

Enhancing Collaboration between Multilateral Initiatives

A handbook for TCPs and other
clean energy initiatives



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Highlights

Enhancing collaboration between multilateral initiatives on energy technology innovation is a great opportunity to support global efforts towards net zero emissions

International collaboration has a critical role to play in supporting global efforts to accelerate clean energy technology innovation and meet global energy and climate policy goals. Collaboration typically takes place through country-driven multilateral platforms such as the IEA Technology Collaboration Programmes (TCPs), the Clean Energy Ministerial (CEM) and Mission Innovation (MI). The number of new initiatives has been increasing rapidly in recent years, including sectoral or technology-specific collaborative platforms in areas such as bioenergy, hydrogen and electric mobility.

Governments have an opportunity to enhance co-ordination and foster collaboration *between* multilateral initiatives – both existing and new ones – to broaden their reach and increase their impact while ensuring the optimal allocation of resources for international co-operation.

This handbook is based on conversations with key actors from the TCPs and other multilateral platforms relevant to energy technology innovation, as well as decision makers from IEA family countries, who have shared their experience and good practice on ways that policy makers within initiatives or government can enhance cross-initiative collaboration.

Six recommended actions for decision makers:

1. Integrate collaboration into decision-making processes.
2. Create meaningful opportunities for exchange between initiatives.
3. Adopt flexible approaches to project development.
4. Streamline legal mechanisms used for collaboration.
5. Consider the existing landscape before developing new initiatives.
6. Adopt a whole-of-government approach to collaboration.

Why this handbook?

International collaboration will be critical to meeting global energy and climate goals

The IEA [Net Zero by 2050 Roadmap](#) shows that innovation is critical to meet global climate and clean energy goals. In 2050 almost half of the CO₂ emission reductions required for net zero come from technologies that are currently at the demonstration or prototype phase. In certain hard-to-decarbonise sectors, such as heavy industry and long-distance transport, this share is even higher.

At the same time, international co-operation has a central role to play in tackling the many global challenges associated with clean energy transitions. In the area of [energy technology innovation](#), multilateral platforms can distribute the cost and risk of innovation across many actors, facilitate the exchange of ideas between sectors and across borders, enable the exchange of good policy practice among policy makers, and support market deployment by harmonising performance standards and codes.

In many areas, multilateral platforms are already working to accelerate innovation and co-ordinate deployment to scale up clean energy technologies. Within the framework of the IEA, [the Technology Collaboration Programmes](#) (TCPs) provide a platform for governments to work together to advance research, development and commercialisation of energy technologies. As of 2021 there are 38 TCPs, each focusing on specific energy technology areas.

Even with the many success stories among existing international initiatives, governments need to redouble their efforts to meet net zero ambitions. To reach the targets of the IEA Net Zero Emissions by 2050 Scenario, international collaboration needs to accelerate across the board. Without effective co-operation on technology innovation, deployment and standardisation, the transition could be delayed by decades.

Co-ordination between multilateral initiatives can enhance impact and save resources

To maximise the impact of international collaboration efforts in addressing global energy and climate challenges, governments have the opportunity to [pursue synergies between multilateral initiatives](#). Multilateral initiatives stand to benefit

from the sharing of information, data and ideas, as well as the exchange of good practice and experience of other initiatives (e.g. in their organisation, structure, processes and even funding).

In recent decades there has been growing recognition of the need to consider individual technologies within the context of the entire energy system. Individual technologies may compete with each other across different contexts, or by contrast act as a mutual enabler (e.g. utility-scale energy storage enabling the integration of high shares of renewables). Developments in one sector or technology area may spill over and have a positive impact on opportunities elsewhere (e.g. electrochemical approaches to carbon capture based on learnings from battery technology development). Co-operation between multilateral initiatives focusing on specific technology areas can help overcome the danger of individual technologies developing in a vacuum.

In the particular instances where multiple initiatives address [overlapping technology areas](#), governments may need to regularly review the purpose and priorities of the existing landscape of multilateral platforms. Such a review can ensure that activities complement and build on each other, and continuously add value to global efforts. This is particularly important when new initiatives are proposed. These early stages provide a prime opportunity to adapt the scope so that new initiatives complement the work of existing platforms, identify avenues for collaboration and avoid the risk of duplication.

The TCP modernisation strategy puts cross-initiative collaboration at the centre

The IEA has been working to modernise and enhance the TCP mechanism to ensure that the TCPs are well equipped to respond to future innovation challenges. Encouraging and supporting cross-initiative collaboration is central to this effort.

In April 2020 the IEA Governing Board approved a new legal framework for the TCPs, which provides new engagement tools and encourages creative approaches to co-operating with other multilateral initiatives. In parallel, the IEA Secretariat has expanded its support for TCPs seeking to develop cross-initiative collaborations and has deepened its own engagement with other multilateral initiatives beyond the TCP network. This includes providing support for co-ordination activities between initiatives and facilitating connections with the aim of identifying new opportunities to work together.

There is enormous scope for the TCPs to work with complementary platforms to accelerate innovation

In addition to the TCPs, there are other collaborative platforms on clean energy technology under the umbrellas of [Mission Innovation](#) (MI) and the [Clean Energy Ministerial](#) (CEM). These two platforms can complement each other and the TCPs by bringing together slightly different groups of stakeholders and focusing on clean energy technology challenges in a way that drives synergies.

MI Missions are government-led collaborations gathering different national research teams – and private-sector actors in some instances – to focus on a selection of research, development and demonstration (RD&D) challenges and foster the sharing of knowledge and good practice. CEM Initiatives are also government-led collaborations, seeking to expand the demonstration and deployment of clean energy technologies, policies and practices, but are aimed primarily at policy makers. There are already examples of collaboration between different platforms, such as the International Smart Grid Action Network (ISGAN) TCP, which is also a CEM Initiative. Some of these examples feature in this report and allow us to draw lessons from their success stories to inform future efforts.

Successful collaborations often share four core characteristics

In developing this handbook we relied on a series of interviews with representatives from multilateral collaboration platforms that draw from the TCPs, CEM Initiatives and MI Missions, among others. From these discussions we identified four core characteristics that are commonly shared by successful collaborations between multilateral platforms:

- 1. Strong common interest in the specific topic across key stakeholders.** Collaboration is more likely if multiple initiatives assign a high priority to a common topic, clear goal and strong aim to make difference. Collaborative activities compete with other priorities and it can be difficult to allocate resources to a new project without strong commitment to the topic.
- 2. A “champion” or core group to shepherd an idea through the development stage.** Whenever multiple groups are involved in a project, there is often a risk that competing priorities will make it difficult for all participants to fully commit to carrying out the necessary development and administrative tasks. It can be useful in these contexts to have a single individual, organisation or core group of several actors that is truly committed to developing the collaboration and willing to carry out the administrative tasks while encouraging others to provide input along the way. Notably, however, in these cases there is a risk that other participants take a step back or seek the free-riding advantages of being part of a collaborative

project. A successful champion will work to ensure that all participants contribute actively.

- 3. Availability of resources for collaborative projects.** An adequate allocation of funding and people is critical to the development of new collaborative projects. Excellent ideas for collaboration across multilateral platforms are likely to falter if insufficient resources are available.
- 4. Processes or incentives for collaboration.** Initiatives that have formalised procedures for collaboration are often more successful at identifying opportunities and following them up. Incorporating collaboration into decision-making procedures ensures that opportunities are explored at an early stage. Without institutional procedures, initiatives generally rely on personal connections, which can be inconsistent and difficult to maintain.

Based on these common characteristics, we have identified six key recommendations for decision makers – in government and in collaborative platforms of all kinds, including but not limited to the TCPs – seeking to strengthen co-operation between multilateral initiatives:

- 1. Integrate collaboration into decision-making processes.**
- 2. Create meaningful opportunities for exchanges between initiatives.**
- 3. Adopt flexible approaches to project development.**
- 4. Streamline legal mechanisms used for collaboration.**
- 5. Consider the existing landscape before developing new initiatives.**
- 6. Adopt a whole-of-government approach to international collaboration.**

The following chapters explore each of these recommendations, drawing on examples from the TCPs and other initiatives. We refer, where possible, to model templates available on the online [TCP Guide](#) that may serve as examples for other initiatives.

Case study: The number of multilateral initiatives focusing on hydrogen technologies has increased in recent years

The technology area of hydrogen illustrates how collaborative initiatives have proliferated in different forums and with different groups of stakeholders. While some initiatives were already in operation pre-2015, they multiplied in recent years.

Where multiple initiatives exist, co-operation can build on their complementary characteristics, such as their specific focus area, membership or participants, and target audience. For example, the CEM Hydrogen Initiative (H2I) and the MI Clean Hydrogen Mission (CHM) currently consist of government representatives, whereas the World Economic Forum's Accelerating Clean Hydrogen Initiative involves both public and private sector participants. The Hydrogen TCP, CEM H2I and MI CHM each have a slightly different set of participating countries and target different stages of the innovation chain. Co-operation can increase the impact of each initiative's work by involving a wider variety of stakeholders to reach a broader audience, and by addressing resource-push and market-pull [levers of innovation](#).

