and key actors, as well as the gap this project addresses.

2.1. Defining Science Diplomacy: Origins and Conceptual Basis

2.1.1. Historical Foundations: The Emergence of Science Diplomacy

Although the term 'science diplomacy' became a "buzzword" in the early twenty-first century (Turchetti et al., 2020, p. 325), the practices it describes have a longer history and are often referred to as "*avant-la-lettre*" (Turchetti, 2020, p. 414; EC, 2025, p. 16) or "proto" science diplomacy (Flink & Rüffin, 2019, p. 106). States have long used scientific exchange and expertise to advance their foreign policy objectives, using scientific relations as a bridge when other channels were unavailable. This is especially visible across the post-war and Cold War era, when scientific exchanges and initiatives became less scientist-led and spontaneous, and more state-led and bureaucratic (Crawford et al., 1993, pp. 23–24) due to the integration of science into formal national security and foreign policy agendas. Among key examples during this time are the founding of the European Organization for Nuclear Research (CERN) (1954), the creation of the International Atomic Energy Agency (IAEA) (1957) or the signing of the Antarctic Treaty (1959), all of which served as key points of connection between adversaries when political relations were strained. However, science diplomacy is argued to have become a genuinely global phenomenon only in the early 1970s, with the emergence of Global South states and their growing role in international technoscientific affairs, particularly within the United Nations system (Robinson et al., 2023).

It is in the mid-2000s that science diplomacy was recognized as a formalized field. There is a growing awareness that the defining challenges of the century, including climate change, food insecurity, or nuclear proliferation, all possess scientific dimensions and could not be resolved by any single nation acting alone (Royal Society & AAAS, 2010, p. v). Science diplomacy's main role is no longer solely to be a bridge to diplomatic dialogue, but rather for science to serve as the basis for tackling global challenges in a coordinated way. In the foreign policy and diplomacy sphere, science and technology start to become more institutionalized. In 2000, the United States was the pioneer in establishing a position of Science and Technology Adviser to the Secretary of State, a strategy that has since been adopted by multiple other nations which have also put in place their own scientific advisory mechanisms in their foreign ministries (Turekian, 2018, p. 7).

Scholars also express a revived interest in science diplomacy and its potential during this period (Lord & Turekian, 2007; Fedoroff, 2009). Lord and Turekian (2007) were

among the first to explicitly call for a revisiting of science diplomacy, arguing that "it was time to adopt science diplomacy for a new era" (p. 769). Within this context, the AAAS increased its focus on science diplomacy by creating the AAAS Center for Science Diplomacy in 2008. A year later, the Royal Society and the AAAS held a joint conference, whose proceedings would result in the field's foundational reference: the report *New frontiers in science diplomacy – Navigating the changing balance of power* (2010). The *Science & Diplomacy* open-access journal, launched in 2012 by the AAAS Center, consolidated this framework as the field's primary publication venue (Turekian, 2018).

2.1.2. Conceptual Basis of the Term: Evolving Typologies and Debates

Science diplomacy can be initially approached as the fusion of two separate elements: science and diplomacy. To begin with, science can be defined as an evidence-based form of knowledge acquisition founded on empirical methods and the repeated verification of results (Turekian et al., 2012, p. 4). In the context of science diplomacy, this term encompasses not only the natural sciences, but also fields such as engineering, technology, medicine and the social sciences (Royal Society & AAAS, 2025, p. 8). Diplomacy, on the other hand, refers to the non-violent management of international relations through dialogue, negotiation and compromise, primarily serving as an instrument of sovereign states to pursue national or institutional interests (Turekian et al., 2012; Royal Society & AAAS, 2025). While diplomacy traditionally focuses on the pursuit of state interest, it also involves the pursuit of global interests by international organizations (EC, 2025).

The concept of science diplomacy itself has been defined in many ways, and there is no uncontested definition. It is understood to be an umbrella term which includes sub-fields such as climate diplomacy, digital diplomacy, ocean diplomacy or space diplomacy (Royal Society & AAAS, 2025). As identified in the previous point, the first generally accepted comprehensive framework of science diplomacy was the one developed in the Royal Society & AAAS (2010) report, which argued that science diplomacy involves three fundamental pillars or types of activities (p. vi):

- Science in Diplomacy: the use of scientific advice to inform foreign policy objectives.

- Diplomacy for Science: the use of diplomatic mechanisms to facilitate international science cooperation.
- Science for Diplomacy: the use of science cooperation as a tool to improve international relations between countries.

'Science in diplomacy' is explored through examples such as the Intergovernmental Panel on Climate Change, non-proliferation agreements or economic and financial agreements such as the Bretton Woods system (EC, 2025, p. 16). Davis and Patman (2012) argue that science diplomacy has been particularly successful in the area of 'diplomacy for science', with key examples where diplomacy has helped establish "large-scale international science projects" such as the International Space Station or the Large Hadron Collider (pp. 266–267). When concretely exploring EU science diplomacy, López de san Román and Schunz (2018) contend that the EU has paid special attention and attempted to reinforce 'science for diplomacy' and 'diplomacy for science', introducing the term 'science for economic diplomacy' as a practice that has the potential to promote the EU's economic competitiveness (p. 259).

While the Royal Society & AAAS (2010) tripartite framework has become the dominant reference point in science diplomacy discussions, it has also received many critiques over the years. Gluckman et al. (2017) address the weaknesses of the traditional taxonomy and its three-dimension division[1], highlighting that while it may be useful for academic discussions, it has limitations in practical application for government agencies. The main argument is that many international science efforts serve multiple purposes at the same time, making it hard to categorize them solely within one of the three pillars proposed by the 2010 Report (Gluckman et al., 2017, p. 2). Fägersten (2022) shares this critique of the practical applications of the 2010 taxonomy, arguing that this framework does not focus on the motivations or goals of actors and thus can make limited contributions to the guiding of strategy and policy (p. 6).

In order to address these limitations, alternative typologies and ways of approaching the concept of science diplomacy have been proposed. Gluckman et al. (2017) put forward a taxonomy divided into three new categories according to a country's intervention logic and motivation: actions designed to directly advance a country's national needs, actions designed to address cross-border interests, and actions designed to meet global needs and

[1] Science in diplomacy, diplomacy for science and science for diplomacy.

challenges (p. 12; see Appendix C, Figure C1 for the complete taxonomy). A key recent change in the 2010 typology comes from the creators of the original model themselves. Fifteen years after the first report was published, the Royal Society and AAAS (2025) published the report *Science diplomacy in an era of disruption*. Taking into account the critiques advanced against the initial model, the need to re-examine the 2010 report is recognized. A revised framework is put forward seeking to simplify the tripartite taxonomy (science in diplomacy, diplomacy for science, and science for diplomacy) in order to reduce confusion and to facilitate its practical application in an increasingly divided and complex global landscape. The new framework proposes the division of science diplomacy into two dimensions: science impacting diplomacy, and diplomacy impacting science (Royal Society & AAAS, 2025, p. 24). The new model does not try to assert that there are only two ways for the fields to interact, but rather to favor a new approach that is more flexible and adaptable to the current era characterized by constant changes in the scientific and geopolitical spheres.

While it is important to explore what science diplomacy is, it is equally important to define what it is not. The term has become subject to "mission creep" (Royal Society & AAAS, 2025, p. 8), making it essential to maintain the analytical value of the concept. Science diplomacy is not everything involving science and international affairs. As the Royal Society & AAAS (2025) report conveys "if science diplomacy is everything, it is nothing" (p. 11). Calling every international meeting or collaboration science diplomacy can obscure the term and drain it of any real meaning. This is one of the critiques advanced by Flink and Rüffin (2019), who suggest that, despite its discursive perseverance, science diplomacy has become a "floating signifier" that gathers context-specific meanings, allowing for many actors to label their activities as science diplomacy (p. 110).

The literature mainly points to the need to differentiate between science diplomacy and international science cooperation, terms that are sometimes used interchangeably (Turekian et al., 2012; Ruffini, 2018). While they overlap, science diplomacy and international scientific cooperation need to be understood as analytically different concepts. Science cooperation is primarily concerned with the advancement of knowledge and discovery for its own sake, while science diplomacy leverages science to support broader foreign policy objectives or state interests (Turekian et al., 2012, p. 6). As Ruffini (2020a) argues, scientific cooperation often lacks the diplomatic dimension, as institutions can cooperate without the interests of states being necessarily at stake (p. 374).

Given the absence of a settled definition of science diplomacy, this work does not privilege one definition over the others. In fact, the shifting definitions within the corpus are themselves part of what this work analyzes. However, as a working point of departure, science diplomacy is explored here in relation to Ruffini's (2020a) proposed approach to the term, describing the essence of science diplomacy as a balance "between the idealism of science and the realism of diplomacy, between international co-operation for the common good and competition driven by national interests" (p. 372). This points to the strategic dimension of science diplomacy and to the intersection of scientific and foreign policy interests, central to the tension between cooperation and protection this study sets out to explore, and which is further examined in the next section.

2.2. The Duality of Science Diplomacy: Cooperation and Competition

Science diplomacy is characterized by a fundamental duality, as it operates through the twofold logic of collaboration and competition (Ruffini, 2020a). While these two dimensions are often presented as opposites, they can coexist and overlap within science diplomacy strategies. Two main views are present in the literature: a cooperation-oriented view and a competition-oriented realpolitik perspective (EC, 2025, p. 18).

The cooperation-oriented/globalist view argues that science serves as a universal language that can build bridges between nations even when formal relations are strained (Royal Society & AAAS, 2010; Fedoroff, 2009; Moedas, 2016). Science is perceived as a non-ideological tool for the global common good, and its objectivity is seen as necessary to address global challenges. In this model, also referred to as the 'aspirational model' (Turekian & Gluckman, 2025), science diplomacy acts as a catalyst of soft power, persuading through shared values. This model was prominent in the period when the concept of science diplomacy emerged and was characterized by a logic of optimism. For example, Nina Fedoroff (2009), the then Science and Technology Adviser to the U.S. Secretaries of State, defined science diplomacy as "the use of scientific collaboration among nations to address the common problems facing 21st century humanity and to build constructive international partnerships" (p. 9). This logic points mainly to the capacity of science diplomacy to build bridges and promote cooperation between states.

On the other hand, the competition-based/statist view regards science and technology as instruments to achieve national foreign and security interests (Fägersten, 2022;

Gluckman et al., 2017; Ruffini, 2020a; Rungius & Flink, 2020). It contends that science diplomacy is not just about cooperation, but that it is also embedded in a logic of competition. This is evident in the instrumental approach to science diplomacy as "the use of science for foreign policy purposes" (Fägersten, 2022, p. 5). Unlike collaborative science diplomacy, which is a "positive-sum game" based on shared interests, competitive science diplomacy often operates as a "zero-sum game" where resources gained by one actor are perceived as a loss for another (Ruffini, 2020a, p. 379). Rüffin and Rüland (2022) analyze this logic in the Arctic, exploring how one state's gains in Arctic science are another's loss (p. 7).

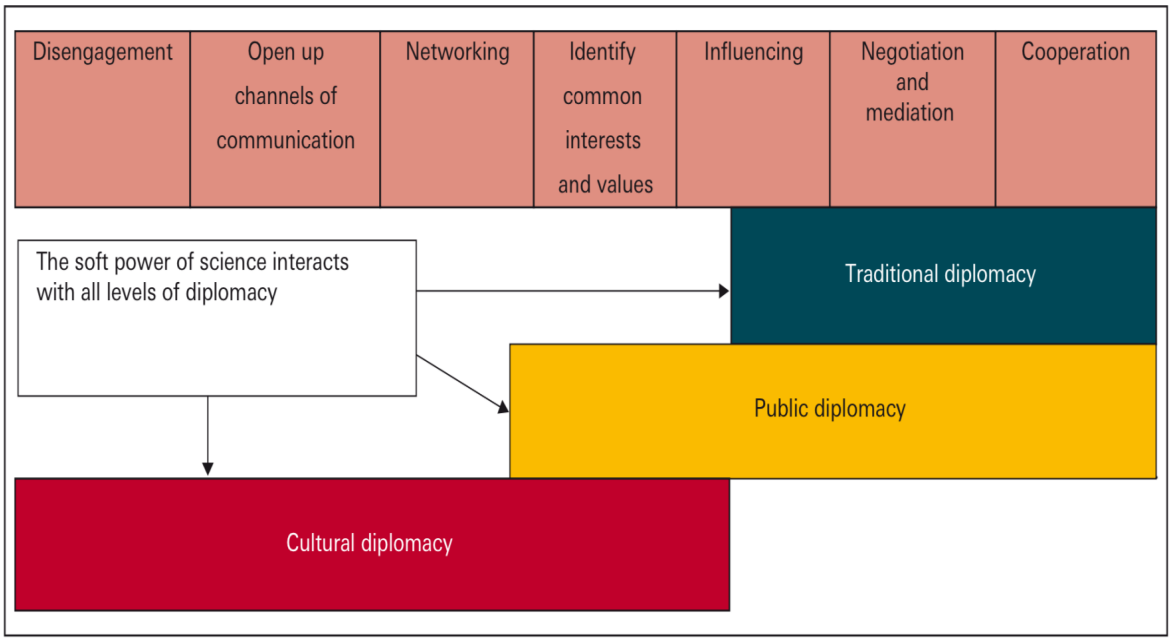
While competition may seem initially at odds with diplomacy's essence of dialogue and mutuality, it is embedded within policy documents that frame states' science diplomacy strategies and also present in its practices (Ruffini, 2020b, p. 5). In spite of this, the rationale of competition is underrepresented in the mainstream discourse on science diplomacy, and the "good-naturedness" of science diplomacy is rarely questioned (Flink, 2020, p. 367). Rungius & Flink (2020) find that science diplomacy rests on "romanticized ideals and misconceptions" (p. 2), and argue that the main discourse in the field portrays science as inherently good or collaborative, creating a myth of science that can mask self-interested power-politics and the reality of science as a competitive field.

