USING SCIENCE DIPLOMACY
FOR ADDRESSING GLOBAL CHALLENGES

S4D4C Training Material for Workshops on Science Diplomacy

What is science diplomacy? An Introduction

Background	This training material is an output of the project S4D4C – Using science for/in diplomacy for addressing global challenges (www.s4d4c.eu). S4D4C has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770342. The project S4D4C selected and developed training materials (presentations, methods, exercises, games, etc.) for trainings on Science Diplomacy for different target groups (mainly diplomats, scientists and science diplomats). These materials are open source under creative commons licences (see below for the applicable license).
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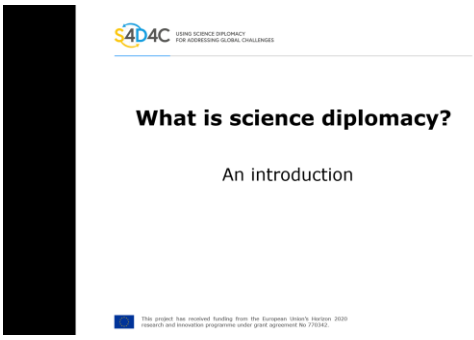
Details on the attribution	Basically, you are free to share and adapt for any purpose with attribution. Creator: S4D4C (Horizon 2020 project 770342). *Lorenzo Melchor, PhD* *Fundación Española para la Ciencia y la Tecnología (FECYT)* www.s4d4c.eu www.fecyt.es We are happy if you drop us a line when re-using the materials to learn about their dissemination: contact@s4d4c.eu.
Short description	This is a short presentation to establish some basic concepts and introduce the whole workshop structure.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770342.

Learning objectives	With this presentation, we aim to provide general introduction for all participants about Science Diplomacy and key concepts that will be covered throughout the sessions of the workshop. **Powerpoint presentation:** The session presenter will give a ppt presentation providing information about different aspects of Science Diplomacy (what is it, who are the stakeholders, what kind of local, national and regional strategies are in place, the role of the European Union, etc.). **Brainstorming or quiz:** The session should give the opportunity to have a debate around the introduced topics, to exchange ideas and experiences in the field science diplomacy.
Material type	☒ presentation ☐ method ☐ simulation game ☐ exercise ☐ other: _____.
Overall content category (if adequate and applicable)	☒ What is Science Diplomacy? ☒ Who are the Science Diplomacy stakeholders? ☒ How does the European Union practice Science Diplomacy? ☒ Which thematic and regional approaches of Science Diplomacy do exist? ☒ What set of skills do I need to be a good science diplomat? ☒ Which are good examples where Science Diplomacy has proven to be successful?
Target groups (1)	☐ Mainly for scientists ☐ Mainly for diplomats ☒ For any of the groups
Target groups (2)	☒ Mainly for beginners in Science Diplomacy ☒ Mainly for trainees with basic understanding of Science Diplomacy ☐ Mainly for advanced science diplomats ☐ For any of the groups
Group size	☐ For individual learners ☐ For small groups (up to 20) ☐ For large groups (between 20 and 100) ☒ For any group size
Duration	Powerpoint presentation (15-25 min) Brainstorming or quiz (10-15 min)
Level of interactivity	☐ high ☐ medium ☒ low
Preparation and material needed	• Powerpoint presentation • Screen • Computer
Recommended use case and guidance for the trainer	**Powerpoint presentation:** This presentation is an introductory talk to the whole workshop, so it will be useful to dive into the different general aspects of science diplomacy.

	Brainstorming or quiz: We would also recommend combining the presentation with some interactive elements: • You could use an introductory quiz to get first impressions who are the participants of your workshop or training (see https://www.s4d4c.eu/training_material/quiz/). Please make sure that your questions are clear and well structured. You could ask e.g. - Profession: What are you? (e.g. diplomat, science advisor, scientists, grant manager, representative of governmental organisation or industry) - Country of origin: Where are you from? (in English only) - Motivation: Why are you attending this workshop, webinar, conference? • You could prepare a group brainstorming. As a starting point, the participants could discuss questions like: - What does science diplomacy mean for you? - Who is a science diplomat? - What skills are needed in science diplomacy? During the session the presenter should refer to some of the participants' comments provided during the group brainstorming. • If you decide to combine both elements (introductory quiz and brainstorming), please notice that you will need more time than the estimated 10-15 min for the interactive part.
Further resources and links	*See Guided Note below*
Evaluation and assessment	*Not applicable*

