



Leveraging Science Diplomacy in an Era of Geo-Economic Rivalry

Towards a European strategy

—
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Executive summary

Science diplomacy, a field broadly understood as activities at the intersection of science and foreign policy, is receiving increased attention. The promise is obvious: scientific advice and networks can help the world to deal better with transnational challenges, and actors to strengthen their foreign policies. At the same time, however, science and innovation are at the pinnacle of great power rivalry and fuel states' competition over markets, innovation and influence. Starting from an understanding that science diplomacy incorporates not only cooperation but also competition and conflict in the current era of geo-economic rivalry, this report offers strategic advice from a European perspective.

The report sketches out what science diplomacy can do for European foreign policy and how the European Union can strengthen its role as a science diplomacy actor. It considers five key EU foreign policy interests, and the past and present role of science diplomacy in these interests: a functioning rules-based order, addressing global challenges, a resilient neighbourhood, the security and well-being of its citizens, and the strategic autonomy of the Union.

A number of objectives with related policy recommendations are suggested to enable EU foreign policy to be better served by science diplomacy:

- **Strengthen a free and vibrant European scientific community** –the “home base” of science is a prerequisite for successful science diplomacy.
- **Agree principles on scientific cooperation in an era of regime divergence and competition** –a path between unfettered cooperation and scientific decoupling can be established towards relations with non-democracies.
- **Foster capabilities and a culture of scientific advice in foreign policymaking** –the EU foreign policy machinery can be adapted to make better use of science and scientific advice.
- **Increase the cohesion of EU level efforts** –the European Commission, the External Action Service and other EU actors can coordinate better on common goals.
- **Increase the cohesion of EU and member state efforts** –coordination can be facilitated on the diverse efforts by the EU and member states.
- **Leverage potential science diplomacy stakeholders** –bridges to and joint platforms with the full ecosystem of science diplomacy actors can be established while still respecting their different roles.

Science diplomacy is an area with great potential, especially for the EU. It is also an area with inherent tensions: between academic freedom and the instrumentalisation of science, between the gains of international cooperation and the risks it entails, and between public goods and national gains. A European science diplomacy strategy must bridge these tensions and balance different interests. The history of science diplomacy can be of help in so doing, linking past experience with present policy ambitions to strengthen European science diplomacy for the future.



Introduction

Science diplomacy is broadly understood as activities at the intersection of science and foreign policy.¹ As science and innovation play increasingly central roles in the management of transnational challenges, and also in great power rivalry, Europe needs to think hard about how best to make use of and develop the science diplomacy nexus. This report discusses what modern science diplomacy is, how it is affected by current geo-economic rivalries, the European foreign policy goals that science diplomacy could serve and how this field could be further developed in Europe. It ends by suggesting strategic objectives – what the EU and its member states could do to develop its science diplomacy but also what scientists and experts and other stakeholders should consider when engaging in science diplomacy activities.

Conceptualising science diplomacy in a geo-economic era

Any discussion of a European science diplomacy strategy requires a discussion of science diplomacy and its constituent elements. Making use of nascent research on science diplomacy, as well as the thinking on power, diplomacy and foreign policy within international relations (IR), this section aims to situate the basic concepts used in the

¹ This report constitutes Deliverable 2.6, “Final ESD-STRATEGY: European Science Diplomacy Strategy and Agreed Practitioner Recommendations” of the project InsSciDE – Inventing a shared science diplomacy for Europe. InsSciDE has benefitted from funding by Horizon 2020, the European Union’s Research and Innovation programme (grant agreement no. 770523, 2017-2022). The author would like to thank Swapnil Vashishta for her research assistance, Rasmus Gjedssø Bertelsen for stimulating cooperation, Claire Mays for careful reading, and InsSciDE researchers for their comments and reflection. Thanks go as well to practitioners from the EU’s Joint Research Centre, the Strategic Forum for International Scientific and Technological

report and to link these to ongoing changes in the international order.

Science diplomacy: the use of science for foreign policy purposes

Science diplomacy is a rather novel concept that tries to capture an old phenomenon: the various linkages that exist between science and diplomacy. This report narrows down this wide nexus between science and foreign policy into a more instrumental definition: *the use of science for foreign policy purposes*. This departs slightly from common framings of the concept that depict possible practices of science diplomacy such as *Science in diplomacy* (where science and scientific expertise are employed to support and strengthen foreign policy endeavours), *Diplomacy for science* (where states pursue or facilitate international scientific cooperation) and *Science for diplomacy* (where scientific networks are instrumentalised to build international networks and epistemic communities that enable backchannel diplomacy).² While such categorisations are useful when presenting various scientific practices, they have limits for guiding strategy and policy. They say little about the interests, motivations or goals of the actors involved, and are heavily influenced by what self-perceived science diplomats did or wanted to do when this conceptualisation was formulated in the 2010s.³ In addition, as a taxonomy of

Cooperation, Sweden’s innovation agency, Vinnova, and the European External Action Service for their insights and discussions with the author during the writing of this report.

² Royal Society and American Association for the Advancement of Science (2010). *New frontiers in science diplomacy: navigating the changing frontiers*. London, January, <https://royalsociety.org/-/media/royal_society_content/policy/publications/2010/4294969468.pdf>.

³ The focus on global challenges and track 2 diplomacy echoes the major concerns with the global commons and the closed “rough state” such as North



practices, the triad of categories is rather asymmetric. It mingles one (potentially huge) area of governmental support for science with the quite different questions of scientific advice and expertise within diplomacy or the fairly confined use of scientific networks as channels of communication. For these various reasons, I employ the more straightforward definition *the use of science for foreign policy purposes*, while not ruling out that this might incorporate practices of the triad as long as they are conscious acts linking science to the furthering of foreign policy goals. This instrumental use of the term from a policymaking perspective should be seen not as a normative stance, but rather as an analytical choice. Indeed, enrolled experts and scientists as well as other stakeholders need to consider their role in a form of diplomacy that largely serves state interests.