As the EC (2025) points out, while the cooperation-focused approach has dominated the concept of science diplomacy for the last decade, the competition-focused approach has gained strength recently (p. 20). It is also important to note that both views are not mutually exclusive, as cooperation and competition can coexist. This is particularly evident in the EU's pursuit of 'open strategic autonomy', which aims to reconcile the traditional EU commitment to open science and the need for protectionism and research security (EC, 2025). The integration of both approaches is perceived as a necessary response to a more fragmented global landscape. Following this logic, Turekian and Gluckman (2025) call for a "rewiring" of science diplomacy, that integrates three approaches – aspirational, pragmatic and transactional– in order to take advantage of the strengths presented by each (p. 761).

It is also relevant to explore how this dual nature of science diplomacy relates to the idea of power. The typology presented in the 2010 report linked science diplomacy to Joseph Nye's (2004) concept of 'soft power', the ability to influence others through attraction and reputation rather than coercion. Figure 1 shows the ways in which the soft power of science interacts with international relations and diplomacy (Royal Society &

AAAS, 2010, p. 11). This relationship between science diplomacy and soft power has been dominant in the field over the years, with the more recent Royal Society & AAAS (2025) report also alluding to the use of international scientific cooperation, one of the activities within science diplomacy, as a powerful expression of soft power (p. 20). Turekian et al. (2012) also identify science diplomacy as a "significant generator of soft power" (p. 5), focusing concretely on the way 'science for diplomacy' draws on the soft power of science through its "attractiveness and influence" (p. 18).

Figure 1. *The soft power of science as presented in the 'New Frontiers' Report.* [2]



However, it is key to recognize that science and technology have historically also been used as tools of hard power, mainly in the military and economic fields (Domingues & Ribeiro, 2018, p. 611). While the soft power dimension of science diplomacy is still recognized and predominant, new 'hard power' perspectives of science diplomacy have appeared in recent years. Zaika & Lagutina (2023) explore this through the lens of Arctic science diplomacy, arguing that there has been a shift from 'soft' power representing global interests, to 'hard' power representing national interests, with 'hard dialogue' tools becoming more common in the current geopolitical landscape (p. 5). Müller (2024) points out that the "race for new and disruptive technologies" has led to the use of science

[2] From *New frontiers in science diplomacy: Navigating the changing balance of power*, by Royal Society and American Association for the Advancement of Science, 2010, p.11.

diplomacy not only as a tool of soft power but also of hard power (par. 2), a trend that has affected the European context. These contributions suggest that while science diplomacy is still mainly framed as a soft power instrument, its hard power dimensions are becoming harder to ignore. This shift is, to an extent, a reaction to a changing geopolitical and technological landscape, that has reshaped science diplomacy globally, and increasingly within the EU.

2.3. Paradigm Shifts: Geopolitical and Technological Landscape

The evolution of science diplomacy is deeply linked to the transformation of the landscape in which it operates. Ronda-Pupo (2025) identifies four interconnected drivers that have shaped the field's recent development: global crises and transnational challenges, technological advancements, geopolitical shifts and disruptors, and soft power and global governance (p. 18). The most visible of these is the growing geopolitical fragmentation, which has prompted the global landscape of research and innovation to undergo fundamental shifts. Nowadays, cross border partnerships are becoming more complicated, especially in key fields such as AI, quantum computing and biotechnology, as actors increasingly seek to secure their own advantages and try to defend themselves against the risks of dependence on others (Geneva Science and Diplomacy Anticipator, 2026, p. 212). These geopolitical shifts are making the role of S&T as instruments of power increasingly apparent. States are now using S&T for non-collaborative, restrictive foreign policy objectives, as Luo and Van Assche (2023) show in the US through the example of the CHIPS and Science Act, whose "expressly geopolitical purpose" seeks the containment of rival powers through protective "guardrail provisions" (p. 1426). Research security has also become a key concern, and its protectionist nature has led the field of science diplomacy to question whether it is "a constraint that inhibits science diplomacy" or if it can also be an "enabling force" that clarifies its role and importance (Dawes et al., 2024, para. 2).

Within the EU, this changing environment has driven a broader turn towards the language of 'strategic autonomy'. As Csernatoni (2022) points out, terms like 'strategic autonomy' and 'technological sovereignty', traditionally used at the national level, have gained traction in the EU in recent years. The EU is increasingly using this vocabulary as it tries to adapt to the changing geopolitical and technological landscape and reduce its

dependencies on other powers. The COVID-19 crisis served as a turning point by exposing large EU dependencies in strategic sectors, leading to the need for an approach to industrial policy centered on technological sovereignty (Crespi et al., 2021). What initially began as a logic mainly present in EU defense discourse has gradually widened to encompass economic, health, digital and R&I dimensions.

For the purpose of this work, it is important to explore how this logic has infiltrated R&I policy in the EU. Over recent years, there has been a growing recognition that the long-time European commitment to openness is being challenged (Huang & Soete, 2025; Bamberger & Huang, 2025; Soete & Burgelman, 2023). Bamberger & Huang (2025) argue that the EU's approach to international scientific collaboration has undergone a fundamental shift from a liberal agenda of "openness" to an approach of "selective closure" and protectionism (p. 34), in which the EU has begun to emphasize sovereignty, autonomy and reciprocity, implementing strategic autonomy in international research cooperation in order to safeguard its own research interests (pp. 30–32). Soete and Burgelman (2023) see this shift as a gradual one, in which discourse increasingly revolves around academic freedom, sovereignty and foreign interference. They argue that the notion of 'strategic autonomy' points to the "(re)bordering" of EU research in response to perceived threats to its economic stability and security (p. 31).

This perceived protective turn has opened a debate on whether the EU can remain open while also pursuing strategic autonomy and protection. The two are not necessarily incompatible. Huang and Soete (2025) argue that a country can pursue open science and sovereignty at the same time (p. 12). However, while the EU is shifting towards technological sovereignty as a response to geopolitical crises, it must keep openness as its core value (Soete & Burgelman, 2023). The EU has tried to reconcile these two dimensions through the concept of 'open strategic autonomy', although the "implicit policy oxymoron" within the concept remains unresolved (Soete & Burgelman, 2023, p. 7).

EU science diplomacy has been directly affected by this strategic turn, which makes the debate between openness and autonomy central to the field. The next section looks briefly into how EU science diplomacy has evolved and the main actors at play.

2.4. Science Diplomacy in the EU

2.4.1. Brief Evolution of Science Diplomacy in the EU

Although 'science diplomacy' only arose as a term quite recently, scientific cooperation was key in the European integration process from the beginning. The establishment of CERN (1954) and the creation of the Joint Research Centre (JRC) in 1957 through the EURATOM Treaty represent early international examples of the use of science to foster relations in the region (EC, 2025). International cooperation has been part of the EU's institutional agenda since the 1986 Single European Act formally recognized it as a key activity of the Union's research policy (EC, 2012). From there, the Framework Programs gradually became the EU's main vehicle for cross-border scientific engagement. However, at the time, there was still a lack of strategy when it came to the use of science and technology as a coherent diplomatic tool. A major turning point occurred with the 2008 Commission Communication *A strategic European framework for international S&T cooperation*, which provided the first long-term structure for the Union's international scientific activities (López de san Román, & Schunz, 2018, p. 248).

The term 'science diplomacy' was first used in an official EU policy document in the 2012 Commission Communication *Enhancing and focusing EU international cooperation in research and innovation* (EC, 2012, p. 4). A few years later, in 2015, former EU Commissioner for Research and Innovation Carlos Moedas expressed the need for science diplomacy to become a priority in the Commission's policymaking, being the first to explicitly introduce the concept to EU strategy (EC, 2016). Moedas (2016) centered his mandate around the "Three O's": open innovation, open science, open to the world, which led to the exploration of the term "open science diplomacy" (Mayer, 2020).

By 2017, a Commission-led study concluded that EU efforts in the field still lacked a coherent and comprehensive strategy, and called for a more structured approach (Van Langenhove, 2017, p. 26). In the following years, the EU funded three Horizon 2020 projects on science diplomacy–EL-CSID, InsSciDE, and S4D4C– which improved understanding of European science diplomacy and developed a thorough scholarly basis. This was the first comprehensive attempt at mapping science diplomacy practices in the EU context, showing the growing interest in the field within EU policy.

In July 2023, EU Research Ministers discussed science diplomacy for the first time at the European level at the Competitiveness Council in Santander, asking for an ambitious

European framework to improve coordination (Müller, 2024). This led to a bottom-up creation process involving 130 experts from both the scientific and diplomatic communities. In February 2025, the report *A European Framework for Science Diplomacy* was published (EC, 2025). Building on this expert input, the Commission put forward a proposal for a Council Recommendation in February 2026 (EC, 2026b), which the Council is set to adopt in May 2026 (Council of the EU, 2026a).

2.4.2. Actors and Institutions in EU Science Diplomacy

It is important to understand that, when it comes to science diplomacy in Europe, a wide variety of actors interact. As Rüffin (2020) argues, science diplomacy in the EU operates within the framework of multi-level governance (MLG), where authority is shared between institutions and the sovereign Member States (MS).

When it comes to EU institutions, the main driver of science diplomacy is, at the moment, the European Commission. Concretely, Flink & Rüffin (2019) point out that the actual driving force of EU science diplomacy is the Commission's DG RTD (p. 115). On the diplomatic level, the EEAS acts as the principal partner. For example, it appointed its first Science & Technology Advisor in 2020 to address the gap between diplomacy and technical expertise (Fägersten, 2022, p. 19). However, science diplomacy remains a relatively new topic in the EEAS compared to the well-established international engagement of DG RTD when it comes to S&T and R&I.

The EU must provide complementarity or added value through the facilitation of multilateral cooperation and large-scale agreements on behalf of the bloc, while always respecting the principle of subsidiarity and the sovereign rights of MS regarding national science policy and programs (Rüffin, 2020, p. 3). There have been recent attempts to evolve towards a more unified European approach, exemplified by the proposal for an EU Framework for Science Diplomacy. According to this report, key players include scientists, diplomats, institutions and intermediary actors. Figure 2 describes the main actors involved in science diplomacy, with the orange sections being dedicated to the main actors, while the white ones represent intermediaries (EC, 2025, p. 30).

These intermediary actors play a key role. The EU Science Diplomacy Alliance (EUSDA), created in 2021 by the three Horizon 2020 science diplomacy projects[3], has

[3] EL-CSID, InsSciDE, and S4D4C.

also played a major role over the past 5 years helping bridge the worlds of science and diplomacy and emerging as the "main epistemic community" in Europe, bringing together around 40 institutions in the EU as well as global networking partners abroad (EC, 2025, p. 28). Advisory bodies such as the Strategic Forum for International S&T Cooperation (SFIC) have worked to align EU and Member State international research policies, and has been a key contributor to shaping the EU science diplomacy agenda.

***Figure 2**. Main actors involved in European science diplomacy.*[4]

This variety of actors shapes the field of European science diplomacy, showing the constant interaction between EU institutions, MS and the expert community to contribute to its development.

[4] From *A European Framework for Science Diplomacy*, by European Commission, 2025, p. 30.

2.5. Research Gap and Justification

This thesis is mainly concerned with how EU science diplomacy has changed over time, specifically, with the shift from a vision focused on openness and multilateral cooperation toward one increasingly shaped by protection and strategic autonomy. The evolution of EU science diplomacy has been traced (Moedas, 2016; Van Langenhove, 2017; López de san Román & Schunz, 2018; Rüffin, 2020; EC, 2025), but less attention has been paid to the evolution of its framing, objectives, and function as an instrument of power. Similarly, existing literature has explored the EU's turn towards strategic autonomy and technological sovereignty in R&I policy, approaching it as a shift from openness towards protectionism (Csernatoni, 2022; Bamberger & Huang, 2025; Soete & Burgelman, 2023), but without focusing on how this turn towards a more protectionist logic has affected science diplomacy specifically. This shift is real and broadly established in the literature, but what remains less explored is what it means for the EU's identity as a science diplomacy actor. The question remains whether openness has been left behind, or whether it is being adjusted to coexist with a more protective logic, and if so, in what ways. The following objectives and research questions are designed to address this gap.

3. RESEARCH GOALS AND QUESTIONS

Based on the previously explained research gap, this thesis pursues two main objectives. The first is to trace the discursive evolution of EU science diplomacy across institutional and institutionally mandated documents from 2012 to 2026, examining how its definition, objectives and function as an instrument of power in EU foreign policy shift across the period. The second goal is to determine how EU documents frame the relationship between openness and cooperation on the one hand and protection and autonomy on the other, and the relative importance each is given.

In order to pursue these objectives, the thesis addresses the following two research questions:

> **RQ1**: How has EU science diplomacy discourse, as expressed across institutional and institutionally mandated documents, evolved between 2012 and 2026?

RQ2: To what extent does the growing logic of protection and strategic autonomy represent a departure from (or a reframing of) the EU's foundational commitment to openness and cooperation in research and innovation?

Each research question is approached through additional guiding sub-questions which provide a further layer to the analysis. Two sub-questions accompany RQ1: How have EU institutional documents framed science diplomacy, its objectives, and its underlying values? In what ways does EU discourse position science diplomacy as a tool of soft power, hard power, or a combination of the two, and how does this positioning shift over time?

Two further sub-questions help operationalize RQ2: Does EU science diplomacy discourse treat openness and protection as equally weighted priorities, or does one consistently prevail over the other? What internal and external factors (if any) do EU documents invoke to justify the turn toward a more protective, autonomy-oriented approach?

These questions are examined through a four-phase periodization of the 2012–2026 corpus, detailed in the next section.

4. METHODOLOGY

This thesis employs a qualitative document analysis built on an interpretive research design as articulated by Schwartz-Shea & Yanow (2012). EU official documents are treated not as neutral descriptions of science diplomacy but as constructive texts that actively frame issues, actors and objectives. This idea comes from the interpretive understanding that language "plays a role in shaping or 'constituting' understandings of [the] world", rather than only mirroring it (Schwartz-Shea & Yanow, 2012, p. 43), and as a result, policy documents should be read as "text analogues" (p. 6), recognizing that meanings are intertwined with the moment of their creation.

