

H2020 Partnership Landscape and its relevance for Horizon Europe – Cluster ‘Climate, Energy and Mobility’

Description and Analysis

Information

Project no.	811171
Project acronym	ERA-LEARN
Project full title	Strengthening partnership programmes in Europe
Funding scheme	CSA
Start date of project	1. July 2018
Duration	48 months
Background	<p>The description and analysis of networks follow the recommendation of the ERAC ad hoc Working Group on Partnerships to provide an analysis on the status-quo of partnerships in prospective areas of Horizon Europe. The individual Cluster Reports will inform a Synthesis Report which is based on the partnership analyses that have been performed in relation to the clusters under Pillar II “Global Challenges and Industrial Competitiveness” of Horizon Europe (Commission proposal).</p>

Disclaimer

The Cluster Reports were elaborated by ERA-LEARN to support the coordination and cooperation among networks. They are work in progress and should be seen as a basis for starting discussions among the networks about the potential to adjust and streamline the partnership landscape in view of the challenges addressed by Horizon Europe. They are based on:

- a listing of networks provided by DG RTD, reviewed and partly modified by ERA-LEARN experts
- the ERA-LEARN database and
- desktop research and professional background knowledge of the ERA-LEARN authors of the individual Cluster Reports.

While due diligence was applied there are certain limitations that readers should bear in mind:

- The papers display and discuss existing partnerships, serving current framework priorities, and apply educated guesses about their relevance for the thematic clusters and (groups of) intervention areas sketched for Horizon Europe. They do not take into account the gradual thematic flexibility of networks or parts thereof, or the changes of research priorities that national ministries and funding initiatives may undertake. Nor do they consider the invaluable capacity of ministries to design and implement MS-based transnational funding initiatives across Europe across all innovation phases and aspects, and beyond their mere match with future thematic intervention areas of the clusters under Pillar II “Global Challenges and Industrial Competitiveness” of Horizon Europe (Commission proposal).
- The clustering of intervention areas to sub-clusters has been determined by the authors by means of expert assessment, for greater clarity of the connections displayed.
- The displayed connections are limited to formal connections and existing collaborations among partnerships.

Taking these limitations into account the parties involved in creating the databases and drafting the Cluster Reports would like to emphasize that references to networks and/or their relevance and/or their connections are not meant to be exhaustive nor judgemental but a preliminary input to the discussion process on the rationalisation and reform of the partnership landscape.

Background

This report is part of a series of reports addressing the five suggested Clusters of Horizon Europe (EC Proposal from June 2018). General information about the scope and methodology applied as well as on the description of the network types, etc. is provided in the so-called “Synthesis Report” to avoid duplication. All reports focus on R&I related partnerships in the areas suggested for Horizon Europe. Other networks are not considered. The Synthesis Report also includes the definition of the different partnership types that are considered in the individual reports.

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1. Overview of Cluster, Actors and Activities

1.1. Overview

A: Description of Cluster

Within the Commission proposal for Horizon Europe, the Cluster '**Climate, Energy and Mobility**' is aimed at addressing, in a highly integrated and effective way, one of the most important global challenges for the sustainability and future of our environment and way of life. To meet the objectives of the Paris Agreement the EU will need to transition to a low-carbon, resource-efficient and resilient economy and society. Limiting the increase of global average temperature to well below 2°C, and pursuing efforts to limit the temperature increase to 1.5°C, requires rapid progress in decarbonising the energy system and substantially reducing greenhouse-gas (GHG) emissions from the transport sector.

The cluster has a proposed budget of 15 000 million € as provided in the proposal of the European Commission on Horizon Europe¹ and builds on three of the Horizon 2020 Societal challenges:

- Secure, clean and efficient energy (5 931m € budget);
- Smart, green and integrated transport (6 339m € budget); and
- Climate action, environment, resource efficiency and raw materials (3 081m € budget)

Of course some aspects of the last of these are more aligned with one of the other Clusters (i.e. Food and Natural Resources).

For Horizon Europe, nine broad areas of intervention have been proposed by the European Commission², for structuring the work programme in this cluster. Within these nine intervention areas, a number of broad lines of activity have also been proposed as summarised in Table 1 below.

¹ https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-horizon-europe-regulation_en.pdf (p.32)

² https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-horizon-europe-decision-annexes_en.pdf

Table 1: Intervention areas and relevant sub-topics of the Cluster ‘Climate, Energy and Mobility’ in Horizon Europe