Selected multilateral initiatives focusing on hydrogen technologies

Year	Initiative	Membership	Primary focus
1977	Hydrogen TCP	Government, research, industry	Technology RD&D and global analysis
2003	International Partnership for Hydrogen and Fuel Cells in the Economy	Government	Policy approaches, standards, deployment
2017	Hydrogen Council	Industry	Awareness, policy recommendations, industry co-ordination
2018	Hydrogen Energy Ministerial	Government	Political forum, stakeholder mobilisation
2018 - 2021	MI Challenge 8 on Renewable and Clean Hydrogen	Government	Technology RD&D and global analysis
2019	CEM Hydrogen Initiative	Government	Scale-up, deployment
2020	International Renewable Energy Agency (IRENA) Collaborative Framework on Green Hydrogen	Government, industry, international organisations	Global analysis, stakeholder mobilisation
2020	World Economic Forum (WEF) Accelerating Clean Hydrogen Initiative	Industry, international organisations	Stakeholder mobilisation
2021	MI Clean Hydrogen Mission	Government	Technology RD&D and global analysis

1. Integrate collaboration into decision-making processes

Summary

- Successful collaborations often grow out of a personal commitment or pre-existing professional ties between individual participants of an initiative. While personal connections are critical to developing new collaborations, they can be less reliable and depreciate over time as well as following changes of personnel.
- Introducing procedures designed to integrate collaboration into decision-making can support these more ad hoc methods by establishing collaboration as standard practice across the board, in a way that can avoid relying on individuals' personal networks and survive subsequent changes of personnel. Over time, following procedures that require individuals to explore collaboration can help to embed the notion into the culture of the initiative.
- Such procedures can take many forms, including incorporating collaboration into official mission statements, and establishing procedural steps that ensure participants systematically explore collaborative opportunities and develop new professional ties.

While personal or individual ties can facilitate collaboration, these arrangements can be fragile

Individual participants' strong personal commitment to fostering collaboration can encourage effective joint work. A handful of TCPs have reported a shift in their internal culture following the selection of a new chair or secretary. In these cases, the change of personnel has led to an increase in collaborative initiatives. In parallel, personal contacts often facilitate interaction between active initiatives. For example, where a specific individual participates in more than one related initiative, they are likely to develop contacts in both groups and by extension help identify mutual opportunities.

Across multilateral initiatives, these personal factors have been a crucial driver of fruitful collaboration. While acknowledging their advantages, overreliance on personal commitment and connections involves risks as well. For one, personal connections may be limited to existing contacts, which can introduce an element

of bias to new developments. In addition, some participants may be reluctant to reach out to personal connections and would prefer a standardised approach to outreach.

Critically, several initiatives have noted that a change of personnel can disrupt collaboration, leading to missed opportunities and a break in continuity. This can be particularly problematic for international initiatives where personnel changes and rapid turnover are common. After a person leaves an initiative, the institutional memory, personal connections and potential for collaboration may be difficult to recover. The Hybrid and Electric Vehicles (HEV) TCP noted, for example, that ad hoc exchange of information with the CEM Electric Vehicles Initiative had previously been facilitated by an overlap in individual membership on their respective steering committees. Following a change of representation, it has been more challenging to maintain these connections.

New procedures that normalise collaboration can reinforce and complement ad hoc approaches

Establishing procedures that formalise collaboration within decision-making processes can mitigate the risks of over-reliance on individuals. Although the specifics of these approaches vary considerably, what they all have in common is that they ensure that collaboration opportunities are systematically explored. When used effectively, these mechanisms can both ensure that individual and personal connections survive changes of personnel, and facilitate development of new connections over time.

Incorporating collaboration within the official policy goal or mission statement of a multilateral initiative can help build common recognition that working with others is important and reduce reliance on the individual commitment of participants. Mission statements, policy statements and similar documents all help to define the measures of success for the initiative, forcing participants to ask themselves the question: “Have we explored external collaboration that could increase our impact?”

For example, ISGAN, which is both a TCP and a CEM Initiative, found that the most significant internal driver of actively seeking to work with others was having the concept of collaboration embedded within its programme of work. ISGAN representatives noted that the TCP mechanism as a whole is inherently co-operative, as every TCP is ultimately a collaborative initiative among several governments. Because collaboration is already at the core of the TCP’s existence, it should be seen as intrinsic in the way the TCP operates in all its activities. By

including collaboration within its programme of work, ISGAN has reoriented discussion towards collaboration whenever new activities are developed.

The User-Centred Energy Systems (Users) TCP has similarly included collaboration within its overall mission statement and has made it a basic requirement that all new activities (known as Tasks) consider options for collaboration, including with other TCPs. Users TCP representatives explained that their mission incorporates collaboration because of the cross-cutting nature of their overall topic, which benefits greatly from interaction with other multilateral initiatives and stakeholders. This also means that the collaborative extent of proposed new activities is considered as a criterion when deciding whether the activity is consistent with the TCP's overall programme of work and long-term strategy.

Some initiatives, such as the Solar Heating and Cooling (SHC) TCP, have also developed a separate written strategy or policy on collaboration with other TCPs and multilateral initiatives (see Box "Setting collaboration with other clean energy innovation initiatives as one of the core principles of Mission Innovation"). Even if seeking collaboration with other initiatives is not regarded as one of the core missions of the TCP, an official policy helps participants to recognise it as an effective strategy to meet the TCP's goals while conserving resources.

Incorporating collaboration within the initiative's official policy or work plan can create additional incentives for participants to seek out mutual opportunities, particularly if participating countries look at the level of co-operation when evaluating overall performance. Over time, this can help to encourage strong individual commitment to pursuing joint working among all participants and temper the impact of personnel changes.

Case study: The SHC TCP has introduced internal policies to maximise collaborative opportunities and foster a culture of co-operation

The SHC TCP established a Policy on Collaborative Tasks with other IEA TCPs in 2016. The policy sets out four levels of collaboration depending on the needs of the particular project and the interest levels of other TCPs:

- 1. Minimum:** The SHC TCP is responsible for defining and managing any Task activities, including preparing the documentation, work plan and communication plan. The other initiative is able to select experts to participate in the Task with the same rights and responsibilities as SHC experts. Examples

include collaboration with the Photovoltaic Power Systems (PVPS) TCP in Tasks 59 on Historic Renovation and 60 on Photovoltaic/Thermal Systems, and the SolarPACES TCP in Task 62 on Industrial Water and Wastewater Management.

- 2. Moderate:** The SHC TCP is responsible for defining and managing Task activities, but the other initiative can provide input during the definition of the Task, including preparing the documentation, work plan and communication plan. At this level of collaboration, both initiatives make efforts to resolve differences and the SHC TCP is prepared to make the changes proposed by the other initiative. Unlike in minimum collaboration, the other TCP may also develop a parallel Task in their TCP based on the same activities. Examples include collaboration with the Energy in Buildings and Communities (EBC) TCP on Task 59 on Historic Renovation (Annex 75 in the EBC TCP) and Task 61 on Lighting (Annex 77 in the EBC TCP).
- 3. Maximum:** The SHC TCP is responsible for managing Task activities, but all Task activities are jointly defined with the other initiative. At this level of collaboration, both initiatives agree on the documentation, work plan and communication plan, and on any revisions once the Task is underway. As with moderate collaboration, the other TCP may also develop a parallel Task in their TCP based on the same activities. No maximum level collaborative Tasks have yet been implemented.
- 4. Joint:** The SHC TCP and the other initiative are jointly responsible for defining and managing Task activities. The Task documentation, work plan and communication plan are jointly agreed and both initiatives agree on any revisions. For management, each initiative (usually a TCP) assigns a separate Task Manager who work together to carry out the Task activities. Examples include collaboration with the Energy Storage TCP on Task 58 on Storage (Annex 33 in the Energy Storage TCP) and with the SolarPACES TCP on Task 64 on Solar Heat in Industrial Processes (Task IV in SolarPACES).

Using procedures to standardise collaboration can ensure that participants explore collaborative opportunities as a matter of course. These steps encourage participants to consider whether a specific project proposal could benefit from collaboration with external groups. In addition to encouraging participants to familiarise themselves with their peer organisations, a clear policy can encourage proponents to develop new informal and formal connections with other initiatives.

These procedures can be introduced on a project-by-project basis or can be topical. The Energy Storage TCP, for example, adopts a topical focus whereby participants actively explore co-operation with other initiatives that have previously

shown an interest in their work or topical focus area. In other words, the TCP as a matter of course reaches out to other TCPs or initiatives with similar interests to exchange ideas and seek new joint opportunities.