The choice of methodology comes directly from the nature of the main research questions. The primary analytical interest is how these documents conceptualize science diplomacy, the values they invoke, the threats they name, the objectives they prioritize, and most importantly what changes can be perceived across time. This focus on shifting meanings over time makes contextuality a guiding principle in the analysis, rather than

‘generalizability’ (Schwartz-Shea & Yanow, 2012, p. 48). It is understood that each document needs to be read within its specific institutional and geopolitical context, which is why the corpus is organized in different analytical phases through periodization.

In practice, the analysis follows an abductive logic, beginning with a puzzle or tension and then seeking to explain it in ways that make it more normal or natural (Schwartz-Shea & Yanow, 2012, p. 29). The analysis moves between the corpus and the secondary literature on science diplomacy to make sense of the tension between the EU’s cooperative image and its turn towards a logic of protection and autonomy in the field. Intertextuality becomes key, as earlier documents in the corpus are read in light of later ones and vice versa, so that shifts in framing, vocabulary and importance become visible across the different phases (Schwartz-Shea & Yanow, 2012, pp. 85–86).

The empirical basis is a corpus of fourteen primary sources (documents and policy-relevant events) spanning 2008–2026. The sources include EU policy documents, institutional texts, expert reports and EU-funded project outputs, and together they show how the EU constructs science diplomacy and how that construction changes over time. The aim is not to be exhaustive, but to identify discursive turning points, moments in which EU official language, priorities and justifications reorient.

The choice to start in 2008 comes from the need to adress the time period that predates the formal appearance of ‘science diplomacy’ as a term in EU institutional language. This will allow a better appreciation of the framing shifts that follow. The endpoint (2026) is justified by the recent publication of the *Council Recommendation on a European Union framework for science diplomacy* (Council of the EU, 2026b), which consolidates the previous framework-building efforts and provides a natural closure to the trajectory analyzed in this thesis.

The corpus is organized into a baseline section and four analytical phases. There is no intention to claim abrupt breaks, as the goal is to make visible shifts in policy logic that often take place gradually. While one may be tempted to follow the Framework Programme timeline (FP7, Horizon 2020, Horizon Europe), it would be analytically misleading for the purpose of this work. Political and discursive shifts often occur mid-program as a response to global disruptions that are not necessarily related to administrative funding cycles. For example, the move towards conditionality and reciprocity in 2021 was a result of geopolitical developments, and not of the launch of Horizon Europe. For this reason, periodization used in this thesis is based on identifiable shifts in the EU’s policy logic in discourse related to science diplomacy:

- Baseline (pre-2012): explores the initial EU framing of international S&T before science diplomacy became part of its vocabulary and serves as a necessary introduction to the four main phases.
- Phase 1 (2012–2014) begins with the first document to use the term, and where science diplomacy enters EU policy as a tool of soft power.
- Phase 2 (2015–2020) is defined by the rise of 'openness' as the EU's dominant normative framework.
- Phase 3 (2021–2022) marks a turning point, where the language of conditionality, reciprocity and strategic interests enters the EU discourse and gains relevance.
- Finally, phase 4 (2023–2026) explores the creation of a European framework for science diplomacy and its consolidation, culminating in the 2026 Council Recommendation.

A visual overview of the corpus alongside relevant EU institutional and external events can be found in Appendix B (Figures B1 and B2). These timelines are non-exhaustive, and the goal is not to argue that only these specific events are relevant for the understanding of the evolution of science diplomacy in the EU. There is also no intention of claiming a causal relationship between the events taking place and the possible shifts observed in the analysis. However, it is useful to see some key events that were occurring at the time the corpus sources were created.

To avoid treating all texts as if they have the same authority, the corpus is grouped in two categories based on who produced them and what role they play in EU policymaking. Both institutional and semi-institutional documents have been selected, as the EU's science diplomacy discourse is co-produced across these registers. The analysis treats both categories as primary sources, since EU science diplomacy is shaped both by institutional outputs and by the knowledge production of experts and projects the EU itself commissions. To reflect differences in origin, the corpus is divided as follows:

- Category A: Official EU Institutional Documents

  Commission Communications, Council Conclusions and Recommendations, Commission reports, and legislative proposals.
- Category B: EU-Funded, Mandated, Commissioned, or Organized (policy-shaping inputs)
  - Expert reports commissioned by EU bodies, outputs from EU-funded research projects, advisory papers from bodies such as the SFIC, and

proceedings from conferences organized with EU institutional involvement.

Within these two categories, external expert input not directly linked to EU institutions is used as secondary literature to support the findings in the primary corpus sources. These documents are key for tracing the interaction between external environment and EU institutions, and to avoid reading EU texts in isolation.

Sources were selected by working backwards in time, taking *A European Framework for Science Diplomacy* (EC, 2025) as the main entry document. This document was chosen for two reasons. First, it is the most comprehensive EU document on science diplomacy to date. Second, it puts forward the EU's own account of how the field has developed, citing earlier documents and events along the way. These references provided an initial set of sources, and each of them in turn pointed back to those it cited, allowing the corpus to be built through the intertextual links the EU itself draws between its texts. Every primary source chosen is referenced as key in at least one other, the only exception being the most recent 2026 Council Recommendation which closes the chain. The corpus combines science diplomacy-specific documents and texts within which science diplomacy is embedded but not necessarily the main focus, allowing the broader context in which science diplomacy operates to be explored, as it affects how the term is understood.

5. ANALYSIS AND DISCUSSION

The analysis opens with a baseline section on the pre-2012 period, which is used to situate the EU's S&T framing before the term 'science diplomacy' became popular. Each of the four phases will be approached in the same way. First, the phase will be situated in relation to the internal EU institutional moment and external geopolitical situation to make sure documents are understood in the moment of their creation[5]. The analysis then traces how RQ1 is approached in each phase, examining how the sources frame science diplomacy and its function as an instrument of power. Then RQ2 is explored, looking into how openness and cooperation are positioned in relation to autonomy and protection per phase.

[5] See Appendix B for a visual overview of the corpus and contextual events.

5.1. Baseline (Pre-2012): S&T Cooperation Without Diplomacy

Before moving into the analysis of the main four phases, an understanding of the discourse on science and technology (S&T) present immediately before the period of study is highly relevant. The Commission's *A strategic European framework for international science and technology cooperation* (COM (2008) 588)[6] is a good starting point, as it constitutes a key document of the FP7 era, and the framework through which the EU articulated its international scientific engagement. During this period, international S&T cooperation was seen as necessary for the enlargement of the European Research Area (ERA), seeking to make it "open to the world" (EC, 2008, p. 3). This document is useful to understand the context in which the term 'science diplomacy' appears in the EU, as it was characterized by an era of cooperation and multilateralism in science. Published four years before the term first appeared in EU institutional communications, it shows what the EU was already doing under a different name and established a baseline against which the transformation of the discourse on science diplomacy becomes visible in the following phases.

Some of the ideas and values that will dominate the first analytical phases are already employed in this institutional source, where international S&T cooperation is presented as positive-sum and framed mainly through vocabulary of openness, partnership and shared global challenges. In 2008 there was already a notion of the strategic dimension of S&T, apparent in the use of the recurring term 'strategic cooperation' (EC, 2008, p. 8). While the focus is placed on cooperation, S&T is framed as a strategic tool that can help deepen partnerships with third countries and strengthen the EU as a whole. The idea of increasing competitiveness is also already present but linked to shared progress rather than to autonomy. Competition is framed in a positive light, referring to productive competition through statements such as "Excellence in research stems from competition between researchers" (EC, 2008, p. 4) or "a healthy balance between cooperation and competition needs to be found" (p. 8). The dimension of geostrategic rivalry in the domain of science and technology is still not prevalent, with partners being presented as collaborators in facing shared challenges rather than as competitors to be managed. The document speaks of "equitable partnership, common ownership, mutual advantage, shared objectives and reciprocity" as the key principles necessary for bilateral S&T

[6] Documents will be addressed using shortened titles. For complete document titles and issuing body, see Appendix A, Table A1.

agreements (EC, 2008, p. 13).

What is missing from this earlier approach is the diplomatic dimension to S&T. Many of the functions that will later be attributed to science diplomacy are highlighted, including the fostering of strategic partnerships with third countries (p. 8), or the strengthening of the global position of Europe (p. 3). However, while S&T are framed as instruments of cooperation, competitiveness and progress, they are not yet perceived explicitly as instruments of foreign policy. There is no mention of soft power, of strategic interests in a geopolitical sense, or of the use of S&T to manage relations with other states. Science here is explored solely through the lens of the ERA and its global projection, and not from the perspective of furthering EU foreign policy objectives through scientific means.

This point of departure serves as a baseline against which to read the main analytical phases. The 2008 framework shows an EU already engaged in international scientific cooperation and already calling it strategic, but without yet making explicit the diplomatic and foreign policy dimension of science. The phase-by-phase analysis begins in 2012, when that diplomatic framing of science first appears.

5.2. Phase 1 (2012–2014): The Emergence of Science Diplomacy

Phase contextualization

Phase 1 explores a single key primary source: *Enhancing and focusing EU international cooperation in research and innovation* (COM(2012)497). This document represents a turning point in the evolution of science diplomacy in the EU, as it is the first instance of an EU institutional communication explicitly referencing the term 'science diplomacy' (EC, 2012). The global and EU contexts during the time of writing of the document are key to better understand its contents. On the EU level, the institution was undergoing a defining moment of reconfiguration after the entry into force of the Lisbon Treaty in 2009. This involved the modification of the Treaty on the European Union (TEU) and the Treaty on the Functioning of the European Union (TFEU), which in turn led to the restructuring of the institutional setting for the EU's actions in the international sphere (p. 2). The establishment of the role of the Union's High Representative for Foreign Affairs and Security Policy, supported by the newly established EEAS[7], sought

[7] The EEAS was officially established in January 2011.

to ensure the consistency of the Union's external actions, including R&I. During this time, Europe perceives and positions itself as a "world leader in research and innovation" (p. 2).

On the broader international level, this period is marked by the rise of emerging economies, concretely BRICS, as key R&I actors. EU discourse points to the development of a multipolar system, where previous R&I leaders like the EU, the US and Japan now have to share the scene with countries such as Brazil, India, China or South Korea. Against this backdrop, the EU first introduces science diplomacy into EU R&I discourse.

RQ1. Framing and function as an instrument of power

In this initial phase, science diplomacy is explored only tangentially, within the broader objective of helping enhance international cooperation activities in research and innovation. The single mention of science diplomacy is the following:

> '**Science diplomacy**'[8] will use international cooperation in research and innovation as an instrument of soft power and a mechanism for improving relations with key countries and regions. Good international relations may, in turn, facilitate effective cooperation in research and innovation (EC, 2012, p. 4).

As can be seen in this quote, international cooperation is framed as a tool to be used in the sphere of diplomacy. Using science to improve relations with other countries is expected to have a positive impact on collaboration regarding research and innovation and the relationship is presented as reciprocal: cooperation enhances good relations, and these good relations feed further cooperation. Science diplomacy is framed from a soft power angle, the objective being the bettering of foreign relations. The EU does not yet set out specific goals for science diplomacy or clarify in depth its approach to the term, as no concrete definition is provided. This diplomatic dimension of science only appears once, as an addition to the three stated objectives of international cooperation, and is not developed further within the document. Even so, this first attempt to include science diplomacy in EU R&I vocabulary is significant, reflecting a growing perception that science should play a role in the EU's diplomatic actions, even if that role is not yet clearly defined.

[8] Single quotation marks and bold are maintained from the original text.

RQ2. Strategic logic: cooperative vs. protective

When it comes to the main strategic logic in this phase, in which science diplomacy is embedded, openness and cooperation dominate. Openness is the main principle from which the rest follows, with *COM(2012)497* highlighting how "the move towards open access is a worldwide endeavour" (EC, 2012, p. 6) and announcing that the upcoming Horizon 2020 will be "fully open to participation from all over the world" (p. 6). The focus is placed on strengthening dialogue with other countries through a "dual approach of openness complemented by targeted international cooperation activities" (p. 4). The cooperative register recurs throughout, in the key concepts of common interests and principles, mutual benefit, partnership, synergy, as well as the idea of tackling global challenges jointly.

Strategic vocabulary is itself mostly linked to cooperative ends. The document is concerned with proposing a strategic approach to "enhance and focus the Union's international cooperation activities" (p. 3), and the adjective 'strategic' is used to qualify relationships of engagement as in the call for "strategic long-term partnerships" (p. 7).

Nonetheless, some protective elements are present, though far less prominent. There is already a recognition that the EU must act strategically to preserve its economic interests, and the text points to the need to balance cooperation on shared challenges "while safeguarding the interests of the Union's companies" (p. 6). The concern is ensuring fair competition, with terms such as "level playing field" starting to emerge (pp. 5, 9), and the fair treatment of intellectual property rights (IPR), invoked to "avoid uncontrolled loss of the Union's know-how" (p. 6). There are also brief mentions of reciprocity, which point in the same direction. However, these concerns remain secondary and do not drive the logic of the text. The arrival of new R&I players is not framed as a threat. The EC acknowledges the need to remain competitive in the face of these actors but makes no direct mention of risks or threats these may pose at the political or security level.

Phase synthesis

All in all, this period introduces science diplomacy into EU strategy as a soft power instrument to be used within a logic of collaborative R&I, where the vocabulary of openness and cooperation dominates. This mention of science diplomacy, however, is vague and the concept is not yet explored in depth or operationalized. There are already signs of a protective dimension in Phase 1, in which cooperation must be balanced with

the EU's interests, mainly in relation to fair competition and protection of IPR. However, while strategic-protective vocabulary is present, it surfaces only briefly and is often linked to broader cooperative goals.