Science diplomacy is as good as the science and the diplomacy it serves

Understanding science diplomacy demands a critical understanding of its two constituent parts: science and diplomacy. A major problem with the burgeoning literature on the interdisciplinary area of science diplomacy is its inadequate understanding of at least one of these entities. Moreover, the role of power is frequently omitted with regard to both science and diplomacy. Indeed, the EU Strategic Forum for International S&T Cooperation (SFIC) Task Force on Science Diplomacy notes that “there is an urgent need to get out of the naïve mainstream

discourse on science diplomacy, driven by the idealism and internationalism of science”.⁴

Science is sometimes characterised as neutral or – in slight contrast – as a force for good.⁵ Science diplomacy scholar Tim Flink notes the almost miraculous functioning and good nature of science diplomacy, as depicted in the nascent literature on the subject.⁶ The report by the Royal Society that introduces the above-mentioned triad claims that “Science provides a non-ideological environment for the participation and free exchange of ideas between people, regardless of cultural, national or religious backgrounds”. From this perspective, adding science to diplomacy could result in more informed and/or better decision making. While this might be the case, the Royal Society proposition largely omits critical insights from Science and Technology Studies and from history on how science and the production of knowledge are intrinsically linked to power. Missing or underestimated in the debate among practitioners, according to Pierre-Bruno Ruffini, are the power relations between states and the rationale for competition within science diplomacy.⁷ The proposition also omits current reporting on the increasing political control over science and research in authoritarian systems or by authoritarian leaders, which in practice makes it impossible for these scientific entities to function as a “non-ideological environment”. For example, Hungary’s Victor Orban in 2019 forced the Central European University into

Korea that permeated the international security debate in the first decade of the century.

⁴ SFIC Task Force on Science Diplomacy working paper, “Anchoring science diplomacy in Horizon Europe: Developing specific subjects and activities”, Brussels, 21 September 2020.

⁵ For a discussion, see Ruffini, P.-B. (2020). “Conceptualizing science diplomacy in the practitioner-driven literature: a critical review”,

Humanities and Social Science Communications, 7(1), 124; and Flink, T. (2020). “The sensationalist discourse of science diplomacy: a critical reflection”, *The Hague Journal of Diplomacy*, 15(3), 359–370

⁶ Flink, T. (2021). “Why science diplomacy needs evaluative backing”, *S4D4C Policy Brief* (Feb.), p. 5.

⁷ Ruffini, P.-B., “Conceptualizing science diplomacy in the practitioner-driven literature”.



exile only to offer in 2021 a subsidy for the Chinese Fudan university to settle in Budapest – a University that recently felt obliged to issue a public statement of adherence to the leadership of the Chinese Communist Party and a commitment to fully implement the party’s education policy.⁸ While a product of science, such as formulated knowledge, might be neutral, the process of attaining that knowledge and the use of it rarely are. Funding, hiring, quality control and academic gatekeeping are all processes affected by societal trends and developments, even in democracies and open societies.

The link between power and scientific knowledge should not lead to relativism and a renunciation of the role of science diplomacy, nor of the provision of scientific advice to other sectors. Nonetheless, it is a strong argument for self-awareness and a critical understanding of the power of knowledge production, in order to strengthen the value of scientific advice in general and the role of science in science diplomacy in particular. The historical case studies at the core of the InsSciDE project⁹ can provide a basis for such scientific self-reflection.

Diplomacy too is a contested concept. Despite being a tool of power, perhaps because it is often contrasted with war – “give diplomacy a chance” is sometimes used in the same sense as “give peace a chance” – diplomacy is surprisingly often seen through a normative lens as an activity driven by an endogenous ethic of benevolence. Diplomacy, however, is a form of statecraft and thus aims to secure many of

the same interests as the other means available to a state or state-like actor. To continue with the war analogy, diplomacy and military action are tools that are often used in tandem, for example, to enable military action through alliance building, to legitimise military action through international legal negotiations or to build states up following military action. For instance, the role of the US State Department and how US diplomacy was missionised and adapted to the work of the US Department of Defence during the long “War on Terror” are indicative of how diplomacy is an instrument of interests, whether those interests are power projection, peace, security or wealth.¹⁰

Understanding that science, diplomacy and, hence, science diplomacy are all activities that exist *within* power structures does not exclude the possibility that they might also be a force for good, but this cannot be presupposed. Science diplomacy is a means that serves multiple ends; it is not an end in itself. A solid analysis of science diplomacy must therefore take as its starting point the actors involved and the interests they have.

Science and innovation in geo-economic conflict

Supporters of science diplomacy usually highlight the public goods that science diplomacy can generate. The research portal representing the EU Science Diplomacy Alliance, science-diplomacy.eu, for example suggests in its introduction to the field that SD “can help to address global challenges, promote understanding, and increase influence and prosperity”.¹¹ While this is

⁸ Hopkins, V., “Chinese university to open Budapest campus as Orban tilts to Beijing”, *Financial Times*, 18 January 2021.

⁹ The case studies are available at <https://www.insscide.eu/results/publications/>.

¹⁰ Burns, William J. and Thomas-Greenfield, Linda (2020). “The transformation of diplomacy: How

to save the State Department”, *Foreign Affairs* (November/December).

¹¹ See <<https://www.science-diplomacy.eu/>>, accessed 11 January 2022. “The EU Science Diplomacy Alliance is a collaborative initiative launched by the Horizon 2020 science diplomacy projects S4D4C, InsSciDE and EL-CSID to sustain and



certainly true, it is also true that science, and the use of science, is increasingly being weaponised as a strategic tool to secure national interests and power, and for leverage in interstate rivalry. As historians of science point out, this duality is nothing new. However, the way that science and innovation are currently employed as tools in geo-economic¹² conflicts conditions how they can be used for more general public goods, as discussed below.

During the Cold War era, science and innovation functioned as both a field of great power rivalry – think of the efforts of attaining nuclear or space capacities – and to some extent a way of mitigating conflict and lack of communication. On both sides, science was massively supported by public funding and much innovation originated in the state military sectors, from where it made its way to civil uses.¹³

In the post-Cold War era, science and innovation were internationalised in much the same way as other aspects of society, at least in the West. Less public funding went into large scientific programmes and innovation was increasingly consumer-driven.¹⁴ The geopolitical ambition of international R&D activities was that these should facilitate and accelerate convergence towards liberal democracy by way of both processes (societal and professional interaction) and results (development and prosperity increasing demands for democratisation). The idea that scientific advice would alleviate some of the non-antagonistic global challenges facing the

world, such as global warming or space debris, aligned with this ambition.