Other initiatives have adopted a project-by-project approach. As mentioned above, the SHC TCP has incorporated collaboration into the steps that technical experts have to undertake during the development of a new Task or project. The TCP's template Concept Paper includes a section for proponents to provide details of potential overlap with other initiatives and to explain whether the topical focus cuts across other ongoing TCP Tasks. Additionally, proposers are asked to identify institutions in the TCP's member countries to work with and estimate their respective value to the concept. During this stage, some Task proponents have secured commitment letters from potential collaborators, which provide clarity on the nature of the co-operation before the creation of the Task itself.

There are quick-win opportunities for initiatives to set up simple procedures to explore collaboration – examples show that they need not be complex. They can be as simple as including a dedicated space within a proposal template inviting proponents of a new activity to discuss opportunities for collaboration. However they are implemented, opportunities for joint working should ideally be considered early in the process of developing new activities. Several initiatives noted that exploring collaboration opportunities at an early stage provides time to re-evaluate and redirect potential projects according to work going on in other initiatives.

Case study: Setting collaboration with other clean energy innovation initiatives as one of the core principles of Mission Innovation

Mission Innovation (MI) is a [global initiative](#) of 22 countries and the European Union working to catalyse action and investment in RD&D to make clean energy affordable, attractive and accessible for all. MI was announced in 2015, as world leaders came together in Paris and committed to seek to double public clean energy RD&D investment over five years.

The first phase of MI (2015-2020) included the launch of [eight Innovation Challenges](#) (ICs) co-led by members and covering a broad range of energy technology areas, including smart power grids and off-grid access, carbon capture, biofuels, solar, clean energy materials, heating and cooling, and hydrogen. In May 2021 MI members gathered at the [Sixth MI Ministerial](#) to launch a decade of clean energy innovation for the second phase of MI (2021-2030), including [three new](#)

[Missions](#) on integrating very high shares of renewables onto the grid, zero-emission shipping and clean hydrogen. Proposals for other Missions are being examined for potential launch, including: bio-based fuels and chemicals; carbon dioxide removal; industry decarbonisation; and cities.

Strengthening co-operation with other multilateral initiatives for clean energy innovation ranks among MI's core principles. Specifically, MI members committed in their [joint member statement on the launch of MI 2.0](#) to “accelerate innovation through strengthened international co-operation in areas of mutual interest [... and] support co-ordination through their engagement with other clean energy alliances and initiatives.” Setting collaboration as a core principle of MI has had practical implications on the design of new initiatives, including requirements to be inclusive of other collaborative platforms.

For example, the [Clean Hydrogen Mission](#), which aims to “catalyse cost reductions by increasing RD&D in hydrogen technologies and industrial processes and delivering at least 100 hydrogen valleys covering production, storage and end-use worldwide by 2030”, invited existing platforms to become partner organisations and inform its work before it kick-starts activities in 2021-2022. These include the Hydrogen Initiative under the CEM, the International Partnership for Hydrogen and Fuel Cells in the Economy, the United Nations' Green Hydrogen Catapult, and the WEF's Accelerating Clean Hydrogen Initiative, among other partners. The 16 co-lead and coalition countries of the Mission are also members of the [Hydrogen TCP](#) (with the exception of Chile, Morocco and Saudi Arabia). [IC8 on Renewable and Clean Hydrogen](#) developed into the Clean Hydrogen Mission, building on the work in the first phase of MI and expanding its membership to include Korea and Morocco. MI members who also participate in other multilateral initiatives have an important role to play in looking for synergies with existing joint activities, so that each collaborative platform keeps adding value to the global ecosystem.

Similarly, the [Zero-Emission Shipping Mission](#) involves the Global Maritime Forum, representing the Getting to Zero Coalition, and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, to increase engagement with the private sector. The [Green Powered Future Mission](#), which builds on the achievements of [IC1 on Smart Grids](#), engages with the [ISGAN](#) TCP, which is also a CEM Initiative.

Case study: Efforts to encourage collaboration among Clean Energy Ministerial work streams

The [Clean Energy Ministerial](#) (CEM) brings together a community of the world's largest and leading countries, companies and international experts to help accelerate clean energy transitions. The CEM comprises 28 countries and the European Commission, on behalf of the European Union, working on [21 current initiatives and campaigns](#) across clean energy sectors for an inclusive energy transition. The CEM was announced in 2009 in Washington, DC, and the United States will chair again in 2022 for CEM13.

Major CEM [successes](#) include: 14 billion high-efficiency lighting products sold under the Global Lighting Challenge; 50 000 ISO50001 certifications under the Energy Management Campaign; installation of over 1.7 million smart meters under efforts led by ISGAN (which is both a TCP and a CEM Initiative); and over 100 signatories on the Drive to Zero campaign.

Every CEM Initiative builds collaboration into its basic framework, with each initiative selecting an international co-ordinating body (e.g. the IEA, IRENA, the United Nations Industrial Development Organisation and the US National Renewable Energy Laboratory) and a variety of public and private partners. They then collaborate with other CEM Initiatives as well as complementary international efforts.

For example, Brazil alongside 18 other countries launched the [Biofuture Platform Initiative](#) in 2017 as an [independent initiative](#), which later became a CEM Initiative at CEM11 in 2020. It works closely with the Bioenergy TCP, IRENA, the Global Bioenergy Partnership and the United Nations Food and Agriculture Organization to organise workshops and prepare reports to raise the visibility of international bioenergy activities and promote public-private collaboration for commercial-scale global bioenergy technology deployment.

The CEM Secretariat also actively works to encourage co-ordination across different initiatives. A recent example is the [Horizontal Accelerator for Power System Integration of Electric Vehicle Infrastructure](#), established in 2020 to co-ordinate work between four different CEM Initiatives focused on the power and transport sectors: the 21st Century Power Partnership, Electric Vehicles Initiative, Power System Flexibility Campaign, and ISGAN. The Horizontal Accelerator engaged over 75 international experts from 18 countries and many initiatives across the electric vehicle and power system sectors for collaborative activities. Released at CEM11, the special report on [Electric vehicle and power system integration: Key insights and policy messages from four CEM work streams](#) highlights how initiatives, countries, companies and experts can work together to address concerns at the intersection of electric vehicle charging and power grids.

2. Create meaningful opportunities for exchange between initiatives

Summary

- Informal exchanges are an important avenue for multilateral initiatives to remain aware of their respective activities, explore new ideas and co-develop projects. However, some informal exchanges may be particularly difficult to replicate in a virtual setting and may lead to gaps in interaction.
- Careful planning can help initiatives ensure that events are more focused on identifying areas for collaboration, bring together a broad group of participants, allow ample opportunity for discussion and facilitate an open exchange of ideas that can serve as a basis for future work.
- Many mechanisms exist to foster these exchanges, including hosting events aimed at encouraging collaboration – either in a general or project-specific sense – inviting representatives from external groups to attend regular meetings and adopting interactive meeting structures that create opportunities for candid discussion.

Informal and unstructured exchanges are an important, but limited, avenue for developing collaborative projects

Many successful collaborations begin through informal or ad hoc exchanges of information and ideas that develop further over time. The SHC TCP, for example, reported that most of their ongoing collaborative efforts began at a minimal level, with only an initial exchange of information before eventually growing into joint projects.

Critically, this means that mutual opportunities may not develop where there is no ongoing contact between initiatives. The SHC TCP also reported that most of its collaborative partnerships grew out of informal exchanges with other TCPs. While the TCPs have multiple avenues for informal exchange facilitated by the IEA Secretariat, the Working Parties and the TCP Coordination groups, to date there have been fewer opportunities for the TCPs to exchange with other multilateral initiatives. Perhaps as a result, there have been fewer collaborative projects between the TCPs and other groups.

Initiatives have also noted that not all meetings build opportunities for this kind of exchange. Hence, the nature, structure and focus of an event can affect whether participants have opportunities to exchange ideas and information. In this regard, the Covid-19 pandemic has greatly reduced opportunities for informal exchange connected to meetings previously held in person.

The move to fully virtual meetings in 2020 has led to many benefits, such as reduced travel time, higher participation rates and time efficiency. Many initiatives are exploring whether to continue holding at least some meetings and workshops virtually. However, several noted that it is difficult to incorporate fluid, unstructured discussions within virtual meetings. Without this, meetings are less likely to facilitate the exchange of ideas that can build into joint work over time.

Careful and deliberate planning can ensure that meetings create meaningful opportunities for exchange

To overcome these barriers, the TCPs and other multilateral initiatives should proactively facilitate exchange between experts from different initiatives and prioritise small group discussions at in-person and virtual events. A number of different strategies are available to help ensure that events bring together a broad group of participants, allow ample opportunities for discussion and facilitate an open exchange of ideas that can serve as a base for future work.

General discussions focusing on collaboration can provide dedicated opportunities for initiatives to discuss potential joint projects and develop new project ideas. By organising a discussion explicitly around collaboration, organisers can reduce reliance on indirect exchanges and accelerate the identification of new areas for working together. These types of events are particularly helpful when they include a regular group of participants as this allows individuals to get to know each other, allowing for a smoother flow during discussions.

