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From:	General Secretariat of the Council
To:	Delegations
Subject:	European Research and Innovation Area Committee (ERAC) – plenary session, 15-16 April 2026, Nicosia Science diplomacy- discussion paper and contribution by Professor Costas N. Papanicolas

European Research and Innovation Area Committee (ERAC) delegations will find in annex a background note, as well as a paper by Professor Costas N. Papanicolas, entitled “Regional Science Diplomacy in an Era of Geopolitical Realignment and Strategic Competition: The Eastern Mediterranean-Middle East Region as a Case Study”, in view of the strategic debate at the ERAC plenary meeting on 15-16 April 2026 in Cyprus.

Science Diplomacy

Strategic debate

Background note

ERAC is invited to hold a strategic debate on Science Diplomacy. The session will open with a presentation on the “open and secure” package which includes the proposal for a Council recommendation on a European Union framework for science diplomacy, currently under discussion by the Council Working Party on Research. The initiative responds to a rapidly evolving geopolitical landscape, in which research and innovation are increasingly linked to competitiveness, economic and research security and geopolitical influence. At the same time, there is a growing need to strike an appropriate balance between openness and security in international cooperation, while addressing the current fragmentation of Member States’ approaches through enhanced coordination and cooperation between the Commission and the Member States on science diplomacy.

In this context, the proposed framework aims to strengthen the European Union’s global leadership in science diplomacy, safeguard and promote its values, including academic freedom, international cooperation, its strategic interests, technological and data sovereignty, and to enhance coherence between Union’s and Member States’ actions. It also encourages the development of voluntary national science diplomacy strategies, adequate support structures for the coordination of science diplomacy across government and with key stakeholders, and the more strategic use of EU assets, such as research and technology infrastructures.

Against this background, the contribution by Prof. Costas N. Papanicolas provides a regional perspective on the evolving strategic role of science diplomacy in addressing transboundary challenges and geopolitical complexity. It emphasises the importance of science-anchored cooperation as a platform for dialogue, risk assessment and coordinated action in regions characterised by shared challenges, such as climate change, energy systems and water management. In particular, it highlights the added value of regional science diplomacy as a complementary approach to global frameworks, enabling cooperation even in politically complex environments while leveraging European scientific capabilities as instruments of external actions.

The Eastern Mediterranean is presented as a relevant case, where initiatives such as the Eastern Mediterranean and Middle East Climate Change Initiative (EMME-CCI) illustrate how science-based cooperation can contribute to dialogue, trust-building and regional stability.

With the keynote in mind, the discussion should therefore explore Member States' views on Science Diplomacy and how it can effectively bridge strategic objectives with operational realities on the ground. In particular, delegations are invited and encouraged to reflect on the following questions:

1. How should the EU position science diplomacy to effectively balance openness, competitiveness and security in the current geopolitical context?
2. Which concrete instruments should be prioritised to ensure effective implementation?
3. The example on which Prof. C.N. Papanicolas focuses shows that shared environmental and climate risks can create political incentives for cooperation even among states with strained relations. Can Member States share examples where scientific collaboration has led to tangible policy outcomes or sustained partnerships in complex or politically sensitive contexts? What key success factors can be identified?

Regional Science Diplomacy in an Era of Geopolitical Realignment and Strategic Competition: The Eastern Mediterranean-Middle East Region as a Case Study

Costas N. Papanicolas

Executive Summary

The relationship between science, technology and geopolitical power has undergone a transformation that is not incremental but structural. Research infrastructures such as data systems and artificial intelligence platforms are no longer merely means of advancing strategic interests — they have become the terrain of competition itself. In this context, science diplomacy has itself been transformed: from a means of sustaining dialogue across political divides to a primary instrument for managing shared systemic risks and for building cooperative frameworks, even in cases where conventional diplomacy cannot. Europe faces a distinctive challenge in this landscape: how to remain open and principled while protecting its long-term interests against pressures that now permeate the global scientific system itself. It is argued that regional science diplomacy — structured, scienceanchored cooperation focused on transboundary challenges in specific neighbouring regions — represents a strategic instrument that Europe has not yet fully developed. In a world of increasing conflicts and fractured multilateralism, such capacity is not peripheral. It is indispensable.