5.3. Phase 2 (2015–2020): Science Diplomacy as Policy Vision

Phase contextualization

This second phase is key to the development of science diplomacy in the EU, as for the first time, the concept occupies a central position within the policy vision of the Commission's DG RTD. At the EU level, this phase unfolds under the Juncker Commission, during Carlos Moedas's mandate as Commissioner for Research, Science and Innovation. In June 2015, Moedas set out the policy agenda that defines this period – *Open Innovation, Open Science, Open to the World* – within which science diplomacy is situated. The phase also coincides with most of the Horizon 2020 Framework Programme (2014–2020), through which the three EU-funded research projects on science diplomacy – S4D4C, InsSciDE and EL-CSID – were developed, generating a knowledge base and a series of outputs on the science diplomacy landscape in the EU.

This period is shaped by a changing geopolitical landscape, marked by key events including the deterioration of EU-Russia relations after the annexation of Crimea, the peak of the migration crisis in 2015, the Brexit referendum and the election of Donald Trump in 2016, and the growing US-China tensions regarding technology from 2018 onward. In addition, there is a recognition of the growing importance of R&D in the world, and of the fact that the relative weight of the EU in this changing landscape is decreasing further (EC, 2016). The US and Europe together represented nearly two-thirds of global R&D expenditure in 2000, a share that shrank by half by 2013, which is mainly attributed to the rapid rise of China (p. 61).

Phase 2 is explored through four primary sources spanning 2016 to 2020. The main document analyzed is the Category A policy text *Open Innovation, Open Science, Open to the World– a vision for Europe* (EC, 2016), as it is the first policy declaration where science diplomacy is assigned a defining role. Three Category B documents complete the corpus: *Tools for an EU Science Diplomacy* (Van Langenhove, 2017), the *Madrid Declaration on Science Diplomacy* (S4D4C, 2019) and the *SFIC Science Diplomacy Input Paper* (SFIC, 2020).

RQ1. Framing and function as an instrument of power

Science diplomacy is more clearly defined and framed in this phase. Commissioner Moedas puts forward his view on the role to be played by science diplomacy in his speech "The EU approach to science diplomacy", delivered in Washington DC on June 1st 2015. In it, science diplomacy is framed as "the torch that can light the way, where other kinds of politics and diplomacy have failed" (EC, 2016, p. 64). He explicitly calls for science diplomacy to play a leading role in the EU's global outreach activities due to its "uniting power", as a tool that can help improve relations with close partners, but even more importantly in contexts where relations are more complex (EC, 2016, p. 64). This approach shows that science diplomacy is framed as a key tool for cooperation and the bettering of relations, as well as for building trust among partners.

This view is materialized in the definition of science diplomacy provided in *Open Innovation, Open Science, Open to the World* as "the use of science to prevent conflicts and crises, underpin policy making, and improve international relations in conflict areas where the universal language of science can open new channels of communication and build trust" (EC, 2016, p. 74). This definition has a clear cooperative framing, in which science diplomacy is largely associated with key concepts such as unity, mutual understanding and trust, dialogue, and partnerships.

Phase 2 also tries to more clearly delimit what science diplomacy means and which activities it includes. Both the 2017 Tools report and the 2020 SFIC Input Paper try to operationalize more aspirational or vision-oriented documents into concrete recommendations and tools, defining and mapping science diplomacy efforts at the EU and MS level[9]. Both sources reference the most well-established theoretical framework in the field, the one put forward by the AAAS & Royal Society in their 2010 report, as a good point of departure (Van Langenhove, 2017, p. 8; SFIC, 2020, p. 2). However, new dimensions and insights are also introduced. Even though science diplomacy is starting to play a more defined role in EU policy, findings show that it is still not clearly implemented. One of the key arguments is that many science diplomacy activities are not labeled as such, as most EU MS do not have a coherent and comprehensive science diplomacy strategy (Van Langenhove, 2017, p. 26). This leads to the need to differentiate between implicit and explicit science diplomacy practices, and to the further subdivision of explicit practices into strategic, operational and support tools (Van Langenhove, 2017,

[9] The key science diplomacy activities to be implemented according to the SFIC 2020 report can be found in Appendix C, Figure C2.

p. 12–13). At the EU level, science diplomacy is mentioned as one of the policy domains of the EEAS but is not yet central to its strategy (Van Langenhove, 2017, p. 26).

There is also an attempt to differentiate science diplomacy from other related concepts, concretely from international science cooperation. The *Madrid Declaration on Science Diplomacy* clearly states that science diplomacy "tackles interests that go beyond the scientific ones and may directly or indirectly serve to advance diplomatic goals" (S4D4C, 2019, Vision section, par. 3). When compared to previous documents, a clearer and more direct link between science and diplomatic practices is evident.

Another key development in this time period is the explicit call for science diplomacy to play a role in the EU's external policies, and "be used to build bridges between people and nations and encourage peaceful relations" (EC, 2016, p. 64). In this context, science diplomacy is said to be an "effective soft power tool" that is being increasingly used for the purpose of reaching external policy objectives in relation to peace, humanitarian aid, and social and economic development (EC, 2016, p. 74). Category B sources support this view of science diplomacy as a key instrument for European soft power, one which is said to be gaining relevance in the face of recent geopolitical events and which should be used as a "mechanism for improving relations between the EU and key countries and regions across the world" (Van Langenhove, 2017, p. 10–11). Science diplomacy is seen, concretely, as a tool for increasing regional security in the EU's neighborhood (Van Langenhove, 2017, p. 28; SFIC, 2020, p. 12).

The 2016 RTD policy declaration (EC, 2016, p. 75) goes further, calling for science diplomacy to be embedded in the new 2016 *Global Strategy on the EU's Foreign and Security Policy*[10] (EEAS, 2016). This aspiration was not realized, as science diplomacy is ultimately absent from the Global Strategy as adopted (Van Langenhove, 2017, p. 27). This provides evidence that the will to connect science diplomacy to the EU's external action is present in this phase but is still confined to R&I policy and does not reach the foreign policy domain. Nonetheless, Van Langenhove (2017) continues to recommend this link, proposing that RTD policy be connected to the EU's Foreign and Security Policy, that a culture of science diplomacy be developed within the EEAS, and that dialogue and collaboration among EU institutions be improved through a focused EU strategic plan on science diplomacy (p. 27).

[10] The *Global Strategy* was adopted in June 2016, shortly after the release of *Open Innovation, Open Science, Open to the World– a vision for Europe* in the EU Publications Office website in May 2016.

RQ2. Strategic logic: cooperative vs. protective

The nature of the strategic logic of science diplomacy in this phase continues to be clearly strategic-cooperative, with openness remaining the central value. 'Open to the World' becomes the EU strategy for global R&I cooperation and science diplomacy, where openness to and engagement with the world is determined to be a key strategic priority for Europe (EC, 2016, p. 78). This openness is seen as an instrument to achieve broader objectives, mainly the access to talent, knowledge, markets, and overall, a stronger global position. An EU Science Diplomacy strategy is seen as necessary, but it is argued that it should not only focus on organizational issues but also have a clear vision which should combine "self-interests and aspirations to have a positive impact on the world" (Van Langenhove, 2017, p. 29). The documents in this phase are rich in cooperative and collaborative language and are a direct continuity of Phase 1. The metaphor of using science diplomacy for 'building bridges' reoccurs across the phase in different senses: between countries (EC, 2016, p. 74), between MS and the EU (Van Langenhove, 2017, p. 26; SFIC, 2020, p. 13), and between science, interests and global challenges (S4D4C, 2019, Vision section, par. 3).

While this cooperative logic is dominant, there are some developing ideas that point towards a more protective strategic dimension, even though it is still often implicit and uneven like in Phase 1. The competitiveness-related language is mostly linked to attractiveness and global competition for talent, not from the point of view of overt protection, but rather following a logic of opportunity. Even so, some specific domains are perceived to be in need of oversight. Documents speak of preserving economic interests "notably as regards intellectual property (IP) rights and standards" (EC, 2016, p. 60). Risks regarding innovation are named, but not explored in depth, focusing on the need to address risks related to "weak enforcement of IP regulations, differences in rules, laws and judicial systems" (SFIC, 2020, p. 17). The most straightforward protective logic evident in this phase is the positioning of science diplomacy as a tool to help ensure regional security in the European neighborhood. Surrounding areas are said to contain "conflict areas" and "weak and failed states" which pose "serious security threats for the EU" (Van Langenhove, 2017, p. 28).

Phase synthesis

Phase 2 explores the first moment at which science diplomacy becomes an instrument in its own right within EU discourse, no longer solely linked to strategic cooperation.

There is an initial attempt to define what the concept entails and how it can help the EU achieve its objectives. Science diplomacy continues to be framed as a soft power tool, but the call for its integration within EU external action is marked more explicitly than in previous phases. The strategic logic remains dominantly cooperative, with openness persisting as the foundational value around which R&I policy (and science diplomacy) is meant to revolve. A minor protective dimension remains present, maintaining two of the themes already found in Phase 1 –the preservation of economic interests and the safeguarding of IPR– and adding a new dimension concerning the security of the European neighborhood. The explicit vocabulary of autonomy is still absent. Phase 3 will examine whether this subordination of the protective register holds as a discursive turn begins to permeate R&I institutional texts.

5.4. Phase 3 (2021–2022): The Conditional Turn

Phase contextualization

Phase 3 opens after the COVID-19 pandemic, presented by the Commission as proof that challenges cannot be contained within national borders and therefore require cooperation to face shared challenges (EC, 2021, p. 7). However, there is also a growing recognition that the EU is operating in a "transformed global environment", in which geopolitical tensions are rising, and the EU continues to be overcome in terms of spending in science and technology by other powers (EC, 2021, p. 1). This period is characterized by an increasing technological and economic competition or "geo-economic rivalry", largely driven by the end of the unilateral US order and the rise of China as a systemic rival, a rise based mainly on science, technology and economic transactions rather than on hard power (Fägersten, 2022, p. 8). This geoeconomic shift entails that interdependence, which was once seen as preventing conflict, is now perceived to create vulnerabilities that can be leveraged for influence.

This external shift occurs alongside an internal discursive turning point. Although von der Leyen's Commission, which described itself as a "geopolitical Commission" (von der Leyen, 2019), took office in late 2019, it is in Phase 3 that this framing begins to permeate the EU's R&I institutional texts. Within this context, the EU sets out to manage its interdependencies with the goal of achieving autonomy and sovereignty, an aim which is reflected in the EU institutional documents found in this phase. In addition to the primary

sources analyzed, other key documents are adopted in the same timeframe, including *Tackling R&I Foreign Interference* (EC, 2022) and the *Strategic Compass for Security and Defence* (Council of the EU, 2022). This geopolitical landscape thus affected the EU's approach to R&I, and more generally to science and technology in relation to external action and security. It is within this context that science diplomacy is repositioned.

This phase is examined through three interrelated primary documents: the Commission's *Global Approach to Research and Innovation* (May 2021), the Council Conclusions on the Global Approach (September 2021) and the SFIC *Roadmap & Impact Pathways for a EU Science Diplomacy Agenda* (December 2021). The report *Leveraging Science Diplomacy in an Era of Geo-Economic Rivalry* (Fägersten, 2022), one of the publications associated with the InsSciDE H2020 project[11], is used as supporting secondary literature.

RQ1. Framing and function as an instrument of power

A defining feature of Phase 3 is the progression visible across the primary sources themselves, and the way different EU institutions begin to talk about science diplomacy in coordination. The Commission's Global Approach introduces science diplomacy briefly, calling for "a stronger focus on science and technology in the EU's foreign and security policies in terms of '**Science Diplomacy**'" (EC, 2021, p. 4). The Council Conclusions then act upon this proposal directly and, in paragraph 34, the Council explicitly calls on the Commission and the EEAS "to develop a European Science Diplomacy Agenda and to present it to the Council", setting a deadline to report on their progress by 2023 (Council of the EU, 2021, p. 13). The SFIC Roadmap (found in Appendix C, Figure C3) then proposes an initial approach towards the establishment of this agenda by presenting the document as a "concrete input" towards this task (SFIC, 2021, p. 1). This progression across documents is relevant, as EU institutions are, for the first time, interacting explicitly to institutionalize science diplomacy as a practice and determine the concrete steps to take, the inputs needed and the objectives and outputs to achieve.

Within this process, the framing of the term is significant. Science diplomacy appears in the section "Reaffirming EU Commitment to International Openness and Fundamental

[11] Report mentioned in the Publications section of InsSciDE 's CORDIS Results website: https://cordis.europa.eu/project/id/770523/results

Values in Research and Innovation" (EC, 2021, pp. 2–5), positioning it within the EU's cooperative agenda. However, new dimensions appear. It is presented as a tool to help the EU "meet demand and interest from partner countries" but also to play to "the EU's strengths as a research and innovation powerhouse" (EC, 2021, p. 4). The Commission also introduces a concrete example of the success of science diplomacy, pointing to the All-Atlantic Ocean Research Alliance as a direct result of these efforts (EC, 2021, p. 7).

In the previous phases, the definitions of science diplomacy and the objectives invoked mainly revolve around the bettering of relations with other countries, building trust and tackling global challenges together. In Phase 3, this dimension of science diplomacy is maintained, but it becomes nuanced. There is a direct recognition of the duality of science, compared to previous phases which focused almost exclusively on science as a universal language and a uniting force. Science and technology are now portrayed as "drivers and enablers" of foreign policy, but also as objects of geopolitical tension (EC, 2021, p. 19). Contemporary secondary literature approaches science diplomacy as serving five EU foreign policy interests: fostering a rules-based order, addressing global challenges, building a resilient neighborhood, ensuring the security of Europeans and helping achieve the EU's strategic autonomy (Fägersten, 2022, p. 11).