Many TCPs noted that the TCP Coordination Groups are one of the most important opportunities they have to exchange with one other. As the Coordination Groups are annual or biannual, they provide a regular opportunity for the TCPs to showcase what they are working on and to generate awareness of upcoming projects across many TCPs. Facilitated by the IEA Secretariat and the End-Use Working Party cabinet, the Coordination Groups are also good opportunities for the TCPs to seek feedback from the IEA on their existing work and for the IEA to learn from and provide input into ongoing projects.

Some TCPs recommended increasing the frequency of these types of meetings. More regular meetings would allow more time for participants to develop ideas together, exchange information and find means of collaboration, potentially working together over a series of meetings to develop and refine specific proposals. The TCPs also suggested that ad hoc small groups might be formed following a Coordination Group meeting to allow interested participants to have more regular follow-up on a specific idea in the interim before the next meeting.

The Energy Storage and Hydrogen TCPs also emphasised the value of being part of a larger network covering many different aspects of the energy system. The Coordination Groups represent an opportunity to bring together many different TCPs to systematically develop collaboration. Having a good understanding of what the portfolio of TCPs are working on allows all parties to take advantage of the breadth of the TCP network and ensures effective information sharing across the network.

At the same time, there are risks that a network like the TCPs may become insular if co-ordination meetings are closed to other potentially interested groups. Co-ordination meetings can be particularly effective where they bring together groups that would potentially not otherwise engage (see Box below). Thus, organisers should consider open participation that is not limited to a specific group or set of initiatives.

Case study: International Hydrogen Coordination Group

The International Hydrogen Coordination Group, co-ordinated by the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE), meets quarterly to bring together different multilateral actors working on hydrogen. Regular participants include the Hydrogen Council, the IPHE, IRENA, the CEM, MI, the WEF, the IEA, the Hydrogen TCP, the Advanced Fuel Cells (AFC) TCP and others. The purpose of the meeting is to discuss current projects, develop ideas for future work, leverage synergies and avoid duplication of effort.

The Coordination Group meetings are informal in nature, which allows for fluid conversation and encourages the participation of newcomers to the network. Their informal nature has been particularly useful for connecting the proponents of new projects with participants from other initiatives that may have an interest.

The Hydrogen TCP has noted that the Coordination Group meetings have helped to ensure that resources are used efficiently and to promote synergies between different hydrogen initiatives, which has become increasingly important as new

hydrogen initiatives have proliferated in recent years. It has been particularly valuable for the TCP in that it broadens the initiatives that the Hydrogen TCP interacts with well beyond the TCP network.

Inviting other multilateral initiatives to Task definition discussions can be vital for fleshing out the details of a specific collaboration. While general co-ordination meetings can help to identify potential ideas, more focused meetings are needed to define the contours of working together.

The SHC and Users TCPs both highlighted that the most fruitful phase to spark successful collaboration is in the early stages of developing a new Task. In many initiatives, this stage is usually marked by a workshop or other event where participants get together to specify a proposal. Inviting external representatives at this stage allows participants from other initiatives to help shape the proposal in a collaborative fashion and to ensure there are good synergies with work ongoing elsewhere.

Some TCPs have also noted the value in hosting early development meetings *jointly* with other initiatives. These early exploratory meetings help to align objectives and responsibilities from the beginning of a project to effectively develop ideas and carve out respective responsibilities. For example, the Hydrogen TCP arranged exploratory meetings between the Advanced Motor Fuels (AMF) TCP, Bioenergy TCP and Wind TCP on a range of topics of common interest to identify synergies between Tasks at the early stages of development. This has sometimes progressed to include hosting joint workshops on a specific topic.

Routine exchanges of information between initiatives can help to facilitate collaboration by ensuring that new developments are systematically shared across initiatives. Several initiatives noted the value of routinely inviting others to participate in their meetings. This can increase the range of perspectives when developing ideas or projects and help both sides to understand where the opportunities to work together might be. If taken one step further, these standing invitations can also provide regular opportunities to seek outside input into the development of new Tasks and projects. The AMF and HEV TCPs regularly present proposed and ongoing projects at each other's Executive Committee meetings, which allows this sort of exchange. Under the MI mechanism, representatives from each Innovation Community and Mission gather regularly in a virtual setting to take stock of progress, share good practice and identify

synergies and potential for collaboration between each other as well as with other multilateral initiatives.

Relatedly, some initiatives have experimented with organising back-to-back meetings with other TCPs and multilateral initiatives. In addition to building ties between the two organisations, this can also help to build wide-reaching ties between the individual participants, which can lead to additional opportunities to work together.

Informal exchanges need not just be scheduled around a certain thematic topic or have a distinct sectoral focus. The Hydrogen TCP, AFC TCP and Tokamak Programmes (CTP) TCP have noted the benefit of hosting informal exchanges among the TCP Secretaries to discuss day-to-day challenges of managing TCPs and tools to overcome them.

Adopting an interactive approach to meetings can create more fluid exchanges that contribute to the development of new ideas. Almost all initiatives have stated a preference for meetings that incorporate interactive features, particularly small group discussions. Feedback from the 2019 TCP Universal Meeting showed that small-group breakout discussions were among the most helpful, and many asked that future meetings include this type of interaction in their design. TCPs have also requested that Coordination Group meetings incorporate breakout sessions designed specifically to facilitate development of co-operative projects. Ahead of the launch of new Missions in 2021, MI has also made use of interactive break-out sessions during online workshops, gathering member country representatives and external experts, organisations and initiatives. Participants had the opportunity to provide input on work proposals and discuss potential collaboration or partnerships.

Interactive sessions are even more critical for virtual meetings, where there are often very limited opportunities to interact with other attendees. In addition to breakout discussion groups, virtual meetings may also be able to take advantage of new collaboration tools, such as live polling and digital workspaces.

Collaborative discussions should be as open as possible to encourage the development of new connections and partnerships. Where a broader network exists, such as the TCP network or the network of CEM Initiatives, exchange between different initiatives may be common. However, it may require a concerted effort to bring in new partners in order to reach beyond these existing networks. Meetings and events represent an opportunity to bring in new collaborators and to expand the group that participants regularly interact with.

Many TCPs have a regular practice of inviting other multilateral initiatives as observers to their meetings so as to open up a dialogue. Similarly, the IEA Secretariat has actively invited other multilateral initiatives to participate in TCP-related events where appropriate, to build awareness of the work being carried out among the TCPs and related initiatives.

Case study: C3E International as a forum for high-level engagement on gender

Clean Energy Education and Empowerment (C3E) International is a “dual-hatted” initiative that is both a TCP and a CEM Initiative. It aims to advance the transition to a low-carbon economy through women’s participation in the clean energy technologies sector.

C3E International has organised high-level exchanges at the [CEM 12-MI 6](#) and alongside the IEA Ministerial event in 2019. These exchanges brought together participants from the CEM, MI, the IEA and other initiatives such as the Global Women’s Network for the Energy Transition (GWNET) to discuss new strategies to attract, support and sustain all the talents and voices, particularly women, in the clean energy sector. The participants in C3E International have used these events to showcase their ongoing work streams, with the aim of developing new collaborations to further the C3E International mission.

Case study: Informal and formal exchanges between the TCPs and the European Technology and Innovation Platforms

The European Commission created the [European Technology and Innovation Platforms](#) (ETIPs) to bring together energy sector stakeholders and experts to help the European Union deliver on its [strategic energy technology goals](#) through collaborative work. ETIPs are industry-led communities and their specific mandate is to “promote the market uptake of key low-carbon energy technologies by pooling funding, skills and research facilities”. There are currently ten active ETIPs, focusing on battery technologies, bioenergy, wind, geothermal, ocean energy, solar, heating and cooling, smart grids, nuclear, and carbon capture and storage.

As part of their work, some ETIPs seek to interact regularly with other existing multilateral initiatives, including the TCPs. While there is no general, formalised collaboration between ETIPs and the TCPs, some ETIPs typically organise annual workshops inviting TCPs to share information, latest analyses and good practice

approaches, discuss respective priorities and upcoming projects, and identify possible areas for collaboration. One example was [ETIP Wind](#) in 2020. They also provide opportunities for the TCPs to interact with actors from the European Energy Research Alliance, an association of about 250 research institutions spread across Europe.

There are other examples of more formalised co-operation between ETIPs and the TCPs. In 2020 ISGAN TCP and the ETIP Smart Networks for Energy Transition (SNET) signed a [memorandum of understanding](#) to co-operate on energy research and innovation. A key strength of this agreement, identified by the two initiatives, was their complementary membership base: ISGAN is mostly made up of public entities, while SNET includes many private-sector organisations. One example of joint activity is a collaboration between ISGAN Annex 6 and SNET's Working Group 1 on [flexibility to support power grid resilience](#). In 2019 ETIP SNET published an in-depth analysis and [mapping](#) of European and global initiatives active in energy innovation. It identified possible gaps in the global ecosystem and avenues for collaboration between existing multilateral platforms, including the TCPs, CEM Initiatives and MI activities.