The era of liberal globalisation has for some time been challenged and overlaid with a return to the geopolitical logic of conflict. The forces of liberal globalisation are still strong, but they play out in parallel with states' seeking to advance their power by controlling resources, economic production and other levers of traditional statecraft. In this new logic, much power rivalry is taking place in science, technology and economic transactions that merit the term "geo-economic rivalry". There are several reasons why today's conflicts to a large extent play out in the geo-economic domain with huge consequences for science and innovation. The root structural causes are the end of the unilateral US order and the rise of China as a systemic rival. China's rise has been principally based on developments in these fields rather than on hard power alone. It is therefore unsurprising that this is where China will challenge the US. China's "Made in China 2025" strategy and its successors have been explicit on the aim of establishing China as a dominant power in the area of critical technologies, science and innovation. In addition, as China has made no substantial move towards liberal democracy, Western states are becoming increasingly unwilling to accept Chinese behaviours such as intellectual property rights (IPR) infringements, forced innovation transfers and industrial espionage. Because neither the US nor China – nor indeed their domestic audiences – are keen to see their rivalry play out in the military field, a long game of

grow the networks, impact and momentum consolidated by the three projects."

¹² In this report, geo-economics is related to spatial flows, the distribution of investments, information, infrastructure and innovation, and the impact these have on the strategic behaviour of states.

¹³ For an overview, see Oreskes, N. and Krige, J. (eds). *Science and Technology in the Global Cold War* (Cambridge, MA: MIT Press, 2014).

¹⁴ For example, US federal spending on research and development fell from 1.2% of GDP in 1976 to 0.7% in 2019, see the AAAS historical R&D budget dashboard available at <https://www.aaas.org/programs/r-d-budget-and-policy/historical-trends-federal-rd>



conflict in the areas of markets, science and innovation is to be expected: an era of geo-economic rivalry.

This geo-economic turn implies that interdependence or “connectivity”, instead of alleviating conflict – as was hoped for during the liberal globalisation era – now locks actors into risky vulnerabilities that can be turned into influence.¹⁵ Both China and the US have embarked on ambitious programmes to boost their own innovation systems and become less dependent on those of their competitors. This policy of decoupling has had effects on everything from semiconductors to high-end research and innovation systems.

Other actors, such as the EU, have had to follow suit and manage their interdependencies and perceived vulnerabilities under the broad goal of achieving autonomy and/or sovereignty. As the European Commission notes in its recent Communication on the EU’s Global Approach to Research and Innovation: “Competition for technological leadership drives certain non-EU countries to adopt restrictive or discriminatory measures that are unfair to EU innovators, companies and in particular start-ups. At the same time, foreign interference can compromise the integrity and autonomy on which research and innovation systems in the EU are built”.¹⁶

The ambition of European autonomy has thus spread from the security field where it originated and now applies to the economy, the digital sphere, public health and – as

indicated in the above quote – research. In relation to the latter, the European Commission argues that the new Horizon research and innovation funding programme “will strengthen our knowledge base through frontier research, spur breakthrough innovation and support the development and demonstration of innovative solutions, and it will help restore our industrial leadership and open strategic autonomy”.¹⁷ The European Council has embraced this geopolitical dimension of international research and innovation policy and is pressing hard for reciprocity and level playing fields in relation to other actors.¹⁸ The aim that research should spearhead ambitions for European autonomy has been a leitmotif in the area of defence cooperation where the new European Defence Fund is now set to fund research and development (R&D) worth €7.953 million in the period 2021–2027.

The fact that science and innovation today are on the frontline of great power rivalry affects the way Europe could and should engage in science diplomacy, and the range of foreign policy goals that it might serve.

What science diplomacy could do for European foreign policy

The practice of different forms of science diplomacy has a long history in Europe: from Portuguese zoologist José Vicente Barbosa du Bocage, whose scientific networks leveraged Portugal’s power in colonial Africa,¹⁹ to Swedish archaeologist and

¹⁵ For an overview, see Drezner, D. W., Farrell, H. and Newman, A. L. (eds). *The Uses and Abuses of Weaponized Interdependence* (Brookings Institution Press, 2021); and Leonard, M., *The Age of Unpeace: How Connectivity Causes Conflict* (Transworld Publisher, 2021).

¹⁶ European Commission (2021). Global approach to Research and Innovation: Europe’s strategy for international cooperation in a changing world. Brussels.

¹⁷ Horizon Europe strategic plan, 2021–2024, analysis available at <https://ec.europa.eu/info/files/horizon-europe-strategic-plan-2021-2024-analysis_en>.

¹⁸ European Council (2021). Council Conclusions on “Global approach to Research and Innovation: Europe’s strategy for international cooperation in a changing world”, 3813th meeting, 28 September.

¹⁹ Gamito-Marques, Daniel, (2020). “Science for competition among powers: Geographical



geologist Johan Gunnar Andersson who during the First World War used his scholarly work on China to push the exploitative interests of Swedish industry and the foreign policy establishment.²⁰

The application of science diplomacy in modern Europe can be traced back as far as the end of the Second World War, when scientific research played a key role in fostering peace and building new ties between European nations. The term had been used only loosely, however, until the former EU Commissioner for Research, Science and Innovation, Carlos Moedas, marked a key turning point by explicitly introducing the concept to EU strategy. Throughout his term as Commissioner (2014–19), he emphasised the use of science diplomacy to boost scientific competitiveness, its significance in illustrating European values globally, its potential for addressing global challenges and its power to accommodate a rules-based order.²¹ His concerns focused primarily on the EU's decelerating scientific competitiveness and shrinking collaboration, while noting that "scientific method is becoming an open, collaborative and participative process". He translated these goals and concerns into three strategic priorities: open innovation, open science and openness to the world.²² Today, the geopolitical and geo-economic turn in world politics has made a clear mark on EU ambitions for international research and

innovation policies, and for science diplomacy. The European Council has suggested a new guiding principle of being "as open as possible, as closed as necessary" and clearly links these activities to Europe's autonomy from dependencies and foreign influence.²³ A 2022 European Commission Staff Working Document on tackling R&I foreign interference suggests following up with concrete suggestions on how research and education institutions could put this into practice.²⁴

While various parts of the EU machinery have made use of the science diplomacy concept, less has been done to align the EU's nascent science diplomacy with its foreign policy. This must be the ultimate goal of any EU science diplomacy strategy.

