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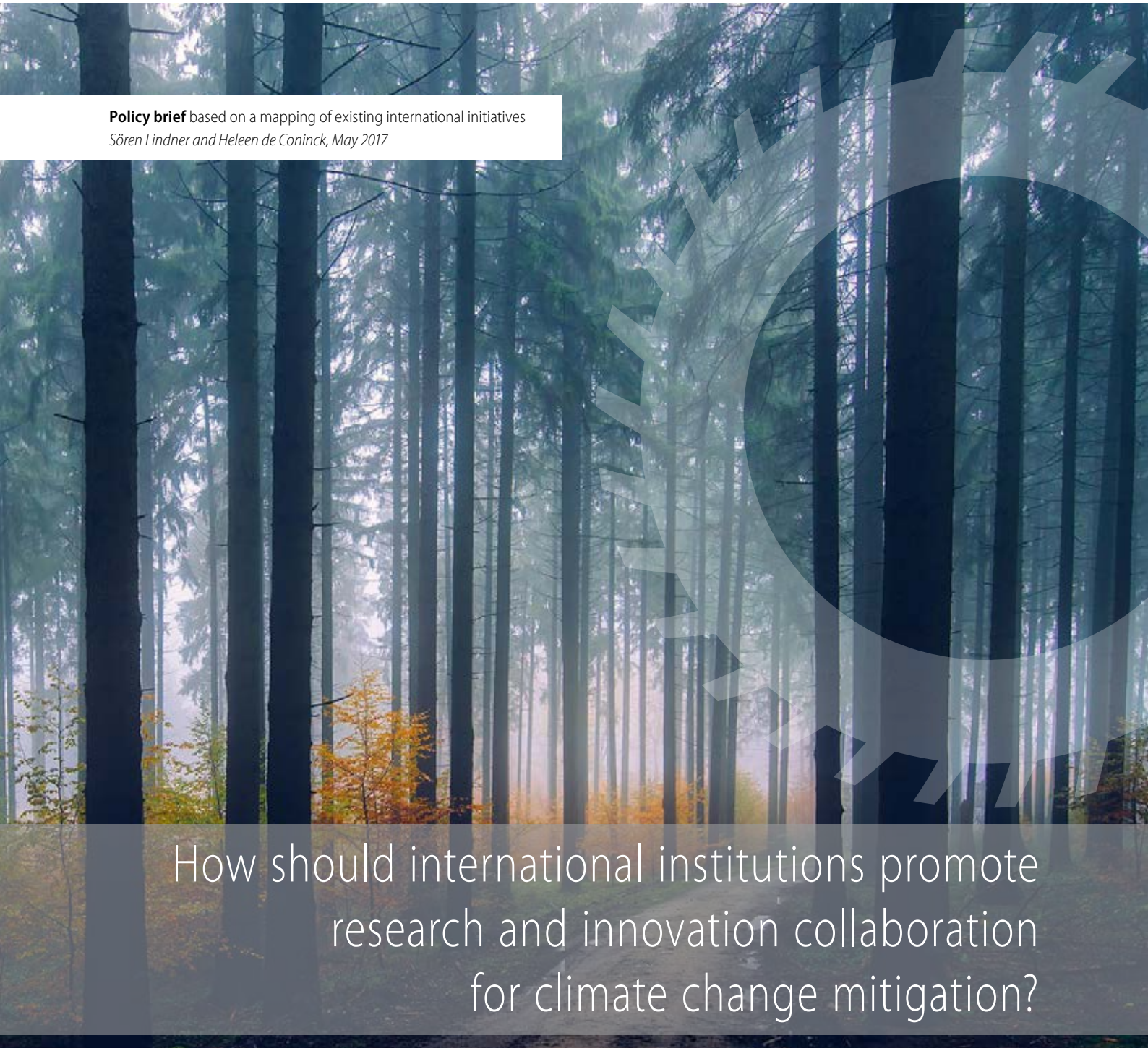
CARISMA

Innovation for Climate Change Mitigation



Policy brief based on a mapping of existing international initiatives

Sören Lindner and Heleen de Coninck, May 2017

How should international institutions promote research and innovation collaboration for climate change mitigation?