3. Adopt flexible approaches to project development

Summary

- Multilateral initiatives often have different approaches to their activities, including particular processes and procedures and unique funding models. Where two initiatives have different approaches, the mismatch can create a barrier to collaboration.
- The first step in resolving these differences is to seek out and use as a foundation the commonalities between different organisations. Initially this may focus on informal activities like information exchange, but can also include larger projects where there is common ground.
- Where there is a true mismatch, initiatives can adopt flexible models that allow deviation from the “business-as-usual” approach for collaborative projects. This can allow participants to use a different approach than they are used to in order to align with the approach of other initiatives.

Mismatches in legal structure between initiatives can make it difficult to develop joint projects

It is typical for multilateral initiatives to have a different approach to organising and carrying out their activities. Where two initiatives have a similar approach, common legal structures may serve to facilitate joint work to the extent that both sides are already familiar with the relevant processes. However, where legal structures do not align, it can pose an obstacle to collaboration if the initiatives involved are unable to agree on a structure for joint work that meets both of their expectations.

The legal and structural variations among the TCPs illustrate this point, and differences between the TCPs and other initiatives such as MI and the CEM are other good examples. Across the TCP network a variety of institutional frameworks are in use with respect to Task development and funding. For example, while some TCPs are based on a task-shared structure – where all contributions are in-kind – others carry out their work on a cost-shared basis – generally based on an annual fee paid to the TCP. If two TCPs use different funding structures, it can be difficult to agree on a path forward for a Joint Task that works for both sides.

Apart from funding, there are also differences in how the TCPs approach their work programmes. Many TCPs primarily conduct their work by undertaking a series of three- or four-year-long Tasks that together constitute a single large project. Other TCPs, however, carry out their work under a single overarching programme of work, with most individual projects carried out on a short-term basis – as short as three months. In addition to the obvious difficulty of timing misalignment, there may also be procedural misalignment if one TCP seeks to formalise the expectations for the joint work in a single document – generally known as an Annex among the TCPs – while the other TCP requires something different.

In addition to legal structures, there may be practical differences. Some TCPs assign individual Task Managers the duties relating to managing an ongoing Task and reporting to the Executive Committee on its progress. The SHC TCP has noted that its typical reporting requirements can be cumbersome for the Task Manager of a Joint Task if they must report to two sets of Executive Committees. These practical difficulties are even more complicated if collaborative activities involve more than two initiatives.

While these examples are rooted in experiences shared by the TCPs, similar dynamics may be observed in other collaborative projects. When trying to organise joint activities across different networks, these differences can be compounded. In general, initiatives within a broader network, such as the TCPs, CEM Initiatives or MI Missions, have some structures in common. For example, all three include the ability to appoint a single individual or organisation to carry out co-ordination and administration activities, although the title of this role is different in each. However, there are likely to be fewer commonalities when initiatives seek to work outside these existing networks.

Initiatives can overcome these challenges by focusing on common ground with potential partners

Notwithstanding these difficulties, there are many successful examples where multilateral initiatives have found ways to work together. In some instances, the alignment has been close enough to enable the formation of full Joint Tasks where a single project is organised and authorised within two different initiatives. For example, the Energy Storage and Heat Pumping Technologies (HPT) TCPs have developed a fully Joint Task to develop a “Comfort and Climate Box” (see Box below). This worked in this case largely due to the close alignment of approach between the two TCPs – both use a 3-4 year Task structure, both appoint an

Operating Agent to manage a Task, and both formalise the terms of the Task under an Annex.

In other cases, differences in legal structure may preclude the formation of fully joint activities. In these instances, the first step in resolving a structural mismatch or legal obstacle is to seek the areas of commonality that can support collaboration without the need to develop an entirely new approach.

Collaborations often begin with information sharing, which is not generally dependent on the internal structure of the initiatives. The HEV TCP and the CEM Electric Vehicles Initiative (EVI) have a longstanding practice of exchanging information about their activities and keeping each other informed of new projects. As this information exchange is done informally, the differences in legal structure have not posed an issue. The “Comfort and Climate Box” represents another example, where MI’s Innovation Challenge 7 was able to contribute to the early development activities of a Task, even though it operated under a different legal structure than its partner initiatives (see Box below).

Common membership can also form a basis for successful collaboration. Some initiatives noted that administrative approvals within government can cause time delays and undermine fruitful collaboration. Where countries are members of multiple initiatives, their governments will already be familiar with them, which can streamline approval processes. The HEV TCP noted that collaboration has been easier with CEM EVI in some cases due to the fact that some countries have nominated the same representatives to both initiatives.

Case study: Multilateral initiatives working together despite structural and legal differences to launch the “Comfort and Climate Box”

The Energy Storage TCP, the HPT TCP and MI’s Innovation Challenge 7 (IC7) on affordable heating and cooling of buildings co-developed the Comfort and Climate Box to accelerate the market development of smart integrated heating, cooling and energy storage. The goal is to develop nearly market-ready systems, starting with a heat pump and a storage system.

All three initiatives contributed actively to the initial development of the project, with preliminary definition work carried out at a workshop in 2017 organised by MI IC7. Later work activity has been primarily carried out by the two TCPs and endorsed by IC7. The project is organised as a limited-duration collaboration supported by in-kind contributions from participants. The work is jointly led by both TCPs and

includes five work packages on market status, prototyping, testing, roadmap and organisation. The organisation of the project was greatly facilitated by the appointment of a single Operating Agent with experience of organising TCP projects.

The two TCPs normally have different project structures for funding the Operating Agent, with the HPT TCP operating under a cost-shared model and the Energy Storage TCP operating under a task-shared model. The Comfort and Climate Box has been set up following the HPT model, with one of the countries participating in the two TCPs providing funding to support the Operating Agent. This flexibility has allowed the Energy Storage TCP participants to join this activity despite the difference in legal structure.

A joint follow-up annex, the Comfort and Climate Box Solutions for Warm and Humid Countries, is currently under development.

Flexibility is key to developing joint activities

To optimise collaboration, the TCPs and other initiatives can adopt flexible approaches to project development that tailor a specific project so it aligns with the structures of different initiatives. The TCPs that are open to developing projects that do not function in the way their typical projects do are more likely to find common ground with other initiatives.

Often a single initiative takes the leading role. This may be the initial proponent of the project, or it may be the one with the most resources available. If other participants can adopt a flexible approach, then the fastest and simplest way forward may be to adopt the approach of the “lead” and have other participants align as best as possible.

Hybrid funding models can provide flexibility. As noted above, most multilateral initiatives have adapted either an in-kind funding model, also known as “task-sharing”, or a model based on an established fee, also known as “cost-sharing”. Some TCPs use a hybrid model that provides flexibility to use either task-sharing or cost-sharing depending on the needs of a particular project and the interest of participants. For example, the District Heating and Cooling (DHC) TCP adopted a hybrid task portfolio in order to ensure flexibility to contribute to different kinds of projects. Previously the DHC TCP operated on a purely cost-shared model, but the Executive Committee agreed to allow the possibility of task-shared activities in part to accommodate collaborative projects. This is also true of MI Communities and Missions, which may adopt in consultation with their members

different funding approaches to support proposed activities. Hybrid approaches provide flexibility that can be beneficial when pursuing joint projects with other initiatives.

Variable project timing can help to align timelines and deadlines across initiatives. A flexible approach to the timing of Tasks can increase the likelihood of finding common ground. If one initiative normally carries out projects over three years, while another initiative normally carries out single-year projects, it will be easier to come to a suitable arrangement if both parties are willing to compromise.

The MI Clean Hydrogen Mission has had success with adopting a more flexible timing model. They found that shorter projects with a limited mission and well-defined outputs functioned best, given the number of initiatives active in hydrogen. This also had the added benefit of carving out smaller spaces after identifying the gaps that exist. Accordingly, this may allow them to keep up to date and on track with other initiatives, and to regularly check in with others in the space.

Similarly, the SolarPACES TCP has created a structure that allows smaller, shorter-term projects to be carried out under an existing Task. These projects can help to align specific activities with the timing of others even while the Task continues with a defined, long-term timeframe. This allows for a wider variety of topical areas for collaboration with other TCPs or multilateral initiatives. Topical projects report to Task Managers instead of the TCP Executive Committee, which may potentially make reporting procedures easier for those leading joint projects.

Adopting flexible procedures can help to avoid obstacles and facilitate collaboration. Where initiatives have existing procedural rules to manage their activities, rigid application can cause complications when multiple initiatives are involved. Initiatives are likely to be more successful at identifying and developing joint projects if they are able to adapt procedural rules quickly.

Several TCPs recommended streamlining reporting procedures for Task Managers or Operating Agents who lead joint activities. If both TCPs insist on applying their standard procedural and reporting requirements, this may lead to the duplication of effort and complications if not strategically planned before starting the project. One approach is for each initiative to designate a separate point of contact to manage their contribution to a joint activity. Alternatively, it may be easier if the participants simply choose to follow the lead of one of the initiatives and then apply only that initiative's timelines, procedures and reporting requirements.