GUIDANCE NOTE Presentation



Purpose of the slides: introduction

Content of the slides:

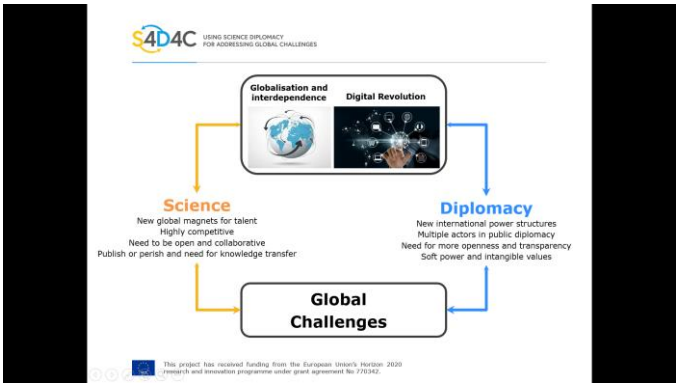
Before entering into the discussion of what science diplomacy is, its different conceptual approaches, its wide range of practices and stakeholders, it might be worth dealing first with a quick glance at the state of the world today and the challenges that both science and diplomacy are coping with. This will set the scene to focus on the interactive space that science diplomacy actually represents.

Science and technology will produce solutions to global challenges such as climate change, energy sustainability, infectious disease, food security, etc. These challenges will not only require international scientific collaboration, global policy implementation will also be mandatory if they are to be addressed and solved. (see also next slide)

Further information:

- Kehoane, Robert O. and Nye, Joseph S. (2000): Globalization: What's New? What's Not? And So What? In: Foreign Policy, Spring, pp. 104-119.

- Royal Society, The (2011): Knowledge, Networks and Nations: Global scientific collaboration in the 21st century. Royal Society Policy Document 03/11. London: The Royal Society. March. ISBN: 978-0-85403-890-9: https://royalsociety.org/-/media/Royal_Society_Content/policy/publications/2011/4294976134.pdf



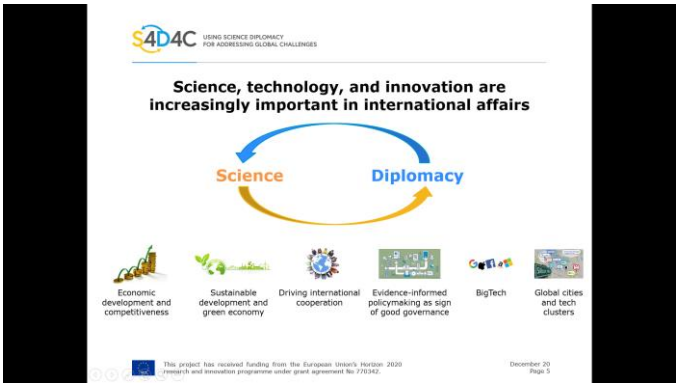
Purpose of the slide: role of globalisation and digital revolution

Content of the slide:

The increasing globalisation has had an impact on science, technology and innovation, as it has improved the exchange of knowledge, resources and talent worldwide, but certain challenges remain. Similar to what occurs in the diplomatic perspective, the rise of new scientific powers (China, India, Brazil, etc.) and the emergence of scientific nations in the Middle East, South-East Asia and North Africa, both help explain the shift to an increasingly multipolar scientific world, where Western nations no longer retain control or are leaders in the field.

The world today is more complex, interdependent and interconnected than ever before. Both globalisation and digitalisation are transforming our societies to a large extent: trade, financial markets, international relationships, knowledge and cultural exchanges, communications, social media and transportations.

These current developments, globalisation and digitalisation, affect science as well as diplomacy.



Purpose of the slide: Science, technology, and innovation are increasingly important in international affairs.

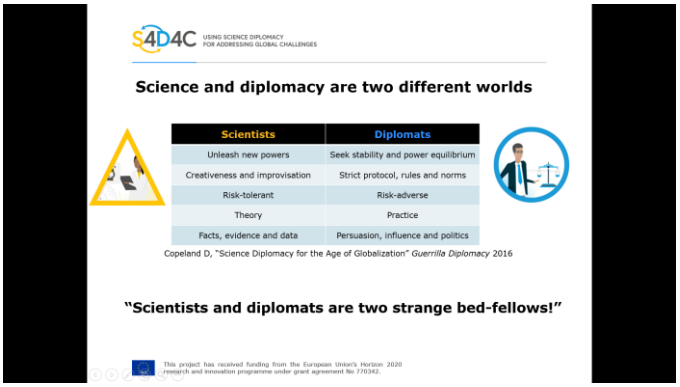
Content of the slide:

Science and diplomacy are strongly related to each other: they have reciprocal influence, especially in crucial fields of international cooperation. Economic development and competitiveness are drivers for international collaboration.