If science diplomacy is defined as *the use of science for foreign policy purposes*, what are these purposes seen from a European perspective? To find common ground and work towards a shared European science diplomacy, a natural point of departure would be the general and agreed interests of the actors involved. In this context, a shared European science diplomacy should be based on what Europeans have set out to do together in the foreign policy arena. These overarching European foreign policy interests can be derived from the treaties, the main priorities of the European Union Global Strategy (EUGS) and the 2022 EU strategic compass.²⁵ Based on the interests

knowledge, colonial-diplomatic networks, and the scramble for Africa", *Berichte zur Wissenschaftsgeschichte* 43(4), 473–492, as well as his short-form case study forthcoming here:

<https://www.insscide.eu/results/publications/>

²⁰ Högselius, Per and Yunwei Song (2021).

"Extractive visions: Sweden's quest for China's natural resources, 1913–1917", *Scandinavian Economic History Review*, 69(2), 158–176.

²¹ Moedas, C. (2016). Science Diplomacy in the European Union, 29 March.

²² European Commission (2015). Open Innovation, Open Science, Open to the World.

²³ European Council (2021). Council conclusions on "Global Approach to Research and Innovation: Europe's Strategy for International Cooperation in a Changing World", 3813th meeting, 28 September.

²⁴ European Commission (2022). Directorate-General for Research and Innovation, "Tackling R&I foreign interference", staff working document.

²⁵ One starting point for deriving European interests would be to consider the goals of the European Union. Article 2 of the Common Provisions of the Treaty on European Union lists "respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights, including the



and priorities of these documents, and recognising that the “EU’s actions on the international stage shall be guided by the same principles that inspired its own creation”²⁶, these strategic statements converge on 5 priority areas of EU foreign policy:

- a) A functioning rules-based order
- b) Addressing global challenges
- c) A resilient neighbourhood
- d) Security and well-being of Europeans
- e) EU strategic autonomy

These overarching foreign policy interests can be characterised as: *systemic*, the kind of structure of interaction that Europe seeks to develop or the rules of the game; *substantive*, the outcomes that Europe seeks from interaction or the outcome of the game; and *actor-oriented*, the sort of player Europe seeks to be. I analyse these interests one by one below, and suggest the issues that arise for a corresponding European science diplomacy strategy.

rights of persons belonging to minorities” as common values. Article 3.1 establishes the aim of promoting these values, as well as peace and the well-being of its people, as the main purpose of the European Union. Article 3.5 adds that: “In its relations with the wider world, the Union shall uphold and promote its values and interests and contribute to the protection of its citizens”. Some further guidance is offered in the General Provisions on the EU’s External Action in the Treaty on European Union. Article 21.1 first reiterates that the EU’s actions on the international stage should be guided by the same principles that inspired its own creation. It then offers a “to-do list” (art. 21, a–h) that covers everything from abstract values (again) to somewhat more concrete tasks, such as the abolition of trade restrictions, providing assistance to those confronted by natural or human-induced disasters, eradicating poverty and promoting multilateralism.

²⁶ Treaty on European Union, article 21:1

²⁷ The liberal world order is a term for the collection of norms, rules, institutions and hierarchies that have surrounded and shaped international

A functioning rules-based order

Europe’s main strategic objective of a systemic nature is undoubtedly to restore and reinvigorate a rules-based multilateral order. This need was highlighted in both the 2003 EU Security Strategy and the 2016 EUGS but has become even more pressing today. This is a difficult task as shifting global power balances need to be reflected in any sustainable multilateral architecture. The EU has been a benefactor of the post-1945 order and the way it has developed under US hegemony.²⁷ The EU has also been an ardent reformer of the system, pushing it in a more liberal and post-Westphalian direction, for example by empowering international institutions and limiting state sovereignty through support for the Responsibility to Protect and the workings of the International Criminal Court.²⁸

As noted above, the short unilateral era is now drawing to a close and China is challenging US dominance. In several domains, such as technology,²⁹ innovation³⁰ and space,³¹ the world is moving towards multipolarity and more or less open power

politics since the end of World War II; Bull, H (1977). “War and international order.” The Anarchical Society. Palgrave, London

²⁸ Fägersten B. (2020). “European Autonomy in a Changing World Order”. In: Bakardjieva Engelbrekt, A., Bremberg, N., Michalski, A. and Oxelheim, L. (eds). *The European Union in a Changing World Order* (Cham: Palgrave Macmillan).

²⁹ See e.g. Breitenbauch, H. and Liebetrau, T. (2021). *Technology Competition: Strategic Implications for the West and Denmark, 2021* (Copenhagen: Djøf Publishing and The Centre for Military Studies).

³⁰ Andrew B. Kennedy, Darren J. Lim, The innovation imperative: technology and US–China rivalry in the twenty-first century, *International Affairs*, Volume 94, Issue 3, May 2018, Pages 553–572

³¹ See Posaner, J. and Leali, G. (2022). “America’s new Moonshot: Getting Europe to sign up to its space rules”, *Politico*, 4 January, <<https://www.politico.eu/article/space-rules-us-france-germany-europe-moon/>>.



rivalry. In the regulation of high technology, the US–Chinese rivalry risks fragmenting established structures such as the multilateral standard setting frameworks and the WTO.³² In areas where rivalry is intense, processes of decoupling have been set in motion, essentially fragmenting and disputing the flows of innovation, data, money and trade that were facilitated by the post-cold war era of liberal globalisation. If these trends continue, especially at the macroeconomic and political levels,³³ it will be difficult to sustain effective multilateral cooperation arrangements. The question that arises for an EU science diplomacy strategy is: how can science diplomacy deliver an international order favourable to EU interests and values?