Case study: Users-4E TCP project on smart devices at home

The Users and Energy Efficient End-Use Equipment (4E) TCPs have developed a joint project focused on smart devices in the home. This project began with a joint workshop with participation from both TCP Executive Committees and developed into a relatively small joint activity funded in kind.

The two TCPs began by familiarising themselves with each other's methods of operating and creating a common set of shared governance processes and principles. Specifically, the project was led by two individuals who were each well versed in both TCPs' governance structures. The TCPs agreed to establish a joint Steering Committee with representation from both sides to oversee the project. This helped to avoid two separate approval processes.

The TCPs noted that the small size and short duration of the project meant that that the project was unlikely to develop a strong sense of community among the participants. Therefore, strategic efforts would be needed to create an institutional memory and a lasting institutional capacity in each of the TCPs.

4. Streamline legal mechanisms used for collaboration

Summary

- Collaborative projects remain relatively rare among the TCPs and other surveyed multilateral initiatives. Therefore, most projects have to be developed from scratch without the benefit of prior examples and experience.
- Starting from a set of common template documents for collaboration can simplify the process and save time.
- The IEA Office of Legal Counsel has collected examples of various legal documents from across the TCP network and used them to develop model templates. The TCPs are encouraged to use these templates and examples as a starting point for developing new collaborative projects.
- While these templates are primarily tailored for TCP use, they may still serve as basis for other multilateral initiatives seeking to streamline the process of collaboration.

Developing a joint task from scratch can be complicated and time-consuming

Initiatives report that even successful collaborations have had to overcome practical challenges when formalising responsibilities. Although most projects are initiated through informal exchanges, at some point a more formal relationship may be needed in order to support joint work. This step can be difficult and time-consuming, particularly as many joint projects are unique, without convenient precedents or experience to draw from.

For example, the Energy Storage TCP found the formalisation process burdensome when attempting to contribute to one of the MI Innovation Challenges. They encountered a number of practical obstacles, including various legal mismatches as discussed in Chapter 3. Ultimately, the Energy Storage TCP, the HPT TCP and MI were able to organise a Joint Task, but it required many months of negotiating and co-developing compatible options.

Some initiatives noted that there is limited information available about the legal options for collaboration. There are still relatively few examples of joint

projects among the TCPs or between TCPs and other multilateral initiatives. As a result, regardless of the nature of the collaborative work that is to be carried out, joint activities are often organised and designed from scratch without being able to draw on existing examples.

Formalising collaboration generally requires consideration of legal topics such as intellectual property rights and confidentiality of information. Given the potential for the work of multilateral initiatives to lead to commercially valuable information or products, it is important to address these concerns in advance to ensure that ownership of data and intellectual property is clear. Obtaining approval for intellectual property provisions can involve lengthy negotiations depending on the internal procedures of participants. As most participants in multilateral initiatives do not have a legal background, they typically spend a significant amount of time working through the various legal issues.

Making use of streamlined templates can simplify the formalisation process

To save time and increase efficiency for joint activities, initiatives are encouraged to use a set of standard templates that can be adapted to the need of a particular project. Relying on templates that have already been prepared and tested also allows for standardisation across the TCP network, which in turn streamlines pathways to collaboration. It allows the TCPs and potentially other multilateral initiatives to adopt a systematic approach, making the transition from informal exchanges to formalisation of collaborative duties more efficient. The IEA Office of Legal Counsel has prepared templates for certain common collaboration documents, which are available in the [TCP Guide](#) and at the links below. We hope that these templates can serve as the basis for collaboration beyond the TCP network, with possible adjustments tailored to the needs of other multilateral initiatives.

Four approaches are listed in this handbook:

- 1. Collaborative partnerships are authorised under the Framework for the Technology Collaboration Programme**, approved by the IEA Governing Board in April 2020. The framework encourages TCPs to collaborate with multilateral initiatives with a particular focus on subjects that touch on the work of multiple TCPs. Following approval of the framework, the IEA Office of Legal Counsel has developed template [language to authorise TCPs to enter into partnerships](#) or other arrangements with other multilateral initiatives. A standardised partnerships provision common to all TCPs will help ensure that the TCPs are starting from the same basic legal setting.

- 2. Joint Tasks or Annexes are the most common mechanism that TCPs use to work collaboratively with other TCPs.** For collaborative projects involving multiple TCPs, the simplest approach may be to design and initiate Joint Tasks as a means of collaborating on a chosen topic. Most TCPs organise their work by carrying out a series of Tasks, each underpinned by a legally binding Annex. This approach may be particularly useful if both TCPs use a similar Task structure, but it could also be useful even where the Task structure diverges, provided that both TCPs have a flexible approach that can accommodate a Joint Task. There are [multiple examples of Joint Annexes across the TCP network](#), and the IEA Office of Legal Counsel has prepared a template based on these examples.
- 3. A Letter of Participation can set out the obligations and responsibilities of specific experts participating in joint work.** Short of developing a fully Joint Task, it may be simpler to invite experts from a different initiative to participate in an ongoing Task. In this instance, a single initiative is fully responsible for the project, but the participants still get the benefit of participation from experts from other initiatives. This generally begins on an informal basis, where members of one initiative attend technical meetings of a TCP and provide input. If desired, participation in a TCP Task may be formalised through signing a [Letter of Participation](#), a template of which is available on the TCP Guide. The extent of participation, including any obligations and responsibilities, can be outlined in this letter.
- 4. Memoranda of understanding can be particularly useful for collaborations involving a TCP and another type of initiative.** Projects involving initiatives from different networks may be particularly complex. The TCPs are each established according to a legally binding Implementing Agreement, whereas many other multilateral initiatives do not have a legally binding agreement. In these instances, a [memorandum of understanding](#) (MoU) may be the best approach, as they are usually non-binding and as a result are very flexible. Templates and samples are available in the TCP Guide.

Case study: Joint Annex on solar resource for high penetration and large scale applications

The PVPS TCP and the SolarPACES TCP developed a Joint Task to accelerate the penetration of solar technologies and improve markets for these technologies. The Task aims to lower barriers to and the cost of grid integration of PV, and reduce planning and investment costs for PV by enhancing the quality of forecasts and resource assessments. The SHC TCP also contributes to the Task through designation of national experts.

The activities of the Task are described in a Joint Annex, agreed by both PVPS and SolarPACES. It sets out the overarching objective of the Task as well as more

specific goals. This is followed by an in-depth description of the individual sub-tasks and the activities within them.

The Joint Annex also details the specific operating procedures for the Joint Task. This includes details for the Task Operating Agents – currently one representing each TCP – and their responsibilities. Lastly, the Joint Annex prescribes details for the time schedule of the Joint Task, its funding and a list of country participants that will be represented by the TCPs.

Case study: Setting up an MoU between the Hydrogen TCP and the International Atomic Energy Agency

The Hydrogen TCP has entered into an MoU to collaborate with several other multilateral initiatives. A notable example is a proposed MoU with the International Atomic Energy Agency (IAEA).

The primary purpose of the MoU is to define the agreed scope of co-operation to provide an institutionalised record of the parties' intentions. Having this in writing enhances clarity compared to purely informal arrangements and ensures that expectations are clear from the start. The Hydrogen TCP-IAEA MoU provides that the two organisations can organise joint activities, develop joint reports, organise workshops or events, and will invite representatives to attend meetings as observers.

The MoU includes several standard provisions to facilitate carrying out the agreed scope, including designating points of contact, confirming the independence of the parties, setting expectations for the use of names and logos, and setting expectations for the dissemination of information, intellectual property and settlement of disputes.

These templates were developed from existing examples drawn from across the TCP network. The TCPs that have developed collaborative arrangements are encouraged to share these examples with others so they can benefit from this experience. Similarly, other multilateral initiatives and platforms experienced in the formalisation of collaboration are invited to share lessons learnt and templates used, with a view to enhancing global knowledge in this space. The IEA Office of Legal Counsel has collected several examples in the [TCP Guide](#), which is updated regularly.

5. Consider the existing landscape before developing new initiatives

Summary

- Before proposing new initiatives, proponents should thoroughly map the existing landscape of multilateral initiatives and assess the need. This process can help reveal possible gaps in global efforts, strengthen the value proposition of new initiatives and increase buy-in from potential members.
- To ensure new initiatives complement existing ones, proponents should focus on their specific value added, their fit into the existing ecosystem and how collaboration will take place using established processes. Expanding existing initiatives instead of creating new ones should also be considered.
- When a new initiative is proposed, it often overlaps to an extent with existing ones, especially in technology areas where these have multiplied in recent years (e.g. hydrogen, bioenergy). This creates opportunities to explore synergies and avoid duplication.

Whenever a new initiative is introduced, there is an opportunity to explore synergies

As the number of multilateral initiatives for energy technology development has proliferated in recent years, there are often [questions](#) about whether new partnerships are needed. For example, when multiple partnerships are already active in a particular technology area – such as for hydrogen, bioenergy or solar PV – putting forward new ones creates the [potential for duplication](#).