The Eastern Mediterranean and Middle East Climate Change Initiative (EMME-CCI) illustrates this argument in practice. The region combines acute climate vulnerability, significant energy resources and a political landscape that includes active conflicts and severed diplomatic relations among several of its states. Against this background, the EMME-CCI established a science-anchored regional cooperative framework culminating in a summit co-chaired by Egypt and Cyprus at COP-27. Access to European scientific infrastructures — high-performance computing, Earth observation, integrated regional modelling — proved decisive in building the analytical credibility upon which trust and cooperation could rest. Cyprus' convening role reflects not its size but its unique position as the only EU member state located in the Middle East — a unique geographic and institutional gateway between the European Research Area and the region.

Lessons drawn from the EMME-CCI should be viewed with care. The initiative is not a success story — it is an unfinished one, slowed, but not stopped, by a multitude of factors. That it has reached this point, and done so with recently re-invigorated momentum, is itself the finding.

Conclusions with possible relevance for the ERA and its external dimension are: a) the need for a more deliberate strategic framework for regional engagement; b) the deployment of Europe's shared scientific infrastructures as instruments of external cooperation; c) recognition that geopolitical positioning — not scale — determines which member states can exercise a leading convening role; d) governance architecture designed specifically for each setting's fractures and asymmetries rather than applied from a template; and e) the systematic embedding of science diplomacy in ERA partnership agreements and external funding instruments. Together they point toward an ERA external dimension capable of operating as a substantive instrument of European engagement — grounded in scientific credibility, and effective where other forms of cooperation cannot reach.

1. Introduction: Science Diplomacy in a Structural Geopolitical Transition

Science diplomacy has long been understood primarily as a facilitative instrument — a means of sustaining dialogue, maintaining scientific exchange, and preserving channels of cooperation even in periods of political tension. Examples from the Cold War era are abundant, where scientific collaboration often provided rare avenues of interaction across geopolitical divides. Even today, initiatives such as the SESAME synchrotron project in the Middle East demonstrate the enduring value of science cooperation as a bridge among countries whose political relations may otherwise be limited. In this sense, science diplomacy has long served as a confidence-building mechanism capable of maintaining communication and collaboration where traditional diplomatic channels may be constrained.

The geopolitical environment in which science diplomacy operates, however, has undergone a transformation that is not incremental but structural. The strategic importance of technological capabilities in shaping global power is not new — industrial rivalries of the early twentieth century, the geopolitics of oil, and the technological competition of the Cold War all illustrate this dynamic. What distinguishes the present period is not merely the scale of technological competition but its character. Previous geopolitical rivalries centred on access to and exploitation of physical resources — territory, raw materials, energy. Today, knowledge itself, and the systems that generate and control it — data infrastructures, satellite networks, artificial intelligence platforms, high-performance computing — have risen to an equal strategic significance.

Today's international environment is marked by intensifying strategic competition, particularly between the United States and China, increasingly unfolding through semiconductor supply chains, digital infrastructures, quantum capabilities, space systems and standards-setting processes — domains that shape not only economic competitiveness but regulatory influence and long-term geopolitical positioning. Science, technology and innovation ecosystems have themselves become central arenas of geopolitical rivalry, not merely domains affected by competition but one of its principal drivers. It follows that science diplomacy has itself undergone a transformational change, acquiring a strategic significance it did not previously possess.

In this context, Europe must take proactive measures to ensure that international scientific cooperation remains both open and secure, while simultaneously safeguarding academic freedom and protecting critical technologies, knowledge and research infrastructures. At the same time, climate change operates as a systemic multiplier of instability — interacting with water scarcity, food systems, migration pressures and energy infrastructures. The global energy transition is therefore not merely a technological transformation but one deeply embedded in geopolitical calculation, intersecting with questions of strategic autonomy, critical raw materials and long-term economic resilience. Within this evolving context, science diplomacy increasingly arises from the recognition of compelling mutual interests in addressing challenges that are inherently transboundary — challenges whose scale and complexity make purely national approaches insufficient and scientific cooperation not merely desirable but a practical necessity.