History offers some experience, especially on how science diplomacy can be used to build trust among actors in an otherwise fraught relationship. Such trust has the potential to reduce the risk of conflict, and to enable and facilitate functioning structures of order at the global level. The international space mission Apollo-Soyuz between the Soviet Union and the US was seen as a “handshake in space” in 1975, and prior space cooperation between France and the Soviet Union served the aim of rapprochement in an otherwise tense diplomatic climate.³⁴

Addressing global challenges

Moving from structural to substantive objectives, addressing global challenges is a core ambition of European foreign policy.³⁵ Addressing transnational issues within Europe is the *raison d’être* of the EU, which makes doing so on a global basis a key area of EU foreign policy. As indicated above, the treaties stipulate that the EU’s action on the international stage should be guided by the same principles that inspired its own creation. Transnational challenges on a global scale affect a range of countries and regions, as well as the shared spaces often described as the global commons, such as oceans, outer space, the atmosphere/environment, the polar regions and cyberspace. Systemic power rivalry, however, has fairly fundamentally altered the narrative on global challenges in the second decade of the 21st century. While a longstanding narrative invoked global commons being left with inadequate governance, or being used without consideration for others³⁶, recent events suggest that the global commons such as space, the maritime domain and the internet are increasingly being weaponised and instrumentalised in state conflicts and power rivalries.³⁷

The 2015 Sustainable Development Goals (SDGs) form a global policy agenda related

³² Rühlig, T., (2021). “China, Europe and the new power competition over technical standards”, *UI Brief*.

³³ “Decoupling: Severed Ties and Patchwork Globalisation” a report by the European Chamber of Commerce in China in partnership with MERICS, differentiates between decoupling in the macro, trade, innovation and digital domains, see <<https://merics.org/en/report/decoupling-severed-ties-and-patchwork-globalisation>>.

³⁴ See the forthcoming research by Olga Dubrovina for InsSciDE: “Space diplomacy in the Cold War context”, <<https://www.insscide.eu/results/publications/>>.

³⁵ While transnational problem-solving can be a product of the global system, it makes analytical

sense to separate the structure of international relations (discussed under the heading “A rules-based international order”) and the ability of international actors to address common challenges.

³⁶ The S4D4C project investigated the role of science diplomacy under these conditions, see for example “Calling for a Systemic Change Towards a European Union Science Diplomacy for Addressing Global Challenges”, Version 2.0, February 2021.

³⁷ For an overview of this trend and its European ramifications, see the EUISS report “Contested global commons: A multidimensional issue for the Strategic Compass”, 12 March 2021.



to a set of global challenges and the EU has pledged to implement the related targets in all policy areas. The wide spectrum of the 17 SDGs has made policy coherence a prime EU ambition when addressing them. The EUGS states that: “The SDGs also encourage us to expand and apply the principle of policy coherence for development to other policy areas, and encourage joint analysis and engagement across Commission services, institutions and Member States”.

Science diplomacy has a fundamental role in addressing these challenges, primarily since complex policy problems need scientific expertise to be managed. The EU has proposed that it “leverage its role as a global powerhouse in research and innovation to ensure that multilateral action is informed by the best possible scientific evidence”.³⁸ Global warming and the role of the Intergovernmental Panel on Climate Change (IPCC) is a current example of the need for scientific input into policymaking, but this demand extends to other issues as well. Nuclear cooperation between the International Atomic Energy Agency (IAEA), France, the US and Morocco is one example of scientific cooperation that also addresses the global risk of nuclear proliferation, while international fusion research in the ITER project addresses the scarcity of clean energy resources.³⁹

A resilient neighbourhood

Concern over and ambitions for the EU’s neighbourhood have long been important priorities in EU foreign policy. The tone and the level of ambition, however, have changed over time. The 2003 Security Strategy envisaged the neighbourhood as a ring of well governed countries with which the EU could enjoy close and cooperative relations.⁴⁰ However, the difficulties the EU faced in attempting to manage the fallout from the 2011 Arab Spring uprisings, and the protracted conflicts that followed, had produced an arc of instability rather than a ring of friends around its borders a decade after publication of the security strategy. The crisis of European migration management again pinpointed the need for neighbourhood engagement and the 2016 EUGS suggests resilience building as a somewhat vague alternative to either traditional stability or the more transformational democracy support: “It is in the interests of our citizens to invest in the resilience of states and societies to the east stretching into Central Asia, and south down to Central Africa. Fragility beyond our borders threatens all our vital interests. By contrast, resilience – the ability of states and societies to reform, and thereby withstand and recover from internal and external crises – benefits us and countries in our surrounding regions, sowing the seeds for sustainable growth and vibrant societies”.⁴¹ The European Commission 2021 Trade Policy Review identifies “stability and

³⁸ European Commission (2021). Joint Communication to the European Parliament and the Council on Strengthening the EU’s contribution to rules-based multilateralism, Join/2021/3 final, Brussels, 17 February.

³⁹ For InsSciDE case research on these topics, see Åberg, A., (2021). “The ways and means of ITER: Reciprocity and compromise in fusion science diplomacy”. *History and Technology*, 37(1), 106–124; and Adamson, M. (2021). “Orphaned atoms: The first Moroccan reactor and the frameworks of nuclear

diplomacy”, *Centaurus* 63(2), 262–276, as well as their short-form case studies forthcoming here:

<https://www.insscide.eu/results/publications/>

⁴⁰ Council of the European Union (2003). *European Security Strategy*, 15895/03, Brussels.

⁴¹ European Commission and EEAS, *Shared Vision, Common Action: A Stronger Europe, A Global Strategy for the European Union’s Foreign And Security Policy*, June 2016, <https://eeas.europa.eu/archives/docs/top_stories/pdf/eugs_review_web.pdf>.



prosperity in the EU's neighbouring countries" as a vital interest.⁴²

Science diplomacy can support this European objective by making scientific and technological results and networks available to states and organisations in the EU's vicinity. In one example discussed by the European Council and in an SFIC Working Paper on the various Team Europe Initiatives (TEIs) that pool together European resources to fund initiatives in the African Union member states, a recent investment of €1bn to manufacture health technologies, vaccines and medicines aims to stabilise the EU's neighbouring nations in the South.^{43 44} In addition, the Council stresses the importance of using neighbourhood policy tools to build capacity in partner countries in the field of education, research and innovation.⁴⁵ Historically, science diplomacy activities have furthered this goal in several ways, such as through archaeological work in the Middle East and North Africa which has the potential to build mutual and shared knowledge and to keep inter-regional cooperation alive during conflicts.⁴⁶

Security and well-being of Europeans

The peace and well-being of Europe's people form a central substantive goal in the

treaties as well as in EU foreign policy strategy. Both peace and well-being have domestic as well as foreign policy implications. Internally, an "ever closer Union" brings economic benefits and makes military conflicts among European states untenable. Externally, crisis management and conflict prevention have been central to the EU foreign policy agenda, as has support for international trade. The protection of Europeans, as indicated in Article 3.5 of the Common Provisions of the Treaty on European Union, can refer to both well-being and physical security, and both aspects have been elevated in recent years.