During the COVID-19 crisis many countries have swept to unilateral actions hoping of better competitiveness and economic development. But to overcome this crisis, it becomes clear that international collaboration, strong relationships and effective diplomacy are needed. Furthermore, the implementation of sustainable development and green economy is an overarching target that policymakers and scientists should jointly approach.

Based on scientific cooperation the dialogue with countries, where policy has failed (e.g. Russia or North Korea), can be kept alive.

The science can find solution for solving global challenges. Therefore, evidence-informed policymaking is a sign of good governance – it helps to build trust and transparency in the society. Also, in digitalisation (e.g. AI and smart cities) scientific collaboration could build bridges for a better future: joint efforts instead of pure competition.



Purpose of the slide: Science and diplomacy are two different worlds.

Content of the slide:

The worlds of science and diplomacy might seem opposite at first. As former Canadian diplomat Daryl Copeland describes in his book Guerrilla Diplomacy: Rethinking International Relations, while science is of universal value and applicability, its culture and methods are based in open discussions, challenging others, transparency, experimentation and risk-taking, diplomacy instead is about following protocol, maintaining stability, balancing power, negotiating and influencing others, all while operating in a highly hierarchical structure, often in secret.

Science and diplomacy also differ in their time scales for action and comfort with uncertainty. Publishing a research paper can take years, while in diplomacy often you have just a few hours to put together a briefing paper. In research, you rely on a lot of information being available and experimentation is central to your job. In diplomacy, you might not have the full picture of a given situation. Information is not always reliable, and experimentation isn't really an option.

But there are some important elements that science and diplomacy have in common, like an analytical approach and the importance of trust and relationships.

Further information:

- Copeland, Daryl (2009): Guerrilla Diplomacy: Rethinking International Relations. Boulder: Lynne Rienner Publisher. ISBN: 978-1-58826-679-8; https://www.diplomacy.edu/resources/books/reviews/guerrilla-diplomacy-rethinking-international-relations

- Mauduit JC, Gual Soler, M. (2020): Building a Science Diplomacy Curriculum. Frontiers in Education, 5:138; https://www.frontiersin.org/articles/10.3389/feduc.2020.00138/full

Purpose of the slide: definition (part 1)

Content of the slide:

There is not a singular concrete definition, what seems to be key in defining science diplomacy is the increasing role and relevance of science in world politics. In fact, science diplomacy is more than just international scientific collaborations. Science diplomacy implies the involvement of political actors and interests, whereas international science collaborations do not necessarily involve them at all and indeed they are sometimes commercially oriented and often without direct state participation.

The overall discussion and conclusions were summed up in a policy report entitled "New frontiers in science diplomacy" (The Royal Society and AAAS, 2010). The report explores the universal values of science, namely rationality, transparency and universality, which can all help underpin good governance and build trust between nations. It also covers the changing dynamics of the power balance in the international landscape focusing on the role of science as a soft-power tool that can help in building influence and partnerships worldwide.

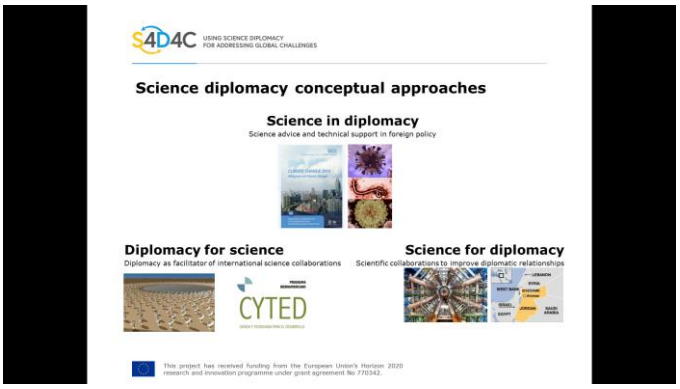
Science diplomacy seems to incorporate explicit attempts to interconnect the fields of science, politics, and economics. At least it illustrates a new rhetorical strategy that emphasizes novel policies of building bridges between the drivers of supposedly insular fields, thus of educating or at least sensitizing actors to seize an allegedly common understanding about problems and/or solutions. Its catch-cry, if there was one, would go: there is no more international affairs without S&T, and no S&T without

internationality. Based on that, Tim Flink & Nicolas Rüffin have defined science diplomacy as an umbrella term that attracts and glues together different understandings at the intersection of international relations and science policy or one that might emphasize some aspects vis-à-vis others.