The relationship between global and regional dimensions of science diplomacy is particularly relevant here. Over three decades, the international community has built a comprehensive governance architecture for climate change centred on the UNFCCC and the Paris Agreement — a framework oriented primarily toward mitigation. The most immediate operational challenges of climate change, however, unfold at regional scales: adaptation strategies, water systems, energy infrastructures and environmental vulnerabilities that cross national borders and require coordination among neighbouring countries. Regional science diplomacy emerges as a complementary layer to this global architecture — one that Europe, combining world-class scientific capabilities with a commitment to multilateral cooperation, is particularly well positioned to develop.

This paper examines regional science diplomacy within this broader structural transition, using the Eastern Mediterranean and Middle East as an illustrative case. The region represents a convergence zone of climate stress, hydrocarbon resources, renewable potential and complex political relations. The Eastern Mediterranean and Middle East Climate Change Initiative (EMME-CCI) provides an operational example of how science-anchored cooperation can function in politically sensitive environments, linking scientific assessment with emerging frameworks for coordinated action. The experience offers insights relevant to Europe's evolving strategic posture and to the external dimension of the European Research Area.

2. Europe's Position in the Era of the Securitisation of Knowledge and Technology

The European Union occupies a distinctive position in the emerging landscape of knowledge-based geopolitical competition. Unlike powers whose influence has historically relied on military capabilities or control of strategic resources, Europe's primary structural attribute is the size and depth of its integrated market, combined with a highly developed scientific and innovation ecosystem. The European Research Area has fostered cross-border collaboration among universities, research centres and national innovation systems, creating one of the most integrated scientific landscapes globally. Europe also hosts a dense network of advanced research infrastructures, high-performance computing capabilities and large-scale observational systems — among them Copernicus, whose Earth observation and modelling capabilities play a central role in the global understanding of environmental and climate processes.

These assets give Europe a capacity that goes beyond scientific excellence alone. In a world where scientific knowledge, modelling capability and data infrastructures increasingly underpin policy decisions in areas such as climate adaptation, energy transition and environmental management, access to advanced scientific capabilities becomes a strategic resource in its own right. Scientific capability itself becomes an instrument of strategic engagement — one anchored not only in technological capability but also in democratic governance, respect for international law and a policy tradition that places human welfare and societal resilience at the centre of technological development.

This positioning is particularly relevant in neighbouring regions where shared environmental systems, interconnected energy infrastructures and climate vulnerabilities create strong incentives for cooperative scientific engagement. Such cooperation reflects a genuine convergence of interests: Europe’s research infrastructures and scientific networks serve as platforms for collaborative knowledge production, while Europe itself has a direct stake in the stability and resilience of its neighbourhood. Environmental instability, energy disruptions or climate-induced stresses in adjacent regions carry inevitable implications for Europe’s own economic, environmental and security landscape. In this context, the emerging European framework for science diplomacy provides an important opportunity not only to strengthen coordination between Member States but to fully mobilise Europe’s research and innovation assets in support of the Union’s strategic interests, global partnerships and the collective effort to address shared global challenges.

3. The Regional Dimension of Science Diplomacy

Transboundary challenges — climate change, water systems, energy infrastructure, environmental degradation — share a common characteristic: they are poorly served by purely national scientific approaches and require regional cooperation to generate the knowledge base that effective policy demands. Regional science diplomacy emerges in this context as a structured response to objective necessity rather than diplomatic goodwill. Climate change provides a most fully developed illustration of this logic, and it is through this lens that the regional dimension of science diplomacy is examined here and in the rest of this treatise — while recognising that analogous dynamics operate across other domains of shared systemic risk.

The global climate governance architecture developed under the UNFCCC has been primarily oriented toward mitigation — the collective effort to reduce greenhouse gas emissions. Because greenhouse gases mix globally, mitigation is inherently a global public good requiring coordinated international commitments of the kind established through the Paris Agreement. Climate adaptation, however, presents a fundamentally different challenge. Its impacts are highly uneven geographically and manifest within specific regional environmental systems — water scarcity, heat stress, desertification, coastal vulnerability — that are strongly shaped by regional climatic conditions and socioeconomic structures. Adaptation is therefore inherently regional in character, requiring regionally resolved projections, shared environmental observations and integrated modelling of hydrological and energy systems that frequently cross national boundaries.