The EUGS suggests a range of measures "to guarantee our security, promote our prosperity and safeguard our democracies". The narratives of protecting Europe and protecting Europeans have been further strengthened through the Juncker Commission's (2014–2019) work on the Security Union under the narrative of "a Europe that Protects",⁴⁷ and subsequently through the work of Commission President Ursula von der Leyen (since 2019) on "Promoting our European way of life: Protecting our citizens and our values".⁴⁸ For example, the 2020–2025 EU Security Union Strategy suggests that stringent scientific evaluations and testing methods by the

⁴² European Commission (2021). Trade Policy Review: An Open, Sustainable and Assertive Trade Policy, COM(2021) 66 final, Brussels, 18 February. <https://trade.ec.europa.eu/doclib/docs/2021/february/tradoc_159438.pdf>.

⁴³ Council of the European Union (2021). Council Conclusions on the Global approach to Research and Innovation: Europe's strategy for international cooperation in a changing world, 28 September. Brussels.

⁴⁴ Council of the European Union. (2021). SFIC Opinion on the European Commission Communication, Global approach to research and innovation: Europe's strategy for international cooperation in a changing world, 23 September 2021, Brussels.

⁴⁵ Council of the European Union (2021). Council Conclusions on the Global approach to Research and Innovation: Europe's strategy for international cooperation in a changing world, 28 September 2021, Brussels.

⁴⁶ Like modern efforts at stability building, these science diplomacy efforts come with risks and unintended consequences, such as the differing domestic uses and instrumentalisation of archaeology for national identity discourses.

⁴⁷ European Commission (2019). "A Europe that protects: Continued efforts needed on security priorities", Press release, 24 July, <https://ec.europa.eu/commission/presscorner/detail/en/IP_19_4413>.

⁴⁸ European Commission, "Promoting our European way of life",



Commission's Joint Research Centre could assist with law enforcement, and that hybrid threats should from now on also be countered by way of education, technology and research. It also emphasises the role of security research and innovation in European security.⁴⁹

A broad range of science diplomacy activities could be employed with the aim of securing Europeans, even when this aim is seen through a foreign policy lens. One would be to protect Europeans from malign influence attempts by third states using scientific cooperation as a cover. Work is underway to establish guidelines on international scientific cooperation with authoritarian regimes, as well as on protection against the undesirable transfer of knowledge in cooperation and business ventures. EU cyber defence projects/initiatives – such as the 5G Cybersecurity Toolbox to address 5G security risks, EMPACT, Digital Europe Programme 2021–2027 – is another current example of the EU drawing on internal scientific and technological expertise to improve policies aimed at improving security for Europeans.⁵⁰ The history of science diplomacy in this field also offers insights. The biometrics system for Schengen Area border control can be seen as a European and sub-state-level collaboration on the security of European citizens and residents through border management controls – a 35-year history of science and technology collaboration.⁵¹

<https://ec.europa.eu/info/strategy/priorities-2019-2024/promoting-our-european-way-life_en>.

⁴⁹ European Commission (2020). The EU Security Union Strategy, Brussels, 24 July, Com(2020) 605 final.

⁵⁰ Council of the European Union (2021). *Cybersecurity: how the EU tackles cyber threats*.

⁵¹ For a study of the role of member state diplomats in the application of biometric technologies in the context of securing the Schengen boundaries, see Kyrtis, A. A. (forthcoming).

European Union strategic autonomy

Finally, European foreign policy today has an endogenous, actor-oriented purpose: to increase the EU's autonomy as a strategic actor. The ambition for strategic autonomy has experienced a dramatic increase in salience in recent years. Beginning in the late 1990s as the EU's aim to achieve an autonomous capacity to undertake small-scale military interventions, the concept has since developed into an ambition to achieve full-blown strategic autonomy or, when applied outside the military domain, to achieve technological sovereignty in key sectors. It has even been suggested that the broadest concept of self-sufficiency, European sovereignty, should span a wide array of societal fields.⁵² While the implications of these ambitions for autonomy differ, they are rooted in a belief that Europe should be less dependent on others, and more able to decide on and implement its own policy. This captures the traditional prerequisites of autonomy: an actor vested with a combination of freedom of action and capacity to act. The link between strategic autonomy – either political or technological – and science is clear. Fredrik Erixon of the European Centre for International Political Economy notes: "If Europe wants to maintain its autonomous capacity to understand, access, use and develop new technologies and be at the frontier of innovation – which should be the core meaning of 'strategic autonomy'" – it will have to invest far more resources in

"Ambassadors as technological facilitators: How COREPER diplomats make possible the legal shaping of border security technologies", <https://www.insscide.eu/results/publications/>.

⁵² For a discussion, see Kundnani, H. (2020). "Europe's sovereignty conundrum", *Berlin Policy Journal*, 13 May, <<https://berlinpolicyjournal.com/europes-sovereignty-conundrum/>>.



creating world-class education and research institutions”.⁵³

The EU has already leveraged science diplomacy activities to achieve this goal. The funding of R&D in the defence field through the €8 billion European Defence Fund is explicitly motivated by ambitions for Europe to establish more autonomous capacities and thereby increase its leverage in world politics. New functions such as the planned Defence Innovation Hub are motivated by the same factors. Other industrial sectors have also received R&D boosts, such as the European semiconductor industry which it is hoped will make the EU less dependent on other actors and markets.⁵⁴ In addition, the more general €95.5 billion research and innovation programme, Horizon Europe (2021-2027), is linked to ambitions for autonomy, in part through the sort of research it supports but in part also by who is *not* allowed to participate at strategic

phases. Initial discussions excluded Israel, Switzerland and the UK from quantum and space research to enable EU member states to become more autonomous and competitive. Although this blanket ban was revised and individual negotiations and agreements were initiated, the results are yet to be announced by the Commission.⁵⁵ Past uses of science diplomacy with the aim of increasing European autonomy demonstrate its persuasive power as well as its risks. The French pushed hard for an autonomous European space shuttle – the Hermes programme – during the 1980s using arguments about the need for autonomous European capacities in the field and not becoming too dependent on US resources. The project received some support from other European countries but was eventually cancelled due to the high costs as well as the question of the scientific outputs that might result.⁵⁶

⁵³ Erixon, F. (2021) “Achtung Europa: How the quest for strategic autonomy could undermine Europe’s power and prosperity”, *FriVarld*, <<https://frivarld.se/wp-content/uploads/2021/12/Erixon-EU-Rapport.pdf>>.