Further information:

- Royal Society, The (2010): New frontiers in science diplomacy. RS Policy document 01/10. January 2010 RS1619. London: The Royal Society. ISBN: 978-0-85403-811-4: https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2010/4294969468.pdf

- Tim Flink & Nicolas Rüffin, The current state of the art of science diplomacy, 2019: https://www.academia.edu/38918284/The_Current_State_of_the_Art_of_Science_Diplomacy



Purpose of the slide: definition (part 2) and examples

Content of the slide:

Within the report "New frontiers in science diplomacy" the first taxonomy for science diplomacy, that has become widely used, has been established:

- Science in Diplomacy: informing foreign policy objectives with scientific advice, such as the role of scientists providing advice to climate change or global health

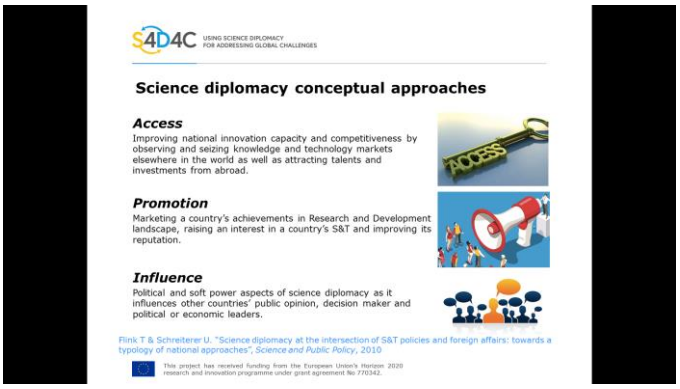
  Example: The Intergovernmental Panel on Climate Change (IPCC): https://www.ipcc.ch/

- Diplomacy for Science: facilitating international science cooperation

Example: Scientific Programme CYTED: http://www.cyted.org/en

- Science for Diplomacy: using science cooperation to improve international relations between countries

  Example: Synchrotron in Jordanian SESAME: https://www.sesame.org.jo/



Purpose of the slide: definition (part 3)

Content of the slide:

Apart from the already well-known RS/AAAS conceptualization, Flink & Schreiterer (2010) have proposed another substantive differentiation or typology to conceptualize science diplomacy. Deriving from an analysis of the concrete actions that state actors have shown, these authors distinguish between three strategic purposes to characterise different varieties of policies and strategies to promote international scientific cooperation and enact science diplomacy (see slide):

- Access
- Promotion
- Influence

Further information:

- Flink, Tim; and Schreiterer, Ulrich (2010): Science diplomacy at the intersection of S&T policies and foreign affairs: toward a typology of national approaches. In: Science and Public Policy, 37(9), November 2010, pages 665–677. DOI: 10.3152/030234210X12778118264530; https://www.academia.edu/4031307/Flink_T._Schreiterer_U._2010_Science_diplomacy_at_the_intersection_of_S_and_T_policies_and_

foreign affairs toward a typology of national approaches. In Science and Public Policy 37 9 pp. 665-677

Purpose of the slide: definition (part 4)

Content of the slide:

Four renowned chief scientific advisers to Foreign Ministries have postulated an alternative classification based on a pragmatic reframing. The authors argue that while the Royal Society and AAAS's approach has been useful for academic and theoretical discussions, the concept proves fairly imprecise in real-life scenarios: neither does it capture all relevant elements nor does it provide clear political responsibilities. In their experience, a focus on why a country might invest efforts and resources in science diplomacy and international science could be the basis for a more utilitarian framing of science diplomacy, and one that better resonates with government agencies.

Therefore, they suggest a more utilitarian science diplomacy framework based on three categories:

- Actions designed to directly advance a country's national needs. This group would comprise the exercise of soft power to increase the impact of a country worldwide, to become more strategic in identifying how science relationships can promote trade and advance broader diplomatic interests, or to assist in development with science information and building science partnerships between donor and recipient countries.