Relevant Sub-Topics	Intervention Areas								
	Climate Science and Solutions	Energy Supply	Energy Systems and Grids	Buildings and Industrial Facilities in Energy Transition	Communities and Cities	Industrial Competitiveness in Transport	Clean Transport and Mobility	Smart Mobility	Energy Storage
	Knowledge base on the earth-climate system	Renewable energy technologies and solutions	Technologies and tools for electricity networks	Electricity and heat between plant and system operator	City/district/mobility systems	Merging of physical and digital design, etc.	Electrification of all transport modes	Digital network and traffic management	Technologies including liquid and gaseous renewable fuels
	Decarbonisation pathways, mitigation actions and policies	Disruptive renewable energy technologies	Pan-European energy network approaches	Tools and infrastructure for process control	Urban planning, infrastructure and systems	Vehicle/vessel/aircraft concepts and design	Sustainable new fuels and new smart vehicles, vessels and aircraft	Single European Sky	Batteries and EU value chain
	Climate projections and techniques for predictability	Technologies and solutions to reduce GHG emissions	Integrated approaches at local level	Relevant processes, design and materials	Quality of life for the citizens, safe mobility, etc.	On-board technologies and sub-systems	Reducing the impact of mobility	Rail technologies and operations	Low zero-carbon hydrogen including fuel cells
	Adaption pathways and policies		Network flexibility and synergies	Smart buildings and large mobility hubs	Global cities research agenda	New materials, techniques and methods		Connected cooperative and automated mobility systems and services	
				Buildings life-cycle design, construction, operation and dismantling		Infrastructure maintenance, regeneration and upgrading			
				New business models, approaches and services					
				Energy Performance modelling; Tools and smart appliances; and Renovation processes of existing buildings					

Source: COM(2018) 436 final Annexes: https://eur-lex.europa.eu/resource.html?uri=cellar:7cc790e8-6a33-11e8-9483-01aa75ed71a1.0002.01/DOC_2&format=DOC

B: Description of partnerships programmes related to the intervention areas

The Cluster 'Climate, Energy and Mobility' clearly has three distinct thematic areas but there is also a cross-cutting area (communities and cities), which spans all three. It should also be noted that there is synergy with some elements of other Clusters. For example:

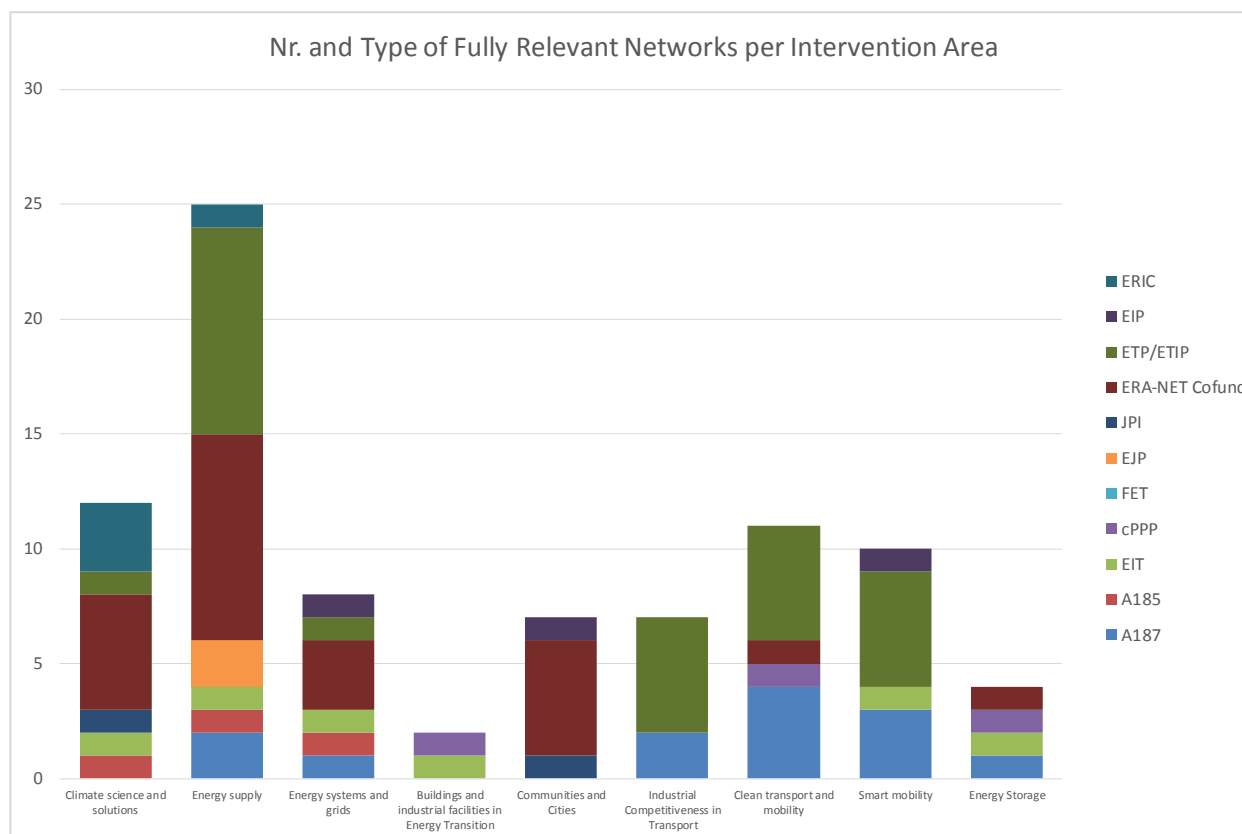
- The 'Health' Cluster has an area of intervention on 'Environmental and Social Health Determinants'
- The 'Digital & Industry' Cluster has an intervention area on 'Low-Carbon and Clean Industries'
- The 'Food and Natural Resources' Cluster has an intervention area on 'Environmental Observation' and there are also some synergies amongst the broad lines of other intervention areas (e.g. nature-based solutions to climate change, carbon sinks, etc.)