Science diplomacy is still explicitly framed as an instrument of soft power, however, the way this is done differs between phases 2 and 3. While in Phase 2, science diplomacy is soft power as attraction and bridge-building, in Phase 3, the focus is on soft power as projection. *COM(2021) 252* states plainly that a larger focus on science diplomacy would help the EU "project soft power and pursue our economic interests and values more effectively" (EC, 2021, p. 4). The SFIC Roadmap, in the same register, frames science diplomacy as a "fully-fledged instrument in the EU's toolbox" (SFIC, 2021, p. 4). Science is increasingly seen as a means by which the EU can advance its own values and interests in a 'changing world'. While science diplomacy is still not the main or sole focus of official Commission or Council documents, it is starting to be presented by both institutions as a tool to be operationalized to help pursue EU interests and spread its values.

RQ2. Strategic logic: cooperative vs. protective

In this phase, there is a shift from a clearly dominant strategic-cooperative logic, towards a strategic logic where cooperation and protection now coexist. The EU does not abandon cooperation, openness and partnership, but it begins to treat them as choices to

be strategically managed according to reciprocity, interests and risks. This is relevant to science diplomacy, as it now operates in a context where cooperation is increasingly conditional.

The strategic-cooperative logic is still dominant in Category A documents. The Commission's Global Approach stresses the importance of the free exchange of ideas and the co-creation of solutions and reaffirms the EU's duty to "lead by example" and promote "rules-based multilateralism" (EC, 2021, p. 1). This same cooperative register is reinforced in the Council Conclusions, which underline that the EU's approach to R&I needs to be built on the principles of "openness, rules-based multilateralism, shared values and priorities, facilitation of knowledge circulation and exchange of ideas" (Council of the EU, 2021, p. 5). However, this commitment to openness and cooperation is no longer unconditional, and is often nuanced to include strategic-protective elements. The Global Approach clearly states that Europe "will remain open to the world" (EC, 2021, p. 3), but this openness is increasingly tied to shared values, respect for fundamental rights, reciprocity and the protection of EU interests (EC, 2021, p. 14). Cooperation is now accompanied by terms such as 'well-targeted' (EC, 2021, p. 14), 'modulated' (p. 1), 'tailored' (Council of the EU, 2021, p. 6) or 'balanced' (p. 10).

The documents make an explicit attempt to integrate both a cooperative and protective logic, portraying them as compatible and even necessary. Key formulations that address both dimensions in the same concept or phrase appear across the corpus, including "reciprocal openness", "open strategic autonomy", and the guiding principle of being "as open as possible, as closed as necessary" when engaging with global partners (Council of the EU, 2021, p. 5). This new vocabulary allows the EU to maintain its commitment to openness within a new logic, framing protection not as a departure from cooperation but as the condition under which cooperation can continue responsibly.

The protective register itself is justified in the documents as a response to a changing geopolitical landscape, in which tensions are rising and both human rights and fundamental values such as academic freedom are being increasingly challenged (EC, 2021, p. 1). The Commission also points to the way major powers are now seeking technological leadership through "discriminatory measures" and the instrumentalization of R&I "for global influence and social control" (EC, 2021, p. 1). This leads to a need to engage with non-EU countries through a "nuanced and modulated approach" (EC, 2021, p. 14). For example, while China was perceived as an economic competitor and growing economic power in previous phases, it is now also approached as a "systemic rival to the

EU" (EC, 2021, p. 15). Developing cooperation with China is made explicitly conditional on reaching a level playing field and reciprocity (EC, 2021, p. 15). More explicitly protective terminology accompanies this turn, addressing the need to mitigate risks to EU interests (EC, 2021, p. 6) as well as the risk of dependency on non-EU countries (p. 7). The need to deal with "foreign interference" is also mentioned, in order to "shield" R&I stakeholders "from coercive, covert, deceptive or corrupting foreign actors" (EC, 2021, p. 6). Fägersten (2022) reads this as the EU's search for "a path between unfettered cooperation and scientific decoupling" (p. 4), where the EU can no longer remain open to any sort of cooperation and must find new ways to interact with non-democratic countries by establishing a middle ground and explicit red lines on topics like censorship and discrimination (p. 18).

This protective language is absorbed into science diplomacy discourse, as can be seen in the SFIC (2021) report. Science diplomacy is expected to help position the EU as a key actor in societal challenges "while strengthening open strategic autonomy and democratic principles" (SFIC, 2021, p. 3). Science diplomacy is still perceived as a clearly cooperative endeavor, but the language of conditionality has begun to attach to it.

Phase synthesis

Phase 3 shows a clear shift in how science diplomacy is framed and how it operates within the EU's broader strategic logic. A key development is the coordinated interaction of EU institutions to build a common understanding of science diplomacy in the EU, turning it into an institutional project. Science diplomacy continues to be framed as soft power, but the focus is now on projection and on its role as a tool the EU can use to advance its own interests and values. The cooperative logic also remains dominant, but it is no longer unconditional. It is now paired with a more protective register through new formulations such as "open strategic autonomy" or "as open as possible, as closed as necessary", which allows openness to remain a key value under new terms. Phase 4 brings the analysis to the present moment, examining where the institutionalization of science diplomacy now stands and how the EU's strategic logic has evolved.

5.5. Phase 4 (2023–2026): Institutionalization of Science Diplomacy and the Balancing Logic

Phase contextualization

The 2023–2026 time period is highly relevant for EU science diplomacy and is characterized by its operationalization and institutionalization in the EU. This phase unfolds against intensifying US-China technological rivalry, the continuation of Russia's aggression against Ukraine, the growing role of artificial intelligence in science and the increasing pressure on multilateralism and on the Sustainable Development Goals (SDGs). Within this environment, the EU points to the need to "be more assertive in pursuing its strategic interests", as expressed in the 2024-2029 Political Guidelines for the Next European Commission (von der Leyen, 2024, p. 25) and reinforced by the Letta (2024), Draghi (2024), Heitor (EC, 2024) and Niinistö (2024) reports which place R&I at the heart of EU competitiveness and security. Science diplomacy is perceived as a key tool to achieve these goals. In July 2023, at the informal meeting of the Competitiveness Council, science diplomacy was discussed for the first time at a political level, where it was presented as a priority to make Europe stronger in the world and asking for the creation of an EU framework (Spanish Presidency of the Council of the European Union, 2023). Over the following three years, science diplomacy has been further explored through two European science diplomacy conferences, and through the development of science diplomacy-specific documents by experts, as well as by EU institutions, namely the EC and the Council of the EU.

This phase explores a variety of primary sources. Within Category B, sources include the outcomes of the 1st and 2nd European Science Diplomacy Conferences[12] (ESDC), and the EU-commissioned expert report *A European Framework for Science Diplomacy* (EC, 2025; hereafter the Expert Report). Moving on to Category A, we find two key documents: the Commission's proposal for a Council Recommendation (EC, 2026b), and the Council's recommendation itself (Council of the EU, 2026b).

RQ1. Framing and function as an instrument of power

The three main sources explored in this phase show the co-production of knowledge regarding science diplomacy and its official institutionalization, where expert input, Commission Proposal and Council Recommendation interact. The Expert Report (EC,

[12] The conferences were held in 2023 and 2025 respectively.

2025) gathers the input of 130 scientists and diplomats, providing the initial framework from which later institutional texts draw. Almost a year after the publication of this report, the Commission then translates this input into a formal proposal (EC, 2026b), which the Council negotiates and sets for adoption (Council of the EU, 2026b).

The framing of science diplomacy within these documents is different compared to previous phases. To begin with, it is key to highlight that science diplomacy is no longer explored tangentially within broader R&I institutional texts. For the first time, science diplomacy has Commission and Council documents (Category A) exclusively dedicated to it. Phase 4 explores what science diplomacy is for (mission), what it is (definition), and what it does (functions).

The Expert Report puts forward a mission, objectives and values for science diplomacy (EC, 2025, pp. 33–35). It defines the mission of science diplomacy as ensuring that "the Common Foreign and Security Policy and Common Security and Defence Policy leverage on scientific expertise and networks, and the European Research Area leverages on diplomatic efforts to preserve spaces for negotiation, cooperation and exchange, especially in conditions of tension and competition" (EC, 2025, p. 33). We see here that science diplomacy is framed as the instrument that links R&I and foreign policy, assigning it the role of preserving cooperation even in challenging times.

On the definition question, the Expert Report (EC, 2025) recognizes the ongoing scholarly and policy debate and contributes to it by proposing a new dimension to be added as a fourth pillar to the 2010 Royal Society & AAAS typology: "diplomacy in science", which refers to scientific institutions themselves using diplomatic skills and tools, becoming diplomatic players (see Appendix C, Figure C5). The Council Recommendation (Council of the EU, 2026b) proposes an institutional definition of the term:

> 'science diplomacy' refers to the direct or indirect use of science, scientific evidence and scientific cooperation to inform and support foreign policy at different levels, as well as to the deployment of diplomacy to support and promote international cooperation and scientific progress (Council of the EU, 2026b, p. 9).

This definition allows the provisions of the recommendation to be read from a shared starting point, operationalizing the term within EU discourse. This is the first EU institutional document to set out a working definition of science diplomacy to this operational end. Phase 3 named science diplomacy as a strategic instrument and called

for its operationalization but never defined it. The Council Recommendation closes that gap, and the policy dimension becomes central. The definition places the use of science for policy first, with the use of diplomacy for international cooperation closing the sentence.

The three sources also explore the vital functions of science diplomacy, building on the knowledge from previous documents and adding contributions (see Appendix A, Table A2). The Expert Report proposes three functions: strengthening EU competitiveness as a global S&T actor, mobilizing R&I for peace and multilateralism, and managing public goods sustainably (EC, 2025, p. 33). The Commission Proposal expands them to four, adding the role of science diplomacy in the defense of the EU's democratic values, strategic interests and technological and data sovereignty (EC, 2026b, p. 2). Finally, the Council Recommendation maintains these four functions and includes one more, adding science diplomacy's role in enhancing trust in science, integrating foresight and scientific advice into decision-making, and promoting public engagement (Council of the EU, 2026b, p. 6). The Expert Report's closing vision condenses the overall framing, stating that science diplomacy is to become "a key instrument in the EU's diplomatic toolbox, fostering peace, European competitiveness, and a safe, sustainable and prosperous future for all by harnessing the power of science and technology in a responsible way" (EC, 2025, p. 78).

The role of science diplomacy as an instrument of power shifts in this phase. While science diplomacy is still mainly portrayed as an instrument of soft power, for the first time a hard power dimension is introduced. The first instance of this 'hard power approach' comes from the 1st ESDC (2023), which asked the future framework to reflect on the use of science diplomacy as a soft and as a hard power (para. 7), a proposal then developed in the Expert Report (EC, 2025) itself. The expert-developed framework calls for a balanced approach, in which science diplomacy is used both as a soft and hard power simultaneously (EC, 2025, p. 5), recognizing that there are "instances when science diplomacy needs to be used as a hard power, i.e., for shutting doors rather than keeping them open by applying restrictive measures" (p. 43), giving as an example the aftermath of the Russian aggression against Ukraine. Science diplomacy thus needs to engage hard power to deal with "threats to peace, democracy and economic security"[13] (p. 34). Action 1.6 turns this into a strategic instrument, asking for the development of a holistic science

[13] For example, unwanted access to or theft of intellectual property.

diplomacy approach to deal with countries "not sharing our values" through the combination of "a mix of soft and hard power approaches" (p. 43). However, this 'hard power' dimension is not explicitly included in either the Commission's Proposal or the Council Recommendation, which approach science diplomacy mostly as a soft power tool (EC, 2026b, pp. 10, 15; Council of the EU, 2026b, pp. 2, 12), drawing from the underlying logic of hard power elements but not naming it as such.

RQ2. Strategic logic: cooperative vs. protective

Phase 4 follows the same line as Phase 3, however, we see that the strategic logic of protection and autonomy is now fully consolidated and interacts almost permanently with the logic of cooperation. The most relevant move in this phase is that this interaction no longer takes place within broader R&I institutional texts, as it did in Phase 3, but within documents that are themselves dedicated to science diplomacy. The cooperative and protective logic is now directly applied to science diplomacy and to the role it is expected to play.

The strategic-cooperative logic remains a clear foundational commitment of EU science diplomacy, and the need to preserve openness is highlighted. Concretely, the Expert Report clearly states that "we should work towards open and safe research cooperation rather than opposing openness with closure" (EC, 2025, p. 45), and "open science and open data" are maintained as one of the principles science diplomacy should be based on (Council of the EU, 2026b, p. 7). Key cooperative terms and concepts from previous phases are also retained, including the role of science as a "universal language" (Council of the EU, 2026b, p. 2) or its capacity to build bridges by connecting and inspiring peoples and nations (Council of the EU, 2026b, p. 2). In this sense, science diplomacy is seen as a "connective tissue" that can help foster peace, manage global public goods and tackle global challenges (2nd ESDC, 2025, para. 7). Science diplomacy continues to be approached as an opportunity for building partnerships and trust, favoring collaboration, co-creation, and enhanced coordination in the tackling of shared challenges.

Nonetheless, the protective register introduced in the previous phase also plays a central role. This register is once again justified as a response to the "unpredictable geopolitical environment", which is said to be "characterized by increasing pressure on international cooperation, democracy, multilateralism, the rule of law and science itself" (Council of the EU, 2026b, p. 4). This hostile context in which scientific developments

and cooperation are being affected by global politics has led to the need to develop an EU approach to "avoid vulnerabilities" (EC, 2025, p. 6). The science diplomacy framework introduces an explicit 'us vs. them' approach, clearly differentiating between "likeminded countries" (EC, 2026b, p. 4) or "trusted partner countries" (EC, 2025, p. 42), and "countries not sharing our values" (EC, 2025, p. 43) or "non-likeminded countries" (EC, 2026b, p. 6). However, even though this difference is established, there is still a clear intention to use science diplomacy to foster dialogue not only with the Union's friends and partners, but also with these non-likeminded countries or adversaries if necessary (EC, 2026b, p. 1).