- Actions designed to address cross-border interests. These involve bilateral or cross-boundary issues, the use or access to shared resources (such as gas fields, fish stocks, etc.), and the exploitation

of shared technical services (pharmaceutical regulation, food safety assessment, etc.).

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

Further information:

- Gluckman, P.D.; Turekian, V.; Grimes, R.W.; and Kishi, T. (2017): Science Diplomacy: A Pragmatic Perspective from the Inside. In: Science Diplomacy, Vol. 6, No. 4 (December 2017): https://www.sciencediplomacy.org/article/2018/pragmatic-perspective

Purpose of the slide: Who are the stakeholders in science diplomacy?

Content of the slide:

We apply the following taxonomy of science diplomacy stakeholders according to the nature of their work:

- Governmental stakeholders: involving nation states and subnational governments in science diplomacy.

- International and supranational stakeholders: in other words, multilateral organisations that, through intergovernmentalism or supranationalism, deal with topics that transcend national boundaries and that are directly engaged in global governance such as global health, global trade, peace and culture, and so forth

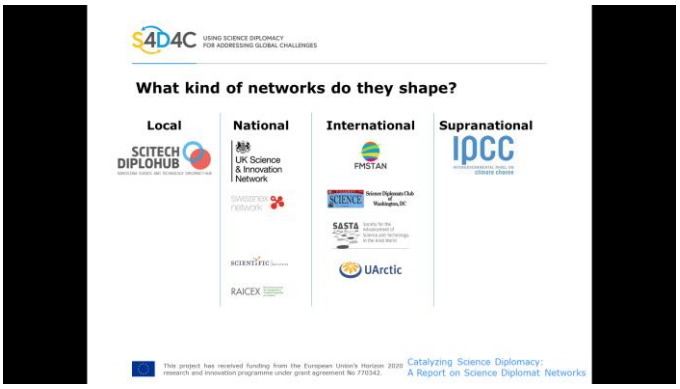
- Research and academic stakeholders: research and academic actors with a stake in science diplomacy cover from research councils to universities, research centres, national academies, learned societies, and also individual researchers.

- Industry sector stakeholders: private companies, which can be trans- or multinational companies as well as Small and Medium Enterprises (SMEs), can be also involved in science diplomacy.

- Civil society stakeholders: the role of national and transnational NGOs, civil society organisations, private charities, and even individuals can be noted in science diplomacy.

Further examples:

- Online Knowledge Resources – Database: https://www.s4d4c.eu/online-knowledge-resources/



Purpose of the slide: What kind of networks do they shape?

Content of the slide:

Depending on the major purpose of that network, we could group the stakeholders into four categories:

1. Local or subnational networks: when their focus is on the local or provintial level, such as any global city or province/state at the subnational level

2. National networks: when their focus pursues national interests

3. International networks: when the array of activities is focused on a specific world region

4. Supranational networks: involving stakeholders from all nationalities and tackling global challenges

Local or subnational networks: SciTech DiploHub, the Barcelona Science and Technology Diplomacy Hub, is a non-profit, independent, nonpartisan civil initiative led by an interdisciplinary, international team of scientists, engineers and foreign affairs and public policy professionals. SciTech DiploHub is committed to making Barcelona the first city in the world to implement a science and technology diplomacy strategy and to make Barcelona an influential global player in tackling humanity's grand challenges through science and technology.

Further information: http://www.scitechdiplohub.org/

National networks: The UK is a global leader in science and innovation, and international collaboration is essential to maintaining the excellence of the UK's research base and the competitive advantage of their innovative businesses. The Science and Innovation Network (SIN) allocates local officers in over 40 countries and territories around the world, in order to build partnerships and collaborations between the UK and other countries. SIN officers work with the local science and innovation community in support of UK policy overseas, leading to mutual benefits to the UK and the host country.