In this context, scientific capability becomes a central enabling factor. High-resolution regional climate modelling, shared observational networks and integrated data systems provide a common analytical framework through which neighbouring countries can assess risks and evaluate policy options — establishing a basis for cooperation even in politically complex environments. Regional science diplomacy thus emerges as a complementary layer to the global climate governance architecture: where global negotiations focus on mitigation commitments, regional scientific cooperation supports adaptation strategies, energy transition planning and coordinated responses to shared environmental pressures. For Europe, with its combination of advanced scientific infrastructure and commitment to multilateral engagement, developing this regional dimension represents both a strategic opportunity and a natural extension of the ERA’s external reach.

4. The Eastern Mediterranean and Middle East: Climate, Energy and Geopolitical Complexity

The Eastern Mediterranean and Middle East provides a particularly relevant setting in which to examine the role of regional science diplomacy. Several structural dynamics converge here: pronounced climate vulnerability, significant energy resources, emerging renewable potential, and geopolitical relations among neighbouring states that range from friendly and cooperative to openly hostile. Together, these factors create conditions in which shared scientific understanding becomes both necessary and potentially valuable. In this regard, initiatives emerging from the Eastern Mediterranean region, including those facilitated by Cyprus, illustrate how science-based cooperation can help foster dialogue and shared understanding across a complex geopolitical landscape.

From a climatic perspective, the EMME region is one of the global hotspots of climate change. Warming is occurring faster than the global average, accompanied by increasing frequency and intensity of heatwaves, declining precipitation and growing pressure on already scarce water resources — with significant implications for agriculture, urban environments and regional ecosystems. Because the relevant climatic and hydrological systems extend across national boundaries, understanding these developments requires regionally integrated scientific analysis that no single country can provide alone.

The region simultaneously occupies a critical position in the global energy landscape. Substantial hydrocarbon resources across the broader Middle East continue to shape global energy markets, while recent natural gas discoveries in the Eastern Mediterranean have added a further dimension to regional energy dynamics. At the same time, exceptional solar irradiation levels create conditions highly favourable for large-scale renewable energy deployment, placing the region at the intersection of existing hydrocarbon systems and future energy transition pathways. The transition from fossil fuels to renewables poses questions of equity and distribution — who bears the costs, who captures the benefits — that include inherently transboundary issues. Scientific cooperation provides an essential foundation for addressing them.

These climatic and energy dynamics unfold within a region of considerable political complexity and widely varying institutional capacity. Where traditional diplomatic cooperation faces limitations — and in parts of this region, where states are in active conflict or maintain no formal diplomatic relations — science-based engagement can provide a different kind of platform. By focusing on shared evidence and jointly produced knowledge, scientific cooperation can help establish common understanding of regional challenges even where political conditions would otherwise preclude structured dialogue.

5. The Eastern Mediterranean and Middle East Climate Change Initiative: Operationalising Regional Science Diplomacy

The EMME-CCI emerged as a concerted effort to develop a scientifically grounded understanding of regional climate dynamics and translate it into a framework capable of supporting coordinated action. Building on more than a decade of climate research centred at the Cyprus Institute and supported through European research programmes, the initiative represented a natural extension of evolving scientific cooperation toward a more structured regional platform. From the outset it was conceived not merely as a scientific assessment exercise but as a framework for concerted regional action grounded in shared scientific understanding — one that could function across the political complexity that characterises the region.

The scientific foundation was substantial. Approximately 240 scientists from countries across the Eastern Mediterranean and Middle East, together with colleagues from European institutions, contributed to the development of regional climate projections, systematic environmental data collection and coordinated observational activities.

Their work generated an integrated understanding of climate dynamics and their implications for water resources, energy systems, agriculture, urban environments and ecosystem stability — creating a common analytical reference point through which regional risks could be assessed in a consistent and comparable manner across borders and across political divides.