These cooperative and protective dimensions are unified under a balancing logic, in which cooperation is still the underlying fundamental value but is now followed by a protective counterpart. While this trend was already identified in Phase 3, it is now clearer and directly applied to the establishment of science diplomacy in the EU. There are many examples of these two-part formulations in the corpus for Phase 4. There is a clear need to "balance competition and cooperation as well as openness and restrictedness" (EC, 2026b, p. 6), presented as one of the nine recommendations put forward by the Expert Report as a strategic instrument (see Appendix C, Figure C4) (EC, 2025, p. 9). This follows the logic of Phase 3's principle to be 'as open as possible, as closed as necessary', a motto which is also maintained and referenced in Phase 4 (1st ESDC, 2023, para. 7; EC, 2025, p. 45; Council of the EU, 2026b, p. 3). International scientific cooperation is said to need to be both open and secure (Council of the EU, 2026b, p. 6). Another example of this double logic is the call to use science diplomacy as a "trust-building tool" for dialogue with third countries, but immediately after establishing the protective limit of ensuring that this dialogue does not result in the unauthorized transfer of sensitive knowledge, or attempt to undermine Union level sanctions (Council of the EU, 2026b, p. 11).

All in all, instead of talking about two separate logics that coexist, we now see that the EU is creating a single balancing logic in which one dimension necessitates the other. Cooperation and openness are still the central values around which the EU revolves, but in order to preserve other key EU values such as democracy, free exchange of ideas, or the free flow of ideas, some base requirements need to be met. In a similar way, autonomy and protection of EU interests should favor collaboration and cooperation as much as possible and strive for the creation of partnerships with like-minded countries and dialogue with non-like-minded countries, in order to tackle global challenges in an effective and coordinated way. Science diplomacy plays a key role in the success of both

of these dimensions, as it can contribute both to the protection and promotion of EU values, and to the fostering of cooperation that is at the same time open and safe.

Phase synthesis

Phase 4 shows the consolidation and full institutionalization of EU science diplomacy. For the first time, science diplomacy has Commission and Council documents exclusively dedicated to it, which establish the definition, mission and functions of the concept. The framing also shifts slightly. Science diplomacy continues to be mainly framed as soft power but is increasingly perceived as soft power with hard power elements. The strategic-cooperative and strategic-protective logics, which in Phase 3 operated within a broader R&I framework, appear now as a joint balancing logic directly applied to science diplomacy. Science diplomacy emerges as the instrument through which the EU can both protect and promote its values and foster a cooperation that is at the same time open and safe.

5.6. Discussion

The phase-by-phase analysis revealed the changes experienced by EU science diplomacy over the past 15 years, pointing to a gradual reconfiguration rather than a rupture. While the EU's intention to give scientific activity a strategic approach was already present in *A strategic European framework for international S&T cooperation* in 2008, its diplomatic dimension becomes explicit through the introduction of 'science diplomacy' as a term in EU discourse. Science diplomacy moves from a single mention in passing in a 2012 R&I communication, to having a dedicated EU framework adopted in 2026 (Council of the EU, 2026b), becoming an institutionalized instrument with a mission, definition and functions. The main findings from the analysis are summarized in Table 1, allowing for more effective cross-phase comparison to trace this evolving EU science diplomacy discourse. Using Table 1 as support, the discussion sets out to directly answer the two main research questions: how science diplomacy has evolved and been framed over the years, and whether the autonomy turn, explored through the rising prominence of a protective register, departs from or reframes the EU's commitment to openness and cooperation.

Table 1. *Discursive evolution of EU science diplomacy across the four phases (2012–2026)*[14]

DIMENSION	PHASE 1 (2012–2014)	PHASE 2 (2015–2020)	PHASE 3 (2021–2022)	PHASE 4 (2023–2026)
Framing of SD (RQ1)	First explicit mention; not defined in itself; framed as a tool to achieve international scientific cooperation	Cooperative tool for trust, improving relations and tackling shared challenges; distinguished from science cooperation.	Strategic instrument to further EU interests and values; named but not defined.	First EU institutional definition; mission and functions of SD set out.
Function as Instrument of Power (RQ1)	Soft power (improving relations).	Soft power (attraction, bridge-building and uniting power).	Soft power (shifting from attraction to projection).	Soft power with hard power elements (restrictive measures, shutting doors); hard power explicit in Expert Report.
Centrality in EU Discourse (RQ1)	Single mention; introduced tangentially within document dedicated to international cooperation in R&I.	Given a key role in policy vision (DG RTD); expert mapping of SD at EU and MS level.	EU institutions (Commission and Council) interact to ask for the development of an EU SD agenda.	First documents dedicated exclusively to SD (expert report, Commission Proposal, Council Recommendation; fully institutionalized.
Openness and Cooperation (RQ2)	Dominant; foundational, positive-sum principle.	Dominant; with "Open to the World" as the central value.	Still dominant, but no longer unconditional; strategically managed.	Remain the key drivers but are always accompanied by protective elements (e.g. "open and safe cooperation"); conditionality embedded in SD discourse.
Protection and Autonomy (RQ2)	Secondary/implicit; IPR, economic interests, level playing field; no autonomy vocabulary.	Secondary/implicit: economic interests, IPR, plus neighborhood security; autonomy vocabulary still absent.	Explicit vocabulary emerges: "open strategic autonomy", reciprocity, risk, systemic rival.	Consolidated and explicit; likeminded vs non-likeminded, vulnerabilities, sovereignty; balancing logic applied directly to SD.

[14] *Note*. Author's own elaboration.

Regarding RQ1, the analysis shows that EU science diplomacy discourse evolved from marginal mentions of the term in earlier phases into a well-explored and strategically framed instrument of external action. The 'centrality to EU discourse' row in Table 1 traces the cross-phase evolution of science diplomacy's prominence, showing that while earlier documents invoke science diplomacy within broader R&I frameworks, later phases turn toward science diplomacy-specific expert reports, and by Phase 4 the concept becomes fully operationalized within dedicated Commission and Council documents.

In terms of framing, the EU initially approaches science diplomacy through cooperation, trust and global values, but across the phases, it becomes more explicitly tied to EU interests and foreign policy goals. Science diplomacy continues to be framed as a way to make cooperation possible, but by Phase 4 it is also clearly established as a way to make this cooperation serve broader policy objectives. There is a clear attempt to better understand and delimit what science diplomacy entails and what it looks like in the European context. Earlier reports take on the task of mapping science diplomacy practices across MS and find a lack of comprehensive and coordinated efforts (Van Langenhove, 2017), prompting the call for a common agenda which materializes in the Expert Report's framework (EC, 2025). Overall, there is a shift from naming science diplomacy, to defining what it is and how it can support EU goals, with institutions and experts interacting to define the objectives and functions of science diplomacy, as well as the concrete MS actions needed to support its development[15].

The function of science diplomacy as an instrument of power also shifts. In Phases 1 and 2, science diplomacy is presented as a soft power tool associated with attraction, dialogue, trust-building and the ability of science to keep communication channels open even in times of strained political relations. In Phase 3, the focus shifts to soft power as projection, with science diplomacy becoming a tool through which the EU can advance its interests and values, supporting the EU's global influence. By Phase 4, hard power elements attach to the broader soft power role of science diplomacy. The need to combine soft and hard power in science diplomacy is only explicitly named in the Expert Report, however, the Commission Proposal and the Council Recommendation draw on the same underlying logic, approaching science diplomacy as a means of protecting interests and sovereignty (EC, 2026b; Council of the EU, 2026b). Soft power remains the dominant framing, but takes on a harder, more protective dimension.

[15] Through the call for strategic, operational, and enabling actions in the 2026 Council Recommendation.

The findings for RQ1 contribute to the answer of RQ2, exploring whether the growing logic of protection and autonomy departs from or reframes the EU's commitment to openness and cooperation in R&I. The analysis shows that this turn does not constitute a break with the EU's cooperative identity, but rather a reconfiguration that retains openness within a new strategic logic in which protection also has a place.

Openness and cooperation remain the foundational values of science diplomacy across all four phases, but they become increasingly subject to conditions. The cooperative register that characterizes the early period, most visible in the "Open to the World" approach of Phase 2 (EC, 2016), is maintained all the way to Phase 4, where international scientific cooperation is still presented as a main commitment. However, while cooperation remains desirable, it must now be both open and secure at the same time (Council of the EU, 2026b). What changes is not the importance of the value of openness but the way it is approached.

While protective language is implicitly present in Phases 1 and 2, mainly around IPR, economic interests and the 'level playing field', it does not yet constitute a deliberate strategic logic[16]. The language of autonomy is also not yet present in these phases. Phase 3 marks the transition towards the coexistence of a logic of protection alongside the overall logic of cooperation, with the emergence of terms like open strategic autonomy and the principle that EU R&I must be "as open as possible, as closed as necessary" (Council of the EU, 2021, p. 5). The documents justify this protective turn as a response to a changing geopolitical landscape, characterized by fragmentation and the rise of economic and security threats to R&I, where strategic autonomy, reciprocity and protection of EU interests become necessary. By Phase 4, the two dimensions no longer simply coexist, but become integrated into a single balancing logic applied directly to science diplomacy, in which they are framed as mutually necessary. Even so, they are not equally weighted. Openness and cooperation remain the foundational commitments, while protection becomes the condition under which these can continue responsibly.

Taken together, the answers to both research questions show different aspects of the transformation of science diplomacy in the EU. RQ1 shows how science diplomacy has become more prominent, defined and institutionalized as an instrument of EU external

[16] The relative weight of the cooperative and protective registers across phases is shown in the three-word clouds in Appendix A (Figures A1–3), highlighting key terms and phrases. No word cloud is included for Phase 1, as it is the only phase that draws on a single document.

action. RQ2 explains the larger EU R&I framework in which this transformation takes place, exploring the strategic logic surrounding science diplomacy, marked by a reframing rather than an abandonment of openness. Together, they show that science diplomacy rose in prominence amid this reconfiguration, becoming an instrument through which the EU can manage the tension between openness and protection, allowing it to remain open and cooperative while protecting its interests and autonomy.

6. CONCLUSIONS AND PROPOSALS

This study has examined how the EU frames science diplomacy and whether its turn towards strategic autonomy departs from or reframes its foundational commitment to openness and cooperation. To do so, it uses an interpretive discourse analysis of fourteen sources, organized into a pre-2012 baseline and four analytical phases spanning 2012 to 2026. The analysis shows how science diplomacy is framed and defined, how its function as an instrument of power shifts across the period, and how the discourse balances openness and cooperation against protection and autonomy.

The first conclusion concerns how science diplomacy has been framed and how it has evolved as an instrument of power. In 2012, the term appears once and in passing, inside a communication focused on international cooperation in R&I. From this point forward, the prominence of science diplomacy in EU discourse grows, and by 2026 it has a dedicated EU framework, with attempts at providing a definition, mission and functions (Council of the EU, 2026b). Its role as a form of power shifts simultaneously. Science diplomacy moves from being a soft power tool of attraction, to a means of projection of EU interests and values, and finally to soft power which introduces hard power elements when necessary.

The second conclusion focuses on the position of openness and cooperation in this context. The rise of a more protective register does not break with the EU's cooperative identity, as openness and cooperation remain the foundational values of EU science diplomacy across all four phases. What changes is that these are no longer unconditional. The findings show that the EU's science diplomacy discourse moves from openness as an unfettered principle to a balancing logic, in which open cooperation remains central but is now filtered through reciprocity, security, and strategic autonomy. This points to a reconfiguration of openness rather than to a departure from it. Instead of abandoning its

earlier ideals, the EU is adjusting them to today's realities. Within this logic, science diplomacy is presented as a tool that can hold cooperation and protection together, serving a double purpose: it allows Europe to remain open and collaborative, while also strengthening its ability to protect its interests and stay competitive in a rapidly changing world.

These findings tie back to the existing literature presented in the state of the art. This work contributes to the broader debate surrounding the EU's strategic turn and its effect on openness in R&I. Bamberger and Huang (2025) present this as a shift from openness towards "selective closure", while Soete and Burgelman (2023) approach it as a "(re)bordering" of European research. This study shows that, within science diplomacy discourse specifically, the protective turn is better understood as a reconfiguration of openness than a break with it. The analysis also explores the duality of the field. While the cooperative approach to science diplomacy still dominates in the EU, the results show a growing recognition of the competition-based, statist view, and of the role that national interests play in science (Ruffini, 2020a). EU science diplomacy discourse increasingly frames cooperation and protection as mutually necessary, trying to find a balance between a positive-sum and a zero-sum logic.

Finally, the results of this work open several lines for future research. The Council Recommendation on a European Union framework for science diplomacy was formally adopted on 29 May 2026, offering for the first time a shared vision and a common narrative for Member States to follow (EC, 2026a). Future research should explore the extent to which, and ways in which this framework is implemented at the Member State level. A second line of research concerns the role of science diplomacy within the EEAS, the diplomatic side of science diplomacy in the EU. While this work has shown that, at the moment, science diplomacy is more consolidated within R&I discourse than within EU foreign policy discourse, this could change as efforts to institutionalize the term at the EU level continue. A final line of research is the further exploration of the EU's strategic logic itself, and whether the balance identified in this work is maintained or whether the protective logic could become stronger, or even overtake the now dominant cooperative approach. The EU reaffirms its commitment to openness and cooperation, presenting science diplomacy as a tool capable of holding these together with a growing logic of protection and strategic autonomy. Whether EU science diplomacy can sustain this balance in practice remains to be seen.