⁵⁴ Zubascu, F. (2021). “Chips Act on the way to help EU boost semiconductor R&D and manufacturing”, *ScienceBusiness*, 16 September.

⁵⁵ Zubascu, F. (2021). “White smoke? EU deal over quantum, space research lets Horizon Europe proceed”, *ScienceBusiness*, 4 June; and Zubascu, F. (2021). “Member states call for Horizon Europe to go full steam ahead following deal on space and quantum research”, *ScienceBusiness*, 10 June.

⁵⁶ See the forthcoming research by Anne de Floris for the InsSciDE project, <<https://www.insscide.eu/results/publications/>>.



What to do? Strategic objectives and practitioner recommendations

The above section analysed the relevance of science diplomacy to key European foreign policy interests, gave examples of what is already happening and reflected on the insights from science diplomacy history. Against this backdrop, what can or should the EU and its member states do to further its science diplomacy agenda⁵⁷ and enhance its contribution to European foreign policy? Existing research suggests that the EU, as a diverse but collective actor, requires three basic characteristics to strengthen itself as a strategic actor: coherence, or the ability of EU member states and institutions to work in tandem; capacities, or the material and institutional resources that enable action; and context, a permissive setting for EU policymaking.⁵⁸ This section makes suggestions on what the EU could do in relation to these basic strategic needs in order to increase the contribution of science diplomacy to the foreign policy interests discussed above. Six strategic objectives are suggested below, along with related recommendations.

1. Strengthen a free and vibrant European scientific community

- The primary objective for the EU in strengthening its science diplomacy is to safeguard a free, vibrant and outstanding scientific community that can generate excellence in scientific results as well as support EU foreign policy through science diplomacy. The Commission's 2022 Strategy for Universities states clearly that these actors "play a vital role in generating the evidence that underpins Europe's foreign and security policies, international agreements, and multilateral action".⁵⁹ A strong scientific base ensures the EU access to expertise and valuable support for all the above foreign policy goals. Investment in basic research needs to increase both at the EU level and in member states.
- Academic and scientific freedom – fundamental aspects of the functioning of the EU as well as its nascent science diplomacy – are under threat. This threat comes from efforts to root out theories and perspectives that are deemed inappropriate and from the general deterioration in liberal democratic principles in some member states. The principles of the 2020 Bonn Declaration on Freedom of Scientific Research, signed by all the EU member states, needs practical backing. European research support structures such as the EU Horizon programme must be accompanied by and linked to active measures against member state suppression of free and independent research.

⁵⁷ See point 34 of the European Council conclusions on a "Global approach to Research and Innovation: Europe's strategy for international cooperation in a changing world", 3813th meeting, 28 September 2021.

⁵⁸ On the development of the framework see Fägersten, B. (2020). "European autonomy in a changing world order". In: Bakardjieva Engelbrekt A., Bremberg N., Michalski A. and Oxelheim L. (eds), *The European Union in a Changing World Order*. Cham: Palgrave Macmillan).

⁵⁹ European Commission (2022). Communication from the Commission on a European Strategy for Universities, Brussels, 18 January.



2. Agree principles on scientific cooperation in an era of regime divergence and competition

- The geo-economic era of regime competition and rivalry in innovation and research puts the EU in a different place compared to the familiar post-Cold War position. While globalisation might not have delivered change in closed and authoritarian systems, attempts at full decoupling between democratic and authoritarian regimes would be a fruitless endeavour. In addition, full decoupling would deprive Europe of scientific progress and opportunities to influence and assemble knowledge about foreign entities. Hence, European actors must establish a middle ground between naivete (remaining open to any sort of cooperation) and decoupling, in particular for scientific cooperation with non-democratic systems.
- General principles must be further developed for academic interaction with non-democratic regimes, for example with explicit red lines on issues such as censorship and discrimination. Grey area situations will also need further elaboration and collegial discussion. Voluntary principles on funding, for example, would facilitate scientific cooperation on several of the above foreign policy goals. In particular, it would facilitate cooperation on global challenges where no state or bloc of states can manage the task alone.
- When working with partners in non-democracies, European researchers encounter challenges such as infringement of academic freedom and attempts at political influence. EU research funding instruments should increasingly finance support structures for researchers collaborating with counterparts in non-democratic countries, such as training sessions on risk management, assistance with the translation of key documents and facilitation of sharing of best practice among research and higher education institutes.⁶⁰ Further measures that research and education institutions can take, for example, on cybersecurity and partnership policies are suggested in a 2022 Commission document on tackling foreign interference.⁶¹
- Considering that much relevant research and research collaboration today takes place in research technology organizations (for example in the much hyped semiconductor field⁶²), science parks and private-public innovation partnerships, the EU should inspire corresponding discussions and principles in this fields and not only in traditional academic environments.

⁶⁰ See Tardell, M. (2021). "Swedish experiences of research collaboration with China: Challenges and the way forward", Swedish National China Centre.

⁶¹ European Commission (2022). Directorate-General for Research and Innovation, "Tackling R&I foreign interference", staff working document.

⁶² Rühlig, T. and Kleinhans, J-P. (2022). "Should the EU be concerned about high-tech research collaboration with China? Lessons from the case of semiconductors". CHERN, available at <<https://china-in-europe.net/should-the-eu-be-concerned-about-high-tech-research-collaboration-with-china-lessons-from-the-case-of-semiconductors-by-tim-ruhlig-chern-stsm-host-jan-peter-kleinhans-chern-stsm-grantee/>>.