The central ambition of the initiative, however, was always to move beyond knowledge generation toward structured policy dialogue and cooperative action. This objective is embodied in the Regional Action Plan — the RAP — which represents the operational core of the initiative and the primary vehicle through which its scientific work acquires practical significance. The RAP identifies a broad portfolio of mitigation, adaptation and enabling measures relevant to the region. Critically, it does not prescribe a uniform pathway; rather, it provides a framework within which countries, sub-regional groupings or coalitions of the willing can pursue actions aligned with their respective priorities and capacities. The formulation, acceptance, funding and successful implementation of the RAP will ultimately determine whether the initiative fulfils its potential — it is the instrument through which science diplomacy translates into durable cooperative commitment.

The governance architecture designed to support this process deserves particular attention, as it illustrates principles of wider applicability. Three design choices proved especially important.

Scientific anchoring. The agenda is defined by shared evidence — coordinated observational networks, common data systems and jointly developed analytical tools — rather than by political negotiation. This keeps discussions focused on jointly recognised risks and reduces the leverage of political disagreement over the substance of cooperation.

Voluntary and flexible participation. The framework allows subsets of participating countries to advance specific initiatives where interests converge, without requiring consensus across the whole. This prevents cooperation from stalling due to political disagreement in unrelated areas and allows progress to be made where conditions permit, without waiting for comprehensive alignment.

Careful sequencing. Scientific collaboration and joint assessment provide the initial foundation upon which policy dialogue develops, which in turn enables the identification and implementation of concrete projects. Cooperation expands gradually — from knowledge sharing to practical collaboration — as trust accumulates and mutual benefit becomes demonstrable.

The political validation of this process came at COP-27, where a regional summit devoted to climate challenges in the Eastern Mediterranean and Middle East was convened and co-chaired by President Abdel Fattah el-Sisi of Egypt and President Nicos Anastasiades of Cyprus. The meeting brought together the leadership of ten countries from the region, with observers from the European Union, the United States, the United Kingdom, the Holy See and other international actors. That a collaboration rooted in scientific work had evolved into a platform of this political significance demonstrated, in concrete terms, the convening power that science-anchored regional dialogue can achieve.

The EMME-CCI has not been without its difficulties and weaknesses. Translating scientific outputs into concrete policy decisions has proved considerably harder than the quality of the scientific work alone would suggest — the gap between evidence and political action remains wide and is not bridged by scientific credibility alone. Participation across the initiative has been uneven; some countries have engaged substantively while others have remained nominal partners, reflecting the asymmetries in institutional capacity and political will that characterise the region. The governance architecture, while functional, remains dependent on a relatively small number of relationships and commitments that are themselves subject to change. Governmental discontinuity has been a persistent structural challenge: each change of administration in participating countries, including Cyprus, has required the initiative to rebuild understanding and renew commitment, a process that has generally succeeded but has resulted in significant costs in time and momentum. Financial commitments have proven difficult to consolidate and have yet to reach the level of stability that a long-term regional platform requires. These are not incidental difficulties. They are the real conditions under which science diplomacy operates in politically complex environments, and any initiative seeking to follow a similar path must anticipate and design for them from the outset.

The concluding section reflects on the broader insights that may be drawn from this experience for the evolving practice of regional science diplomacy and for the external dimension of the European Research Area.

6. Concluding Reflections: Regional Science Diplomacy and the European Research Area

The lessons drawn here should be read with appropriate caution. The EMME-CCI remains a work in progress, with re-invigorated momentum recently — significant in what it has achieved, sobering in what it has not, and notable less for its outcomes than for the distance it has travelled under conditions that would have stopped most comparable efforts at the outset. That it has reached this point at all, however slowly and with whatever fragility, is itself a finding. The conclusions that follow are not derived from a completed success. They are drawn from an unfinished experience whose value lies precisely in what it reveals about the conditions under which regional science diplomacy can function — and about the limits of what it can be expected to achieve.

Regional science diplomacy operates on a logic fundamentally different from traditional diplomatic confidence-building. Where formal channels are constrained — or, as in parts of the Eastern Mediterranean and Middle East, where states are in active conflict — shared exposure to transboundary risks can create conditions for structured scientific engagement that formal diplomacy cannot. Climate stress, water systems and energy infrastructure do not respect political boundaries; the scientific imperative to address them collectively can sustain cooperation even among parties whose relations are severely strained. This is not a peripheral observation. It is science diplomacy's most important strategic attribute.