Some degree of overlap between multilateral partnerships can be desirable, for example when they share common goals, put in place systematic processes to explore collaborative opportunities and carry out complementary activities. Too much overlap, however, can trigger confusion about respective mandates and value added, dilute the efforts and visibility of each initiative, and lead to the fragmentation of resources. In turn, this can be detrimental to the effectiveness of global collaboration and the optimal allocation of budgets.

Overlap may materialise in different ways, such as when multilateral partnerships share common core characteristics, such as:

1. **Mandate:** overlap in the overarching purpose or specific objectives set out by each partnership – which generally influences other core characteristics.
2. **Focus area:** overlap in the energy technologies, components, products or services, or segments in the value chain the partnerships focus on.
3. **Membership base:** overlap in member or participating countries and regions, and/or of geographical area of focus.
4. **Membership type:** overlap in the types of institutions or individuals taking part in the partnership, such as: public research institutes and universities; private-sector and industry actors; financiers or development institutions; public administrators and policy makers; or ministers and politicians.
5. **Activity type:** overlap in the types of underlying activities and their objective, such as: sharing information about new technology concepts; carrying out collaborative RD&D projects; examining technology, policy or market trends; formulating policy recommendations for technology development and market uptake; and opening funding opportunities.
6. **Audience:** overlap in the target audience of the partnerships' outputs.

There is no rule of thumb to assess whether two given partnerships – whether already in operation or under consideration for a new launch – feature a healthy degree of overlap or face the risk of duplication, and a case-by-case analysis is necessary. The outcome of such assessment may also evolve over time as activities within partnerships change and priorities are adjusted. It is also possible that two multilateral partnerships overlap only partially, but remain complementary in other ways, which would in turn open possible avenues for working together.

When putting forward ideas for new multilateral partnerships or initiatives, governments should carefully assess the degree of overlap with the existing landscape. The above list of core characteristics provides the basis for a template to compare existing and new initiatives. It is likely to be worthwhile regularly reviewing current participation to inform future membership decisions and potentially save time and resources when putting forward new initiatives.

A comprehensive map of the landscape of existing initiatives can reveal possible gaps

Proponents should undertake a comprehensive mapping exercise when considering a new initiative to understand how it would fit into the existing structure of international partnerships and collaborations. Such a review can help identify gaps in the global energy technology ecosystem – such as sectors or technology areas that do not currently benefit as much from international focus despite pressing [innovation needs](#) to meet net zero ambitions – and assess whether such

gap may be filled by a new initiative. The exercise can accelerate the process of designing new joint activities and allow the draft proposal to cover the tangible value proposition relative to existing activities and any possible synergies.

A thorough mapping exercise would typically involve the following steps:

- 1. List all major multilateral partnerships currently active** in the same technology area, as well as in related fields and sectors.
- 2. Review their core characteristics**, including: mandate, focus area, membership base and type, type of activities and outputs, and audience.
- 3. Examine the list of recent and ongoing activities** under each major partnership, contributions by various participating organisations, key outputs and their impact on the target audience.
- 4. Establish contact points** in existing partnerships and ask about the state of current activities and future projects already in the pipeline.
- 5. Explore the history of discontinued partnerships** that may have once been active in the same technology area, examining key outputs, lessons learnt and assessing reasons why they were discontinued.
- 6. Identify possible gaps in the current ecosystem** based on the information collected in the previous steps, and incorporate these findings in the proposal documents for new initiatives.

In many cases, proponents of a new initiative are already familiar with the major players in their specific technology area. This provides an opportunity to set up a mapping exercise and engage with the leading institutions of existing partnerships more quickly, and to include the resulting assessment in draft proposal documents. Even for experienced practitioners, a mapping exercise will yield new insights, particularly if it involves an in-depth comparison of the work programmes, activities and outputs of different initiatives.

In 2019 ETIP SNET published an [in-depth analysis and mapping](#) of European and global initiatives active in selected technology areas for the energy transition. The authors identified possible gaps in the global innovation ecosystem and avenues for collaboration between existing multilateral platforms, in a call for more joint work to pursue synergies and seek complementarities – including between European initiatives, the TCPs, the CEM and MI.

A mapping exercise may be particularly fruitful if it is paired with meaningful outreach to initiatives that are already collaborating, as those already working in the field may be best placed to know where gaps might exist. Multilateral initiatives stand to benefit from the mapping if proponents of new activities bring external views and fresh thinking. This will also provide an opportunity to discuss the

proposed work plan for the new activity with peer organisations to determine where they might be overlap and, in particular, whether there is mileage in collaborating.

While a thorough mapping exercise may require time and resources, it is critical to ensure new joint activities will add value, fit into the existing ecosystem and appeal to potential members and funders. Ultimately, the depth of the exercise depends on the number of existing initiatives and how well proponents know the field.

In some cases, it may turn out from the mapping exercise that forming an entirely new initiative is not needed, for example given the number of existing initiatives that are already in place and their collective scope and impact. In these cases, it may be more productive to either expand the mandate, scope and activities of an existing partnership or to host a new activity within an existing initiative to take advantage of existing efficiencies. Even if creating a new initiative may eventually be the preferred way forward, the option of expansion should be discussed openly with current member or participating countries as due diligence. Over time, as a project grows, it may ultimately be spun off into a standalone initiative if interest develops. This was the approach followed for the proposed Decarbonisation of Cities and Communities TCP, which originally started as a working group of the Energy in Buildings and Communities TCP before participants decided to launch it as new TCP (see Box 12), and for the Energy Efficiency Hub, which was established as a follow-up on International Partnership for Energy Efficiency Cooperation (IPEEC) and hosted with the IEA to take advantage of existing synergies.

Case study: Decarbonisation of Cities and Communities TCP

The creation of the new Decarbonisation of Cities and Communities (Cities) TCP is an example of a bottom-up approach taken for the establishment of a new initiative. The proponents of the new TCP established a working group made up of a diverse set of technical experts and policy makers from relevant governments to discuss next steps after the completion of a Task in the EBC TCP. The need to establish a forum to engage city governments was identified to address the outstanding research questions from the previous Task.

The development of the new TCP required a comprehensive mapping of the current TCP landscape to seek synergies with other initiatives and avoid duplication. The working group helped to facilitate this mapping, identify innovation gaps and narrow down the possible niche for the new TCP. This working group

was made up of representatives from a range of TCPs, including the EBC, DHC, SHC, and Energy Storage TCPs. The proponents also invited delegates from the IEA End-Use Working Party to better understand how the new initiative would fit within the TCP network. The Cities TCP developed its proposed programme of work based on these discussions and an examination of ongoing and completed Tasks of relevant TCPs.

Involving a range of relevant TCPs when developing the Cities TCP's proposed work plan had a range of benefits. Most significantly, it confirmed that there was a need for a forum to facilitate engagement between topically focused innovation initiatives and city governments. It also provided a comprehensive guide to the TCP activities that could form the basis of future collaboration between the Cities TCP and other TCPs. The Cities TCP also found it helpful to discuss the various operational and logistical challenges they may face after the TCP is established, and to exchange insights on possible solutions. This was particularly useful when deciding how to set membership costs and other financial policies for the new TCP.

Additionally, the Cities TCP working group helped to spread the word among potentially interested countries. The working group included a range of experts from various backgrounds and member countries, and participating in the working group helped to build the case for the new TCP within these countries.

Focusing on the added value of new initiatives helps position them in the existing institutional landscape

Proposals for new multilateral initiatives – or activities within them – often already include new dimensions or aspects that are not being considered by the existing landscape. Focusing on such differentiation and making the case for the specific value added of the proposed new activities can increase the chances of successful buy-in from potential members, who are typically most interested in new initiatives tackling potentially overlooked topics and may otherwise push back against the need for new initiatives. Showing complementarity and identifying tangible avenues for collaboration is also important to appeal to existing initiatives, which may otherwise be reluctant to engage down the road and even less so to relinquish control over their programme of work in case of overlap.

For example, a new initiative may:

1. **Seek broader or complementary membership**, such as from countries or regions of the world that currently do not fully participate in existing partnerships.

2. **Approach new types of institutions** that may be underrepresented in the existing landscape, such as private industry actors if current initiatives mostly gather public research institutes, or scientific institutes if current initiatives are mostly active at the political level.
3. **Focus on new strategic areas** such as energy sectors or technology concepts, components or segments of the value chain that are currently not covered by existing initiatives.
4. **Put forward new types of activities** that do not yet exist or are limited in scope in existing partnerships, such as proposing collaborative RD&D activities if current initiatives focus on economic and policy trends analysis.

The challenge for proponents of new initiatives should be to determine the best institutional position for the new initiative, what it adds to the landscape and how it will seek to pursue synergies with existing initiatives. As part of this process, it may be worth systematically exploring the possibility of expanding the scope of existing initiatives instead of creating new ones, even if only as a comparative scenario.