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Key messages

For international institutions to get involved meaningfully in climate change mitigation collaboration projects around research and innovation, the following guidance can be given:

> Understand what drives cooperation: only by mutual understanding can mutual interests in the long term be observed
> Clearly communicate project focus, roles and responsibilities
> Focus on project outcomes and impacts: measurable outputs are not necessarily leading to useful outcomes and impacts on climate change mitigation
> Facilitate a dialogue that enables innovation: free exchange of ideas in informal settings can create knowledge potential leading to new innovation

CARISMA Project started in February 2015 and received funding from the European Horizon 2020 programme of the EU under the Grant Agreement No. 642242. CARISMA intends, through effective stakeholder consultation and communication to ensure a continuous coordination and assessment of climate change mitigation options and to benefit research and innovation efficiency, as well as international cooperation on research and innovation and technology transfer.

Goal and context

The Paris Agreement (2015) called upon international collaboration between Parties on technology development and transfer at different stages of the technology cycle. The focus of this "cooperative action" against climate change is on both approaches, mitigation and adaptation, stressing as well to particularly include developing countries. The UNFCCC supports the outlined cooperation strategy via , o.a., the Technology Mechanism and the Finance Mechanism. However, the Paris Agreement specifically calls upon non-UNFCCC international cooperation which can occur between countries, industries and may also include academic institutions for research and innovation support. This policy brief focusses on the latter types of cooperation.

The aim of this policy brief is to provide guidance and make recommendations to international institutions on how to get involved in climate change mitigation collaboration projects around research and innovation. It does so by looking closely at experiences of past and current research and innovation collaborations in the field of climate change mitigation.

Questions we aim to answer here include:

- **To what extent is new knowledge on mitigation technology created and dispersed through the collaborated initiatives?**
- **What kinds of capabilities are developed?**
- **What are the drivers of actors to get involved in research and innovation cooperation?**
- **What are their expectations on returns?**
- **What have been potential hurdles experienced in past project collaborations?**
- **How can these be avoided in the future?**

Approach

This policy brief was drafted based on a detailed scoping and assessment of past and current region-to-region, government-to-government and industry-to-industry collaboration project initiatives between Europe and partnering regions (mainly China, Brazil, Africa, South-East Asia and India). The following criteria were used as a guide to select collaboration initiatives:

- large-scale and long-term research and innovation (R&I) collaboration initiatives
- mutual technology cooperation
- high political relevance
- mutual business interest
- focus on R&I in climate mitigation technologies

From a large pool of suitable initiatives, we selected around 30 for a closer analysis captured in a background report[1] and another five as case studies, for which interviews with project coordinators and stakeholders were conducted. In addition, a stakeholder workshop was organised in Amsterdam (the Netherlands) on 20 February 2017[2], which brought together technology, climate, and innovation policy experts and practitioners from private firms, research institutions, and research and innovation projects.

[1] Lindner, S. De Coninck, H. Tuokko, K. Behrens, A. Alessi, M. Alberola E. Clochard, G-J (2017) Climate Change Mitigation Research and Innovation Collaboration between EU and Emerging Economies. Joint Report, CARISMA. Working Document Series No. 3

[2] http://carisma-project.eu/News-Events/Events/CARISMA-Workshop-in-Amsterdam-20-February-2017

Detailed policy recommendations

Understand what drives actor involvement

While climate change mitigation may often be the overarching goal of climate technology collaboration initiatives, it may well be that individual actors have different motivations to participate. For example, a supplier of a low-emission technology may be mainly driven by new market opportunities when engaging in regional collaborations. Such differences in motivations are not necessarily bad, as long as they are not counterproductive. It is therefore important that in the process of designing a regional collaboration project the different motivations of partners are clearly understood and aligned with the overall project goal.

In one of the cases analysed, it was observed that the regional collaboration projects were merely used to test European technologies in emerging economy market; in case the technology was not successful in diffusing into the new market, the European partner withdrew from the collaboration. For partners from emerging economies collaboration is often driven by: economic stimulation, opportunities for increasing their technological capacity, and training/education of researchers and engineers.

An important aspect found in the analysed international project collaborations is trust between partners, which implies that different motivations are clear and explicit. In order to create such an environment of trust, project managers should not only identify individual partners' drivers and motivations, but also set a framework to check and balance these, so that the overarching project goal, such as climate change mitigation, is not jeopardized (e.g. avoiding domination of one partner's focus on technology export promotion).

Clearly communicate project focus, roles and responsibilities

At the CARISMA stakeholder workshop in Amsterdam, participants recommended to be clear about the use of terminology. For example, while research and development (R&D) about a technology for mitigation mainly refers to development of new technologies, which have not reached the stages of demonstration and deployment, innovation is a much broader term that also covers improving market or system conditions for proven technologies. In regional collaboration projects, it is important to be clear about the precise scope of R&D and innovation aspects of technologies for mitigation. In existing projects, the difference between these terms, however, is often not clear to project partners and so care must be taken to explain exactly the proposed research component of the collaborative initiative and its expected contribution to innovation.