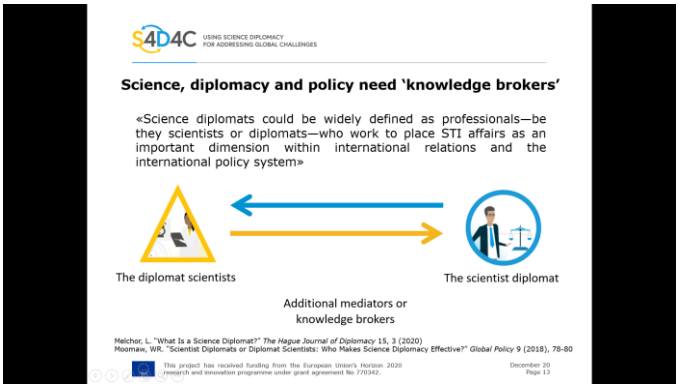
Further information: https://www.gov.uk/world/organisations/uk-science-and-innovationnetwork

International networks: The University of the Arctic (UArctic) is a cooperative network of universities, colleges, research institutes and other organizations concerned with education and research in and about the North. UArctic launched the Science Diplomacy Thematic Network in 2017 in order to train scientists as diplomats with theory, methods and skills that contribute to informed decision-making for sustainable development in the Arctic and elsewhere across generations.

Further information: https://www.uarctic.org/organization/thematic-networks/science-diploma

Supranational networks: The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The objective of the IPCC is to provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are also a key input into international climate change negotiations.

Further information: https://www.ipcc.ch/



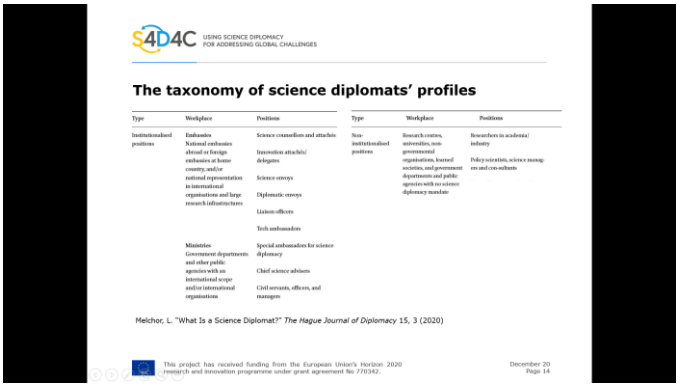
Purpose of the slide: "knowledge brokers"

Content of the slide:

Science, diplomacy and policy need "knowledge brokers" who advise to policy-makers and decision-makers in governmental institutions or intergovernmental transnational and supranational institutions on the one side (such as the United Nations) and to scientists and academia on the other side. Working in the interface between science and policy is a challenge that requires sharing best practices as to how to best present the scientific evidence or to address questions from policy-makers and decision-makers. Career scientists and career diplomats may develop or acquire full- or part-time responsibilities to liaise in science diplomacy, becoming "knowledge brokers"; for instance, scientists may become chief scientific advises to their Ministry of Foreign Affairs or scientific counsellors at an embassy (the diplomat scientists), while diplomats may become Tech ambassador or national representatives to a large-research infrastructure (the scientist diplomat). On top of that, we may have additional mediators or knowledge brokers such as science managers and/or policy officers who are no longer career scientists or diplomats but have a scientific or diplomacy background and are focused on fostering more opportunities for scientists and diplomats to interact. In general, all these "knowledge brokers" are not necessarily experts on all scientific matters, but they understand the logics of science, are very well networked with scientists and academic institutions and thus know where to find the most appropriate expert on any given topic. They have the skills to explain evidence required for informed decision making about foreign affairs, serving as evidence brokers.

Further information:

- Moomaw, WR. "Scientist Diplomats or Diplomat Scientists: Who Makes Science Diplomacy Effective?" Global Policy 9 (2018), 78-80; https://ideas.repec.org/a/bla/glopol/v9y2018is3p78-80.html



S4D4C USING SCIENCE DIPLOMACY FOR ADDRESSING GLOBAL CHALLENGES

The taxonomy of science diplomats' profiles

Type	Workplace	Positions
Institutionalised positions	Embassies National embassies abroad or foreign embassies at home country, and/or national representation in international organisations and large research infrastructures	Science counsellors and attachés Innovation attachés/ delegates Science envoys Diplomatic envoys Liaison officers Tech ambassadors
	Ministries Government departments and other public agencies with an international scope and/or international organisations	Special ambassadors for science diplomacy Chief science advisers Civil servants, officers, and managers

Type	Workplace	Positions
Non-institutionalised positions	Research centres, universities, non-governmental organisations, learned societies, and government departments and public agencies with no science diplomacy mandate	Researchers in academia/ industry Policy scientists, science managers and con-sultants

Melchor, L. "What Is a Science Diplomat?" *The Hague Journal of Diplomacy* 15, 3 (2020)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770342.