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8. APPENDICES

Appendix A. Author-created Supporting Figures and Tables

Table A1. *Corpus of Primary Documents by Phase and Category (2008–2026)*

Document / Event	Year	Phase	Category	Document Type	Issuing Body / Provenance
COM(2008) 588 — A strategic European framework for international S&T cooperation	2008 (Sep)	Baseline	A	EC Communication	EC
COM(2012) 497 — Enhancing and focusing EU international cooperation in R&I	2012 (Sep)	1	A	EC Communication	EC
Open Innovation, Open Science, Open to the World	2016	2	A	EC policy vision	EC (DG RTD; Commissioner Moedas)
Van Langenhove, "Tools for an EU Science Diplomacy" (2017)	2017	2	B	EC- commissioned expert report	EC (DG RTD; external author)
Madrid Declaration on Science Diplomacy (S4D4C, 2019)	2019	2	B	Project declaration / civil society statement	S4D4C (Horizon 2020 project)
SFIC Science Diplomacy Task Force Input Paper (2020)	2020 (Mar)	2	B	SFIC advisory input paper	SFIC (Strategic Forum for International S&T Cooperation) under the Council
COM(2021) 252 — Global Approach to Research and Innovation	2021 (May)	3	A	EC Communication	EC
Council Conclusions on the Global Approach to R&I (2021)	2021 (Sep)	3	A	Council Conclusions	Competitiveness Council
SFIC Task Force — Roadmap & Impact Pathways for an EU Science Diplomacy Agenda (2021)	2021 (Dec)	3	B	SFIC Task Force roadmap / report	SFIC Task Force under the Council
1st European Science Diplomacy Conference, Madrid	2023 (Dec)	4	B	Institutional conference/conference outcomes	EC + Spanish Council Presidency
A European Framework for Science Diplomacy — Recommendations of the EU Science Diplomacy Working Groups	2025 (Feb)	4	B	Expert report, institutionally mandated and published by EC	EC (DG RTD) + 130 experts in 5 Working Groups
2nd European Science Diplomacy Conference, Copenhagen	2025 (Dec)	4	B	Institutional conference/conference outcomes	EC + Danish Council Presidency
COM(2026) 97 — Proposal for a Council Recommendation on an EU Framework for Science Diplomacy	2026 (Feb)	4	A	EC proposal for a Council Recommendation	EC

Council Recommendation on a European Union framework for science diplomacy — Adoption (Doc. 8931/26 ADD 1; Interinstitutional File 2026/0060 (NLE))	2026 (May)	4	A	Council document: addendum containing the text of a Council Recommendation for adoption	Council of the EU, General Secretariat of the Council

***Table A2**. Evolution of functions attributed to science diplomacy across selected Phase 4 documents.* [17]

Function	Expert Report (2025)	Commission Proposal COM(2026) 97 final	Council Recommendation 8931/26 ADD 1
Values, interests, sovereignty	_	a) defending the Union's democratic values, strategic interests and technological and data sovereignty,	a) safeguarding and promoting the Union's democratic values, strategic interests and technological and data sovereignty
Competitiveness/ global S&T position	1. Strengthening Europe's competitive position as a global science and technology actor	b) strengthening the Union's competitive position as one of the leading global science and technology actors	b) strengthening the Union's position as one of the leading global science and technology actors through open and secure international scientific cooperation
Trust in science and public engagement	_	_	c) enhancing trust in science, fostering the uptake of foresight and scientific advice in decision-making processes, and promoting public engagement;
Peace, multilateralism, rules-based order	2. Maximising the deployment of European research and innovation potential for the pursuit of peace and multilateralism	c) maximising the deployment of the Union's R&I potential for the pursuit of peace and a rules-based international order, and	d) maximising the impact of the Union's research and innovation potential for the pursuit of peace, protection of human rights, multilateralism and a rule-based international order

[17] Author's own elaboration based on European Commission (2025), European Commission (2026b) and Council of the EU (2026b).

Global public goods and commons	3. Reinforcing Europe's commitment to managing global public goods and commons sustainably and achieving the Sustainable Development Goals	d) reinforcing the Union's commitment to managing global goods and commons sustainably, fighting the triple planetary crisis of climate change, biodiversity loss and pollution, and contributing to the achievement of the United Nations 2030 Agenda for Sustainable Development13 and the Sustainable Development Goals	e) reinforcing the Union's commitment to managing global public goods and commons sustainably, fighting the triple planetary crisis of climate change, biodiversity loss and pollution, and contributing to the achievement of the United Nations 2030 Agenda for Sustainable Development and the Sustainable Development Goals

Figure A1. *Cooperative and protective vocabulary in Phase 2 (2015–2020)*[18] [19]

[18] Note. Author's own elaboration; visual design supported by Claude.
[19] Size proportional to frequency across the phase.

***Figure A2**. Cooperative and protective vocabulary in Phase 3 (2021–2022)*[20]

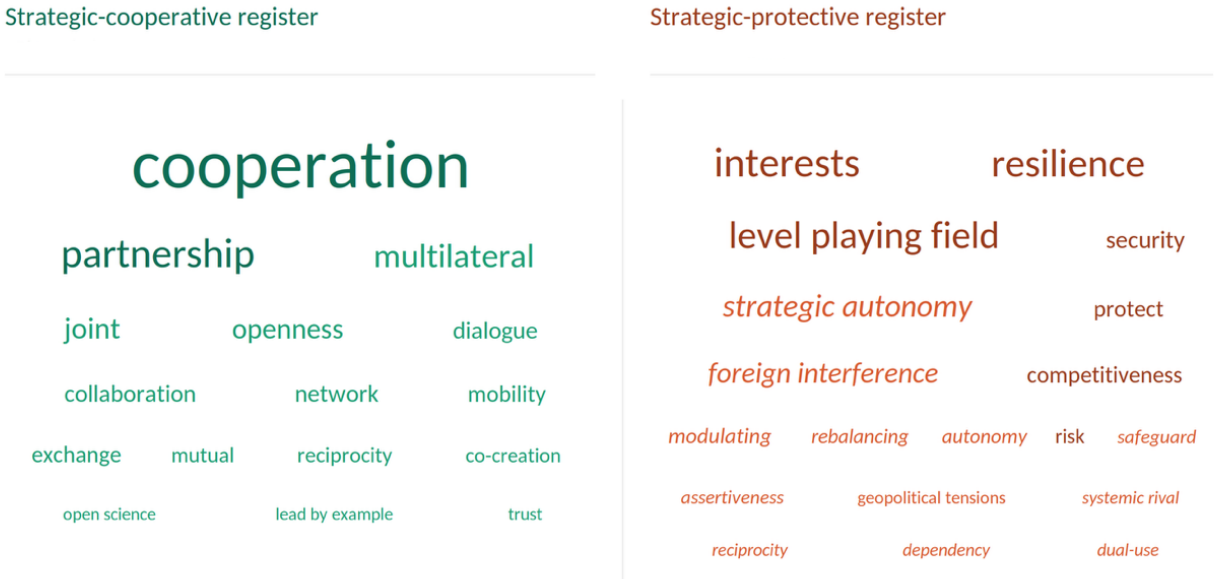
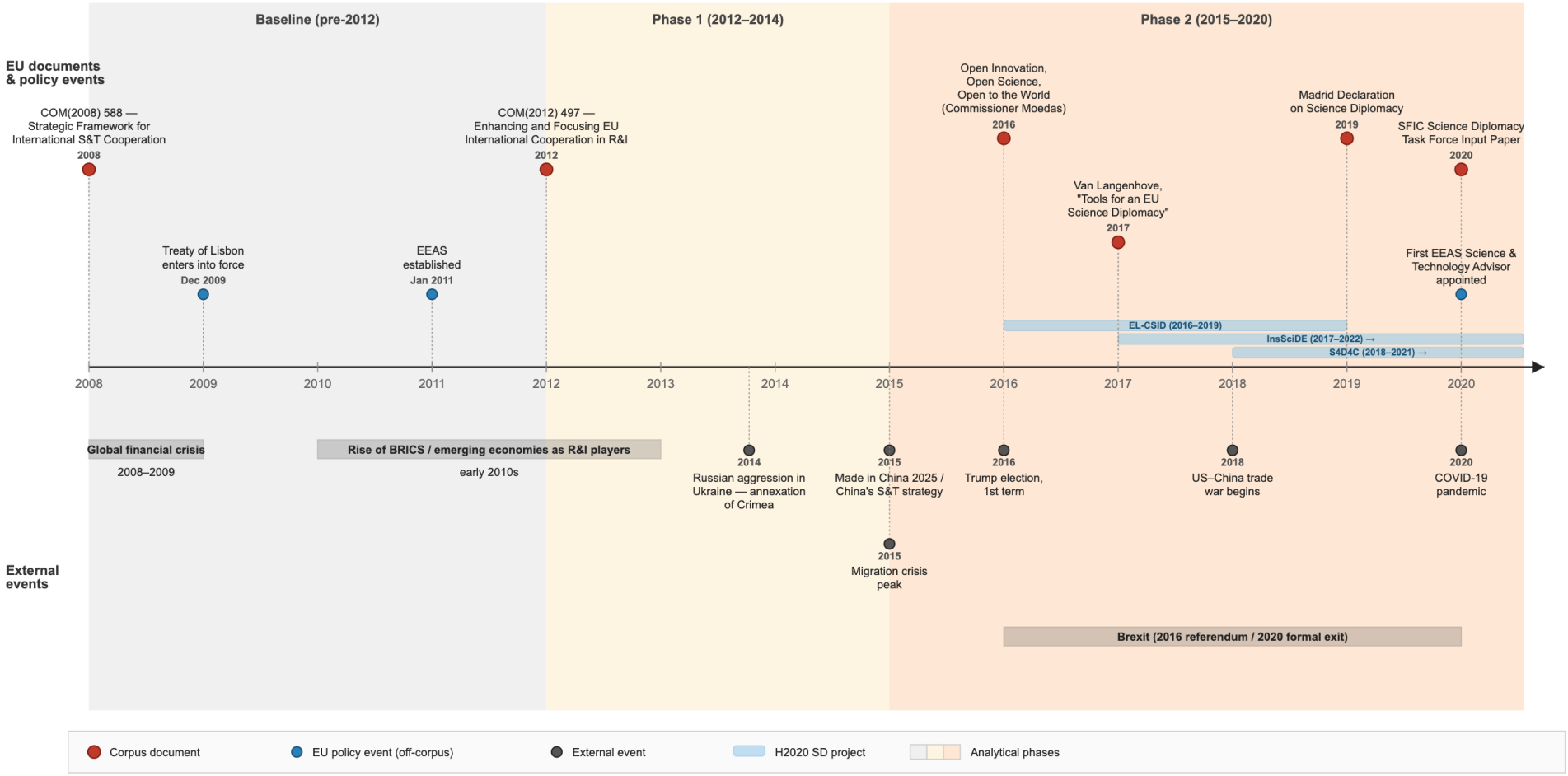


***Figure A3**. Cooperative and protective vocabulary in Phase 4 (2023–2026)*[21]

[20] Italics for newly emerging terms compared to previous phases.
[21] Central overlap section marks recurring terms where openness and protection are combined into a single phrase.

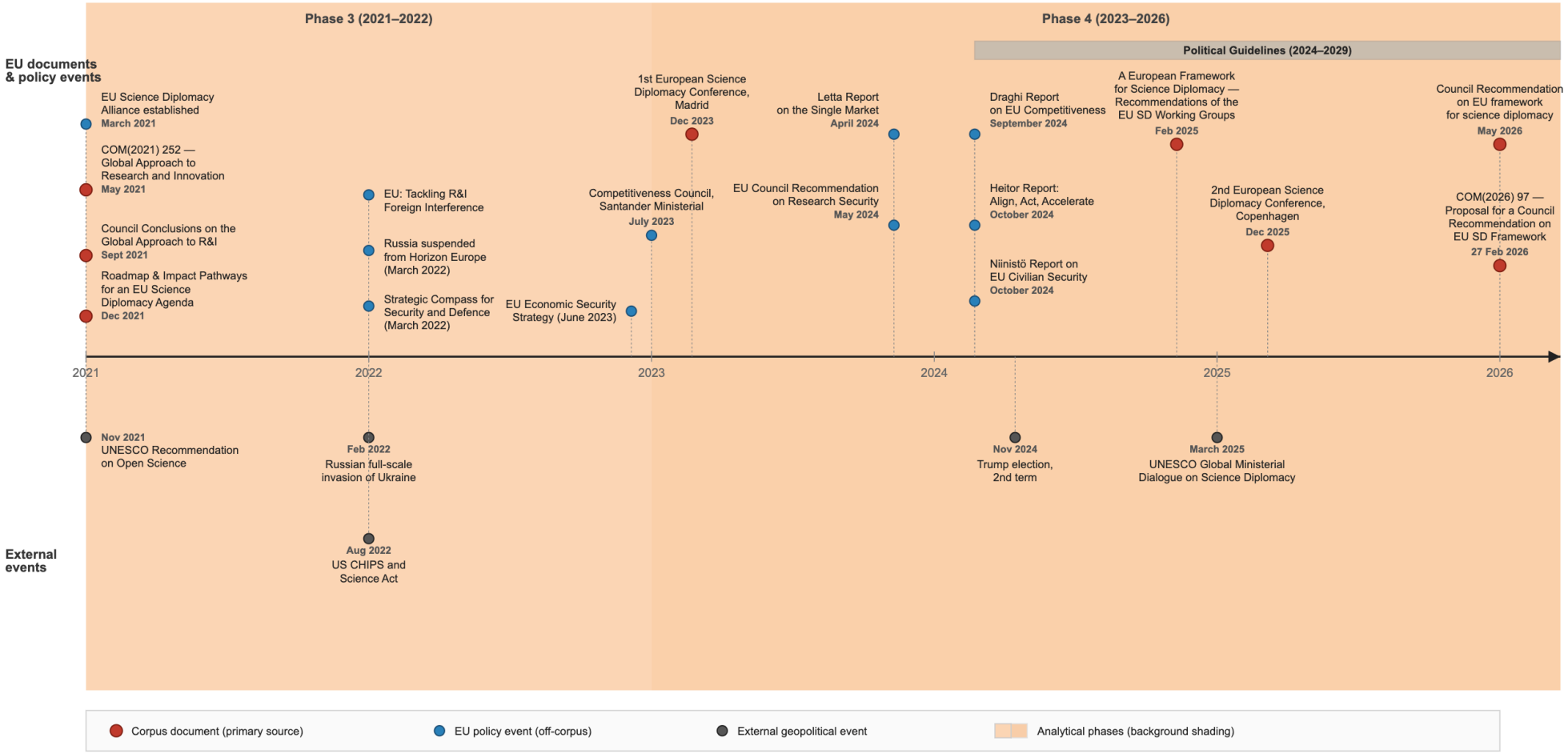
Appendix B. Timelines of EU Science Diplomacy and Contextual Events (2008–2026)

Figure B1. *EU Science Diplomacy: Baseline and Phases 1–2 (2008–2020)*[22]



[22] Both timelines were visually designed with Claude, based on the author's own document selection and analysis.