Five conclusions follow, with direct relevance to the European Research Area and its external dimension.

The first concerns strategic coherence. Effective regional science diplomacy has generally emerged from institutional initiative and political opportunity rather than deliberate ERA strategy. What is currently missing is a framework that identifies priority regions, maps instruments of engagement, and connects regional scientific cooperation explicitly to Europe's broader strategic interests. Without it, initiatives remain episodic and their returns — scientific and political — are only partially captured.

The second concerns scientific infrastructure as a strategic asset. Access to advanced computing, Earth observation and integrated regional modelling has proved, across several initiatives, to be a decisive enabler — building analytical credibility, generating trust among politically diverse partners, and establishing a shared reference point for policy dialogue.

These European capabilities remain underutilised as instruments of external engagement. Governed and selective access to ERA infrastructures by partner countries and regional platforms would substantially strengthen Europe's science diplomacy capacity in its neighbourhood.

The third concerns the geopolitical assets that particular member states bring to science diplomacy. Geographic location, historical relationships, cultural ties and institutional anchoring at the intersection of Europe and a neighbouring region create a convening capacity that is strategically valuable and cannot be manufactured. It has nothing to do with the size of a member state and everything to do with its positioning. Recognising and supporting this function explicitly within ERA governance would allow the Union to mobilise capabilities that are currently underused.

The fourth — and in some respects most consequential — lesson concerns governance architecture, the dimension where design choices matter most because it is where institutional creativity actually operates. Effective governance for science diplomacy in complex political environments cannot be derived from general principles and applied as a template. It must be designed for the specific fractures, asymmetries and sensitivities of the particular setting. In the EMME context this meant anchoring the process in shared scientific assessment rather than political negotiation; allowing voluntary and flexible participation so that engagement required no signal of political alignment; sequencing carefully so that scientific collaboration preceded and enabled policy dialogue; and permitting subsets of participants to advance where interests converged without requiring consensus across the whole. Each choice was a direct response to conditions — active conflicts, absent diplomatic relations, asymmetric institutional capacities — that a generic framework would have failed to accommodate. Governance design should be treated as a primary task, not an administrative afterthought. The expertise to do it well must be built deliberately — and must include an honest reckoning with the fragility that is inherent to any cooperative architecture operating across political fault lines and shifting governmental commitments.

The fifth concerns the embedding of science diplomacy in ERA partnership agreements and external funding instruments. What regional experience demonstrates is the value of instruments specifically designed for science-anchored cooperation in politically complex environments — instruments that prioritise scientific credibility and flexible participation, and that do not require comprehensive political alignment as a precondition. Existing frameworks, such as those developed with the Gulf Cooperation Council, offer architecture through which this logic could be extended. The ERA Policy Agenda provides the appropriate vehicle.

The above point toward an ERA external dimension that is more than the sum of its association agreements. Strategically deployed — through shared infrastructures, geopolitically aware partnerships, purpose-built governance and instruments appropriately designed for the specific political environment considered — it can become a substantive component of Europe’s engagement with its neighbourhood: grounded in scientific credibility, guided by genuine mutual interest, and enhancing other forms of cooperation and often capable of operating where other forms of engagement cannot reach.

The principal conclusions of this paper may be summarised as follows:

- a) transboundary scientific challenges create cooperative imperatives that can function even across active conflict lines;
- b) scientifically anchored governance with flexible participation is the enabling architecture;
- c) Europe's research infrastructures are an underutilised diplomatic asset;
- d) geopolitical positioning rather than scale determines which member states can exercise a leading convening role; and
- e) science diplomacy could be more deliberately embedded in the ERA's external instruments and partnership frameworks.

About the Author:

Prof. Costas N. Papanicolas is the Founding President and President Emeritus of the Cyprus Institute. He holds Physics degrees (B.Sc., Ph.D.) from MIT and served as Special Envoy on Climate Change for the Government of Cyprus (2018–2023). He is currently Scientific Director of the Eastern Mediterranean & Middle East Climate Initiative. Member of several academies, he has received international honours for his contributions to science, education, and policy, with awards from China, Cyprus, France, Greece, Italy, Portugal and the United States.