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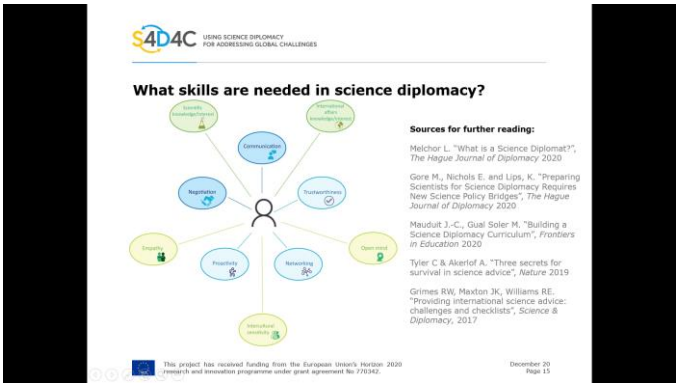
Purpose of the slide: taxonomy

Content of the slide:

Science diplomats could be widely defined as professionals — be they scientists or diplomats — who work to place STI affairs as an important dimension within international relations and the international policy system. This slide shows a typology of "institutionalised" and "non-institutionalised" positions. Whereas science diplomacy institutionalised roles mostly involve official states' representatives usually acting through formal diplomatic engagement (left side), non-institutionalised roles usually refer to non-state actors operating through non-governmental, unofficial and informal channels who only occasionally engage with government officials (right side).

Further information:

- Melchor, L. "What Is a Science Diplomat?" The Hague Journal of Diplomacy 15, 3 (2020); https://www.s4d4c.eu/elucidating-what-a-science-diplomat-is/



Purpose of the slide: What skills are needed in science diplomacy?

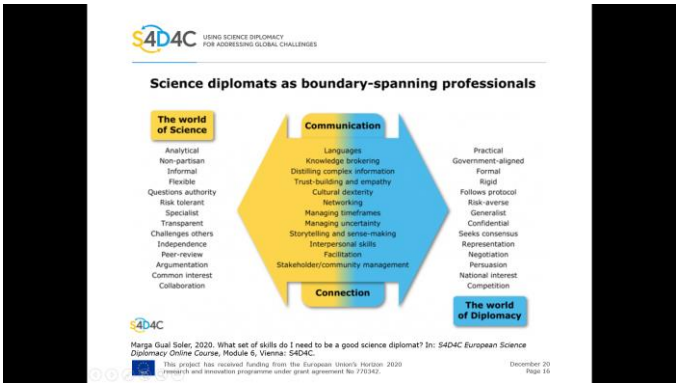
Content of the slide:

In mid-October 2018, the S4D4C project launched its 'Open Doors Programme' in order to train highly motivated scientists in science diplomacy. This competitive scheme gave five grantees the opportunity to engage with different diplomacy stakeholders across Europe and gain hands-on experience.

During the training, Open Doors grantees identified ten skills that they felt a science diplomat should have, regardless of his/her scientific or diplomatic background.

Further information:

- Open Doors: https://www.s4d4c.eu/open-doors-programme/
- Gluckman P., Policy: The art of science advice to government. Comment in Nature. 2014, Apr 3;508(7494):44. PMID: 24627919: https://pubmed.ncbi.nlm.nih.gov/24627919/
- Grimes RW, Maxton JK, Williams RE. "Providing international science advice: challenges and checklists", Science & Diplomacy, 2017: https://www.sciencediplomacy.org/article/2017/science-advice
- Tyler C & Akerlof A. "Three secrets for survival in science advice", Nature 2019: https://pubmed.ncbi.nlm.nih.gov/30755752/



Purpose of the slide: boundary-spanning professionals

Content of the slide:

This slide includes 'boundary skills' for effective communication and connection between the two "worlds" (see the middle of the graph) as well as skills that are typically developed as part of a career in science (left site) or in diplomacy (right site) that professionals coming from the other side should learn about.

Further information:

- Marga Gual Soler, 2020. What set of skills do I need to be a good science diplomat? In: S4D4C European Science Diplomacy Online Course, Module 6, Vienna: S4D4C; https://www.s4d4c.eu/lessons/6-4-intercultural-competence-intercultural-sensitivity-and-intercultural-communication/

Annex – Details on the License

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