3. Foster capabilities and culture of scientific advice in foreign policymaking

- The diplomatic arm of the EU machinery – the European External Action Service (EEAS) – would benefit from a more inclusive culture of knowledge infusion. One positive recent development is the fact that the EEAS has employed a dedicated science and technology adviser since 2020. Further progress could be made by way of training modules, staff mobility schemes with academic sabbaticals for relevant staff members, a policy planning process with more openings for scientific expertise and a bureaucratic process that has the time and resources to absorb the knowledge provided by experts. The work of the European Academies Science Advice Council (EASAC) could serve as an inspiration and resource.
- The EU delegations around the world should be able to benefit from staff with the competences to build and facilitate research and innovation networks, and coordinate member state efforts where possible.⁶³
- In an era of geo-economic rivalry where Europe's corporate sector is key to its foreign policy objectives, the EU should also work to spread scientific advice and knowledge beyond the governmental sector. Digital Innovation Hubs – “one-stop shops” to help organisations and companies, including small and medium-sized enterprises, take advantage and make use of new digital transformations (Artificial Intelligence, AI, digital skills and cybersecurity) by providing boot camps, traineeships, exchanges of curricula and training materials – have been one suggestion to help corporations adopt up-to-date transformative technologies and become more competitive.⁶⁴

4. Increase cohesion of EU level efforts

- Cohesion among the various EU bodies and institutions will be a key factor in increasing foreign policy clout. This is also essential for the successful exercise of science diplomacy. One example of inadequate levels of cohesion can be found in the European Commission's new research and innovation programme, Horizon Europe. The programme uses a mission strategy to steer efforts in relation to specific goals. While some of these goals are linked to the UN Sustainable Development Goals, the links between the missions and the EU's overarching foreign policy goals are tenuous.
- For a self-styled “geopolitical Commission” aiming to learn the language of power, it is striking that international research activities are discussed in isolation from today's major political questions and rivalries. While more geopolitical considerations are included in the Global Approach to Research and Innovation strategy, further policy cohesion must mean that the parts of the Commission that deal with areas other than foreign policy address the EU's overarching

⁶³ For a discussion, see the forthcoming research by Pierre-Bruno Ruffini, “Relations between national science diplomacies and European science diplomacy”, <https://www.insscide.eu/about/case-study-pitches/article/science-diplomats-pitches>, and <https://www.insscide.eu/results/publications/>.

⁶⁴ Cagnin, C., Muench, S., Scapolo, F., Störmer, E. and Vesnic-Alujevic, L. (2021). *Shaping and Securing the EU's Open Strategic Autonomy by 2040 and Beyond* (Publications Office of the European Union: Luxembourg).



international interests. In addition, general foreign and security policy strategies will also need to address the field of science diplomacy.

- One way to ensure such coherence could be the formulation of a joint agenda on Science Diplomacy by Mariya Gabriel, the Commissioner for Innovation, Research, Culture, Education and Youth, and Josep Borrell Fontelles, the Commissioner leading the work on “A Stronger Europe in the World”.
- Another measure would be to designate SD focal points within relevant EEAS departments and Commission directorates. Together with the SD staff in the EU’s external delegations, this group would form the internal stakeholders for European SD and elevate its role in everyday EU policymaking.
- On financing, more initiatives could be envisaged like the “Team Europe Initiative” with greater involvement from the European Investment Bank and the European Bank for Reconstruction and Development—expanding alliances on key priorities such as healthcare, infrastructure and critical technologies.

5. Increase cohesion of EU and member state efforts

- Cohesion among its disparate member states is often highlighted as a lever for the EU for managing its international relations. EU-level science diplomacy will be strengthened if it is supported rather than undercut by individual member state strategies. This requires that member states develop congruent national strategies that, at a minimum, do not conflict with common European efforts. For example, many national strategies are focused on securing national innovation goals and establishing bilateral research cooperation with third actors. Minimal coordination would ensure that these national efforts do not undermine common policies on innovation or weaken the EU’s hand in relation to third parties.
- The EU should consider establishing a Science Diplomacy Coordinator, modelled on the Counter Terrorism Coordinator, that could monitor member states’ activities and act as a focal point for cooperation. The coordinator should seek a stronger role for EU delegations, in cooperation with the holder of the EU presidency, to take a more central role in coordinating European science diplomacy efforts in third countries. The process for coordinating National Risk Assessments, where EU member states submit risk assessments according to a common template, could also be a guide here.
- On financing, coordinating efforts across member states could reduce disparities and fragmentation within the bloc, allowing for more cohesive development in the digital arena. In the current digital transformation, combining initiatives and pooling resources could not only reduce duplication but also lead to more efficient technical advances, notably in the cyber, quantum or AI spheres. For instance, a “quantum-web” is a genuine possibility involving coordinated efforts between EU research programmes, member states and the private sector to develop a connected network of quantum computers, simulators and sensors. Good



examples are the NIS Directive and the cyber diplomacy toolbox, which provides interoperability and a common framework for member states.

6. Leverage potential science diplomacy stakeholders

- This report has focused on the science diplomacy of the EU institutions, and to some extent its member states. This was motivated by the definition of science diplomacy as a conscious and even instrumental activity. It should be noted that other forms of interaction and cross-fertilisation between the scientific and diplomatic world can also affect science diplomacy, especially from a long-term perspective.
- The EU should therefore aim to build bridges and platforms of interaction with surrounding actors that can function as facilitators and, with time, leverage more official science diplomacy efforts. This could engage cities, NGOs, the academic world and the private sector, all of which possess power potential in this field. The new “EU Science Diplomacy Alliance” could act as a bridge or partner in this regard.⁶⁵
- However, these surrounding stakeholders – and scholars in particular – would also need to consider their role and agenda in the science diplomacy field. As argued above, science diplomacy serves an end that is usually tied to wider foreign policy goals. The extent to which scientists and experts will want to engage in and facilitate this form of statecraft, and how this could be done while respecting their integrity, merits thorough discussion in Europe’s academic environments.

⁶⁵ See <https://www.science-diplomacy.eu/about/eu-science-diplomacy-alliance/>.



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