Another comment at the workshop may have captured a general problem with past and current regional collaborations: "Projects need to have a clear focus and highlight the expected benefits." This comment reflects that there may indeed be a lack of focus on 'research' in collaboration initiatives, or instead that a project focus is too broad by attempting to cover too many topics. It may also mean that stated goals of the initiatives are not entirely linked to the overarching goal of climate change mitigation or that they are indeed sub-goals of partners in which case it has not been made clear that they are. In any case, we recommend that collaboration projects have a strong communication strategy that clearly outlines, how the project links to overarching goals such as mitigating climate change (expected contribution to GHG reduction may be mentioned if applicable), what the sub-goals of project partners are and how they may contribute to the overall project. It is also helpful if projects were to state potential partners that are involved in the actual research and innovation side of the project. For example, in the case of interviewing a spokesperson for the CAAST-NET Initiative, we found that climate innovation centers (CIC) have the role of facilitating innovation and that through these centers a network of international researchers is built in many developing countries. This was something not made clear on the website, but it is a helpful piece of information for potential future project initiators that look for specialists in the area of innovation and research.

Focus on project outcomes and impacts

The point of overarching goals and potential sub-goals of partners involved picks up on the need for project leaders to clearly state their expected benefits, not only in measurable outputs but more so in impacts to the community and environment (climate). One of the project coordinators interviewed for the study, repeatedly stressed the importance of creating an environment and framework that focusses on project outcomes and impact as opposed to only outputs. For example, the output of a project can be a method, with an improved ability of stakeholders to address a problem as outcome and solving the problem as impact. A lack of "outcome thinking" takes place at the level of research project management and of the sponsor, such as the European Commission. His comment also reflects to some extent the cultural context, as "outputs" are measurable and mostly within the control of the project managers, whereas "outcomes" are harder to measure since they reflect changes in public or private strategies, policies, or priorities and could take some time until showing full effect. To improve this, we recommend an "outcome and impact focus" during project design, implementation, and follow-up so that regional collaboration projects move closer towards making a difference in policy and private sector decision making.

Finally, it was found that collaborating partners shall not actively attempt to change or modify existing legislation in developing countries. The so-called "fingerprint on legislation" in developing countries by EU partnering countries ought to be avoided. Instead, focus of the initiatives ought to be solely on research and technology collaboration with the benefit of building trust between project partners. Proposed changes in institutional design could harm this relationship of trust.

Facilitate a dialogue that enables innovation

Collaboration projects on research and innovation are ultimately important to build up trust between partners. Beyond that, they often open the door for a long-term and sustained partnership between actors involved. We have seen this with multiple regional collaborations that were extended after the initial project came to an end, and it was also mentioned in interviews that long-term projects that are run in several periods are seen to be more successful in bringing a technology out of the research stage into the pilot testing- or even market diffusion stage. First-time collaborations between developed and developing countries ought to be used to open up a dialogue and to build a trustful environment in which free exchange of ideas in informal settings can create knowledge that may potentially lead to innovation in the long run. Often, effective dispersion of innovative ideas and knew knowledge that may lead to future large-scale implementation of mitigation technologies through a well-functioning collaboration depend on a time-frame that cannot be realized in only three to four years. A more formal framework that allows for a setting under which long-term research and innovation capacity involving both partners can be built, should be added after the initial trust-building phase. In this phase, technical experts can be called upon to formulate clear-cut goals on innovation, research and technological development during the projects development that may propel technologies out of the research and development phase and into the pilot phase.

Conclusion

Our scoping of international collaboration initiatives, the in-depth case studies with interviews of project leaders, as well as output from the stakeholder workshop showed that collaboration, communication, and project implementation in climate innovation can benefit from the following:

1) The motivation of all project participants to engage in an initiative needs to be made transparent and although they may differ among partners, they shall not be opposed to the overarching goals of the project.

2) An understanding that these projects are based on a mutual benefit, and that therefore needs, interests and sub-goals of all project partners involved need to be balanced.

3) A shift of focus away from "output thinking" (such as a technology project implementation), towards outcomes and impacts of projects (measurable reduction of greenhouse gas emissions as a result of project implementation).

4) Clarity on terminology and focus of projects.

5) Stimulate prolonging regional collaboration beyond the projects.