Figure B2. *EU Science Diplomacy: Phases 3–4 (2021–2026)*



Appendix C. Relevant Figures and Tables Reproduced From Corpus and Secondary Sources

Figure C1. *Taxonomy of Science Diplomacy as proposed by Gluckman et al. (2017).*[23]

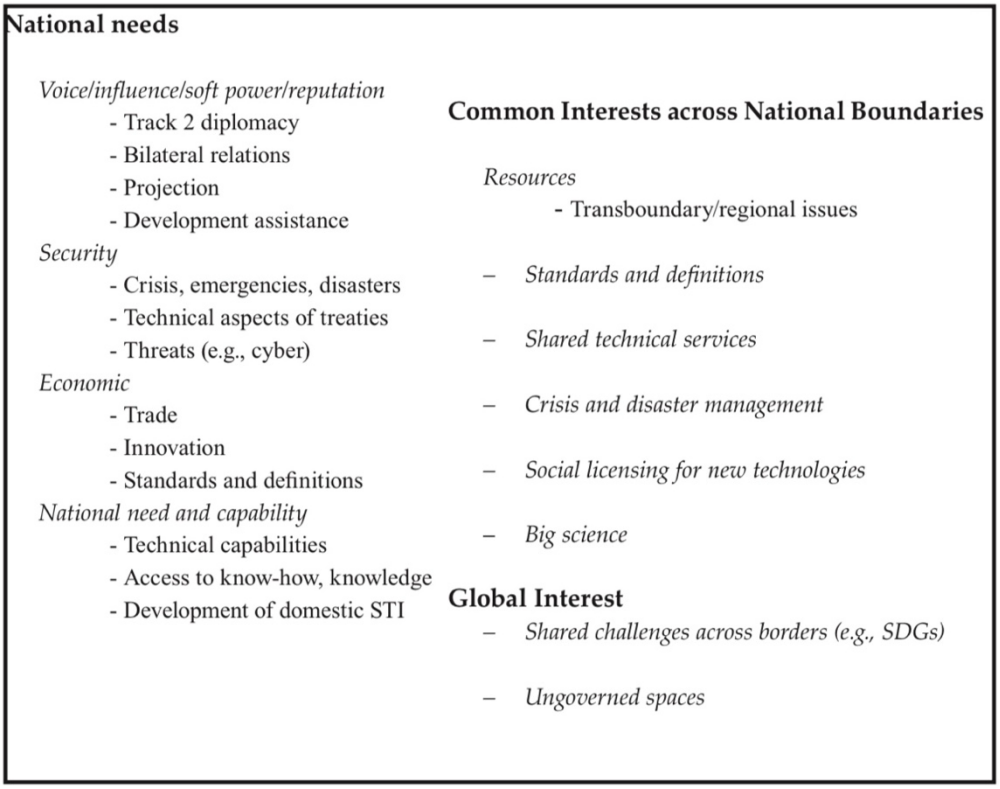
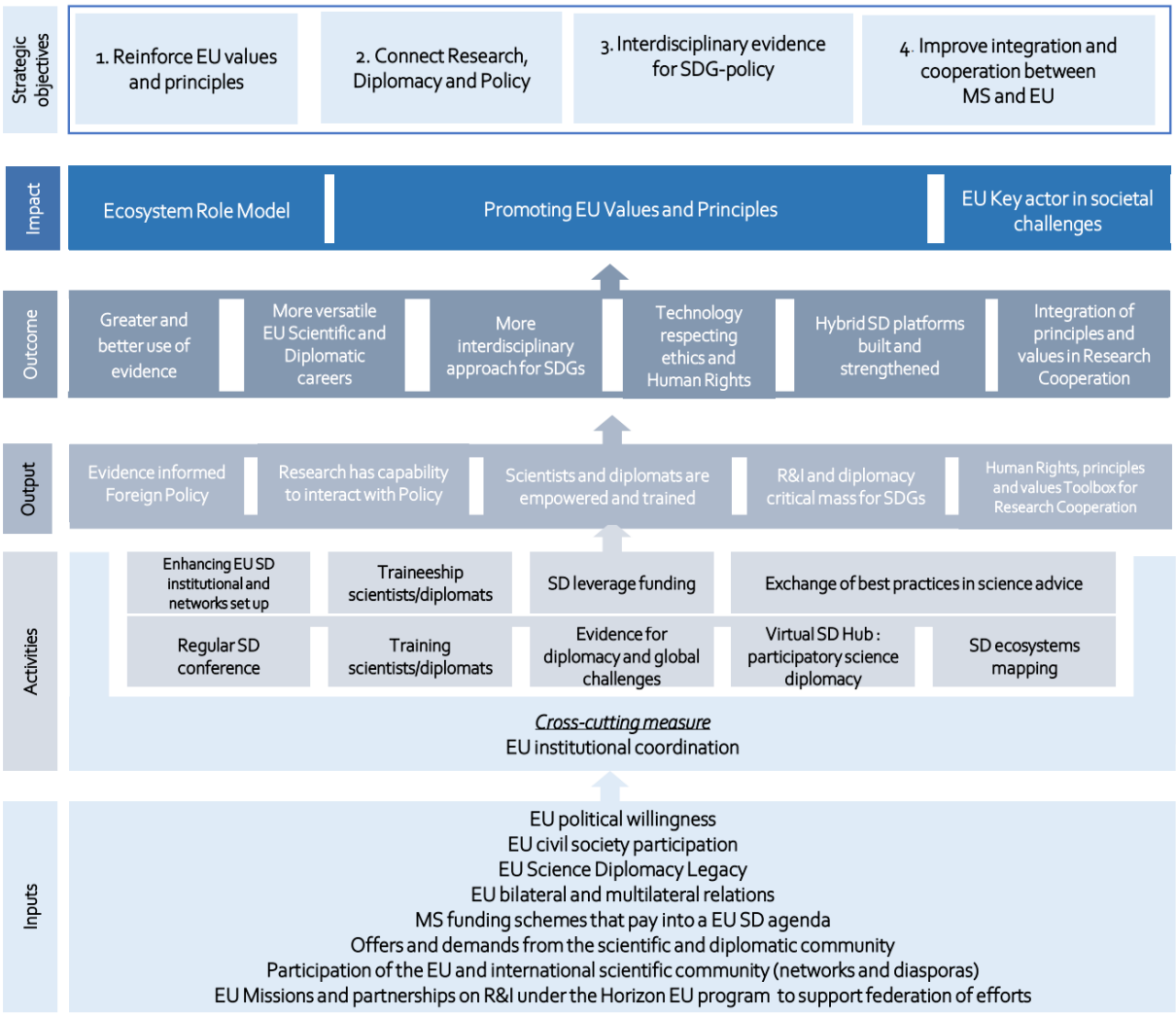


Figure C2. *Key science diplomacy activities to be implemented from the SFIC perspective*[24]

TIME FRAME	RECOMMENDED ACTION	AREA OF ACTIVITY
SHORT-TERM	**1. Inclusion of Science Diplomacy in the new EU STI International Cooperation Strategy**	**Strategic Level / European Research Area**
MEDIUM-TERM	**2. Creation of a EU platform for Science Diplomacy**	**Operational Level / Horizon Europe**
	3. Supporting the development of training activities in the area of Science Diplomacy / Science Advice as well creation of Science Diplomacy networks	**Operational Level / Horizon Europe**
LONG-TERM	**4. Development of an overall Science Diplomacy Roadmap including EU Commission, the EEAS and the Member States**	**Strategic Level / European Research Area**
	5. Organisation of an Annual European Science Diplomacy Conference including a European Science Diplomacy Award	**Operational Level / Horizon Europe**
	6. Foster the integration of Science Diplomacy aspects in national STI strategies	**Strategic & operational Level / European Research Area**

[23] From *Science Diplomacy: A Pragmatic Perspective from the Inside* (PDF version), by Gluckman et al., 2017, p. 12.
[24] From *SFIC Science Diplomacy Task Force Input Paper*, by SFIC, 2020, p. 7.

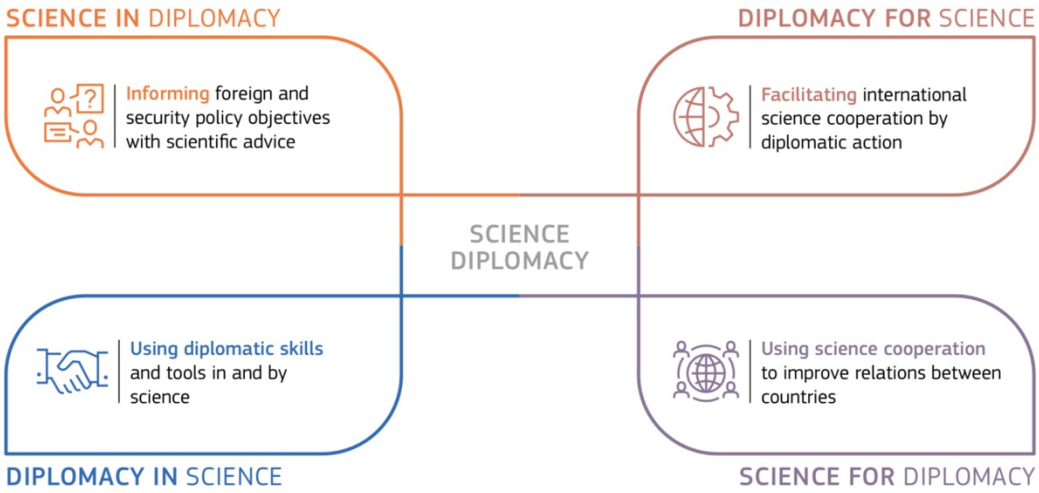
Figure C3. *Roadmap and Impact Pathway for an EU Science Diplomacy Agenda developed by SFIC.*[25]



[25] From *Roadmap and Impact Pathways for an EU Science Diplomacy Agenda*, SFIC, 2021, p. 2.

***Figure C4**. Overview of the recommendations by the EU Science Diplomacy Working Groups*[26]

***Figure C5**. Typology of science diplomacy as proposed by the Expert Report (EC, 2025)*[27]



[26] From *A European Framework for Science Diplomacy*, by European Commission, 2025, p. 9.
[27] From *A European Framework for Science Diplomacy*, by European Commission, 2025, p. 17.

Appendix D. Declaration of Use of AI

COMILLAS UNIVERSIDAD PONTIFICIA CIHS

Curso 2025/2026

ANEXO: Declaración de uso de herramientas de IA generativa

Nombre Grado/Máster:	**Grado en Relaciones Internacionales**
Nombre Alumno:	**Eva Mercado Begara**
Coordinador/a TFG/TFM:	**Belén García-Noblejas Floriano**
Nombre Director/a de TFG/TFGM:	**Carmen Chas Bartolomé**

Declaro que para la elaboración del presente Trabajo Fin de Grado / Trabajo Fin de Máster se ha utilizado inteligencia artificial generativa como herramienta de apoyo.	**SÍ**	NO

1) Uso de la IA Generativo

Si tu respuesta ha sido SÍ, contesta a las siguientes preguntas. Si has contestado NO, pasa al apartado 2.

Uso ético

	SÍ	NO
¿A la hora de usar la herramienta IA, en los *prompts* utilizados has incluido datos de carácter sensible o de carácter personal (fotos de personas reales, datos personales, etc.)? *Si tu respuesta es afirmativa especifica cuáles.*		X
¿Has orientado tu uso a suplantar tu trabajo personal sin hacer una revisión crítica de la extraído en la herramienta IA? *Si tu respuesta es afirmativa especifica cuáles.*		X
¿Has tenido en cuenta las recomendaciones académicas que te han hecho específicamente en el Grado/Máster sobre lo que está permitido o no con la IA?	X	

Uso técnico realizado:

¿Qué herramientas has utilizado (ChatGPT, Copilot, Claude, Nano Banana….)? Especifica la versión o tipo de licencia.

- ChatGPT
- Notebook LM
- Claude
- Perplexity
- Consensus

Marcar lo que corresponda:

☐ Generación de texto *(Especificar qué herramientas)* →

☒ Reformulación *(Especificar qué herramientas)* → Claude usado para detectar frases poco naturales en inglés.

☒ Traducción / corrección *(Especificar qué herramientas)* → Claude usado para detectar errores ortográficos o de formato.

☒ Sugerencia de estructura *(Especificar qué herramientas)* → ChatGPT usado para propuestas iniciales de estructura en base al reglamento, revisadas y decididas por la autora.

☐ Apoyo metodológico *(Especificar qué herramientas)* →

☒ Buscar o citar bibliografía *(Especificar qué herramientas)* → Consensus y Perplexity utilizados durante las primeras fases de investigación para encontrar fuentes para la revisión de la literatura. ChatGPT usado para formatear correctamente las citas de la bibliografía en algunos casos.

☒ Generar contenido audiovisual (videos, infografías, audios, imágenes, gráficos. *Especifica en concreto qué contenidos has generado con IA además de citarlo correctamente en el trabajo.* → Uso de Claude para el diseño visual de las nubes de palabras y de las líneas de tiempo del Anexo B.

☒ Otros *(Especificar qué herramientas)* → Notebook LM utilizado para encontrar información concreta dentro de artículos o policy documents. Fuentes siempre leídas directamente por la autora.

Confirmo que el contenido final ha sido revisado, corregido y validado íntegramente por mí como autor/a y asumo la plena responsabilidad académica del mismo.

La utilización de la IA no ha sustituido el análisis crítico, la reflexión personal ni el trabajo intelectual propio exigido en un TFG/TFM.

Firma: Eva Mercado Begara