Case study: Aligning proposals for new initiatives with the existing institutional landscape in the second phase of MI

In 2021 MI entered its second phase (2021-2030) and launched several [new Missions](#), as explained in an earlier case study in this report. As part of the design process for new activities, proponents were requested to examine the existing institutional landscape, clarify the specific value added of new activities and adjust their scope so that they complement existing efforts.

The process involved three main stages:

- **Selecting Mission topics.** In 2020 the MI Secretariat carried out technical and political analysis to identify an initial list of potential mission topics. This exercise was based on inputs from MI members, feedback from the ICs in the first phase of MI, and a survey of collaborating organisations. This early stage in the process already involved identifying existing and active multilateral platforms and establishing contacts with key actors for potential collaboration down the road.
- **Scoping Mission proposals.** In 2020-2021 MI members fleshed out the initial concept of Missions (e.g. goal, challenges, commitments, tentative activities, potential partners to build a coalition) and consulted with partners and other multilateral initiatives through several rounds of written feedback and virtual workshops. An independent assessment group, including stakeholders from

other international organisations and initiatives, provided tailored feedback to Mission proponents, notably to ensure alignment with other initiatives.

- **Launching Missions.** In 2021 MI launched several Missions after MI members demonstrated political commitment to lead or participate in them and concluded that significant efforts had been made to ensure new activities added value given the existing landscape. Each Mission is led by two to five MI members working with a “Core Group” of governments and private-sector organisations, and assisted by a “Support Group”, which includes other willing governments, multilateral initiatives, international organisations and corporate alliances.

While the concrete activities of the Missions are not fully fleshed out yet, this process has helped proponents pave the way for effective co-ordination with existing initiatives and strengthen the value proposition for new activities, hence decreasing the risk of duplication. Ultimately, this was also central to securing buy-in from potential member countries and other key actors involved in existing multilateral platforms.

6. Adopt a whole-of-government approach to collaboration

Summary

- Governments have a leading role to play in ensuring that multilateral initiatives, both existing and new, are complementary and collaborate. In many instances, however, they are represented by different institutions, which can hinder collaboration.
- Putting in place robust co-ordination processes in a whole-of-government approach to international collaboration can help rationalise national participation and avoid overcrowding of new initiatives.

Governments are central to the success of international collaboration efforts

Governments have a unique and leading role to play in international collaboration on energy technology development and innovation. While major leaps forward in energy technology development are often achieved locally, including by companies, governments can connect national efforts with international action through multilateral platforms to increase their impact (e.g. international standards for global supply chains and sales). Governments are the primary membership base and audience for most existing and active multilateral initiatives today. Member or participating countries, usually through their government or an institution designated to represent them, are the main proponents of new multilateral initiatives. Governments are responsible for the good functioning of the multilateral platforms they are involved in, as well as for ensuring they are complementary and collaborate well.

In most cases, however, different ministries or public institutions are in charge of representing their country in multilateral initiatives, as responsibilities for energy, the environment, climate, and science and technology policy are often spread across different branches of government. Different ministries or publicly led institutions or state-directed companies may have different incentives to represent their country in the international ecosystem, possibly reflecting their specific interests. On one hand, this can trigger healthy internal competition, for example

if different teams are regularly prompted to put forward proposals for the country's multilateral participation and if these are subsequently compared through a transparent and inclusive process. However, on the other hand, competing interests and mandates can lead to limited collaboration in practice, inefficient participation at the national level and overcrowding of initiatives at the international level, for example if different branches of government each have an incentive to propose initiatives they would lead irrespective of existing national commitments.

A co-ordinated, whole-of-government approach can help save resources and foster collaboration

There is an opportunity for countries to put in place a co-ordinated, whole-of-government approach to international collaboration. Such a strategy would essentially have three core goals:

- 1. Ensure full alignment between participation and national priorities** given key energy and climate policy goals, including through regular reviews of current participation, thorough assessment of proposals for new initiatives and contributions to shape the work programme of existing multilateral partnerships.
- 2. Co-ordinate national participation in different partnerships** by building systematic inter-ministerial collaboration and information sharing processes that are robust in the face of changes in administration and personnel.
- 3. Establish a clearly identified one-stop shop for new initiatives** within the government that proponents can refer to and make contact with, which would potentially provide guidance on current participation and the decision-making processes for new participation, and offer support for a thorough exercise to map the existing landscape to avoid the risk of duplication.

Case study: UK national co-ordination team

The UK Department for Business, Energy & Industrial Strategy (BEIS) has adopted a co-ordinated approach to managing its participation in TCPs. BEIS conducts a competitive tendering process to select technical experts to support the government's primary delegate on each TCP. The technical experts act as alternative delegates to each TCP; disseminate findings to UK industry and researchers; represent the United Kingdom's interests in the management and development of the TCP's activities; and work as a team to avoid duplication and increase value to the United Kingdom across TCPs.

The technical experts establish and co-ordinate networks of interested industry representatives and researchers to whom findings can be disseminated and who can be quickly consulted in response to calls for new work within the TCP. When

new Tasks are formed within TCPs, these TCP national teams can be used to identify relevant national experts for participation. In addition, members of this network can propose new Tasks to the TCP primary delegate for consideration by the TCP Executive Committee.

While this approach has primarily been used to facilitate a more co-ordinated approach to participation in a single initiative, it can also be used at the higher level by putting together a “national team” that brings together several representatives who, collectively, cover a broad range of the landscape of multilateral initiatives the country is involved in. This can facilitate sharing of good practice approaches and exchange of ideas across initiatives, and help to identify avenues for collaboration.

A co-ordinated approach can help mitigate risks associated with competing interests and the lack of awareness of projects led by others, increase chances of being represented in each partnership by the best-placed national institution (see Box “Case study: UK national co-ordination team” on the United Kingdom’s approach to co-ordinating TCP activities and selecting national experts), and avoid the fragmentation of budgets for international collaboration across too many initiatives. This can be valuable not only to ensure that new proposals for multilateral initiatives are fully relevant within the existing ecosystem, but also to enhance co-operation between existing initiatives by influencing decisions at the partnership level when the country is a member.

The strategy could entail setting up a dedicated co-ordinating unit with a horizontal structure cutting through different branches of government and a mandate to inform high-level decision-making for current and new participation in multilateral partnerships (see Box below). Governments could also organise annual “universal meeting” days, gathering all major actors involved in multilateral partnerships across the energy sector at the domestic level, with a specific view to fostering collaboration between them and identifying pressing gaps in the national and international ecosystems that may be filled by new initiatives.

Case study: National cross-initiative co-ordination days

Some governments of countries that participate in many different multilateral initiatives for energy innovation organise national co-ordination days for their representatives. These typically consist of a day-long workshop bringing together people from across different sectors or technology areas and government departments.

Often, representatives in different initiatives work in different divisions or even different agencies, and thus may not have regular opportunities for exchange. A co-ordination day provides the opportunity to build a network of representatives who can then share good practice approaches on organisational and structural details, as well as discuss opportunities for collaboration.

Many governments have organised such national co-ordination days for TCP representatives, including Austria, China, Denmark, Italy, Norway and Switzerland. The IEA Secretariat also routinely participates in these events. So far, these national co-ordination days have been mostly limited to national representatives on TCPs, but there are opportunities to include representatives from other initiatives as well.

Annex

Abbreviations and acronyms

4E TCP	Energy Efficient End-Use Equipment TCP
AFC TCP	Advanced Fuel Cells TCP
AMF TCP	Advanced Motor Fuels TCP
AMT TCP	Advanced Materials for Transportation TCP
BEIS	Department for Business, Energy & Industrial Strategy
C3E TCP	Clean Energy Education and Empowerment TCP
CEM	Clean Energy Ministerial
CHM	Clean Hydrogen Mission (MI)
Cities	Decarbonisation of Cities and Communities TCP
CTP TCP	Tokamak Programmes TCP
DHC TCP	District Heating and Cooling TCP
EBC TCP	Energy in Buildings and Communities TCP
ETIP	European Technology and Innovation Platform
EVI	Electric Vehicles Initiative
H2I	Hydrogen Initiative (CEM)
HEV TCP	Hybrid and Electric Vehicles TCP
HPT TCP	Heat Pumping Technologies TCP
IAEA	International Atomic Energy Agency
IC	Innovation Challenge
IEA	International Energy Agency
IPHE	International Partnership for Hydrogen and Fuel Cells in the Economy
IRENA	International Renewable Energy Agency
ISGAN TCP	International Smart Grid Network TCP
MI	Mission Innovation
MoU	memorandum of understanding
PVPS TCP	Photovoltaic Power Systems TCP
RD&D	research, development and demonstration
SHC TCP	Solar Heating and Cooling TCP
SNET	Smart Networks for Energy Transition
SolarPACES TCP	Solar Power and Chemical Energy Systems TCP
TCP	Technology Collaboration Programme
Users TCP	User-Centred Energy Systems TCP
WEF	World Economic Forum
Wind TCP	Wind Energy Systems TCP



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