The various networks and partnerships that are considered to be either fully or partly relevant to this Cluster are summarised in Section 3 (Appendix). Those that appear to be fully relevant include:

- 26 public-public partnerships (P2Ps) including 21 ERA-NET Cofunds, two JPIs (Climate and Urban Europe, two EJP Cofunds (CONCERT and EUROfusion) and one Art. 185 (EMPIR)
- Seven public-private partnerships (cPPPs and Art. 187)
- Three EIT-KICs
- One European Innovation Partnership
- Three ERICs
- 15 European Technology Platforms (ETP) or European Technology and Innovation Platforms (ETIP)

The distribution of these for each of the intervention areas is shown in Figure 1 below.

Figure 1: Number of current networks that are considered fully relevant for Cluster 'Climate, Energy and Mobility'³



Source: ERA-LEARN

Please note:

- We consider initiatives as fully relevant if the initiative and its research and innovation programme and/or activities deals with the thematic content of the specific intervention area to a large extent. For example, the Article 185 on Metrology (EMPIR) has thematic calls in several areas including energy and environment so is therefore considered to be fully relevant for the intervention areas 'climate science/solutions', 'energy supply' and 'energy systems/grids'.
- We consider initiatives as partly relevant, if certain parts of the research and innovation programme and/or activities of a partnership initiative are relevant for the intervention area. For example, the JPI Water has some synergy with the climate

³ A specific note is pertinent here. Some ERA-NET Cofund Actions may be serving the needs of JPIs or FET Flagships in terms of implementing the joint calls and possibly other joint activities. In these cases the ERA-NET Cofunds can be regarded as integral parts of the wider initiatives (the respective JPIs or FET Flagships). However, they are considered as individual partnerships as they consist of separate H2020 contracts with their own scope, objectives, timeline and expected impacts. More details in section C below.

change and so it is deemed to be partly relevant for the intervention area 'climate science/solutions'.

- A network can also be partly relevant to a specific area of intervention in case the focus of the network serves as the application area for the respective technologies or services to be developed in the intervention area. For instance, the Article 185 on active and assisted living (AAL 2) is partly relevant to the intervention area of 'communities & cities'. In a similar way, the EIT-KIC InnoEnergy is partly relevant for the area 'clean transport/mobility'.

The graph excludes those partnerships that are considered to be only partly relevant including two JPIs (FACCE, Water), two Article 185 Initiatives (AAL2, PRIMA) and several EIPs (active and healthy aging, raw materials, water) as well as those ERA-NET Cofunds that are in the 2018/19 work programme but not yet decided. It should be noted, however, that it includes multiples of the same partnership where it was deemed to be cross-cutting (e.g. ECSEL, the EIP for smart cities and communities and JPI Urban Europe).

There are clearly a relatively large number of networks and partnerships that are relevant to the 'Energy Supply' intervention area. This is dominated by Cofunds, including two of the newer EJP Cofunds (CONCERT and EUROfusion), and also the portfolio of ETIPs that are organised under the framework of the SET-Plan. This is discussed further below.

None of the FET Flagships are relevant to this Cluster but the 2018 work programme for Horizon 2020 indicates a call for proposals on 'Preparatory Actions for new FET Flagships' (FETFLAG-01-2018) in three areas including energy, environment and climate change.

In addition, the following ERA-NET Cofund Actions are included in the 2018-2020 work programme but not yet selected:

- MG-4-6-2019: Supporting Joint Actions on sustainable urban accessibility and connectivity
- SC5-21-2019-2020: Climate action, environment, resource efficiency and raw materials
- LC-SFS-20-2019 Building a low-carbon, climate resistant future
- SFS-31-2019: ERANETs in agri-food
- LC-SC3-ES-9-2019: Enhanced cooperation in digitalisation of energy systems and networks
- LC-CLA-09-2019: Biodiversity and climate change

Table 2 below provides an overview of all networks/partnerships that were considered to be fully or partly relevant to each of the nine intervention area and the distribution between P2P and the other partnerships.

Table 2: Intervention areas of the ‘Climate, Energy and Mobility’ Cluster and number of relevant ongoing networks (a partnership/network may be relevant to a number of different intervention areas)

<i>Intervention areas in Horizon Europe</i>	<i>Fully relevant</i>	<i>Partially relevant</i>	<i>P2P</i>	<i>PPP</i>
Climate Science and Solutions	12	17	14	15
Energy Supply	25	8	18	15
Energy Systems and Grids	7	5	6	6
Buildings and Industrial Facilities in Energy Transition	2	7	3	6
Communities and Cities	7	6	8	5
Industrial Competitiveness in Transport	7	5	1	11
Clean Transport and Mobility	11	5	4	12
Smart Mobility	10	4	4	10
Energy Storage	4	6	4	6

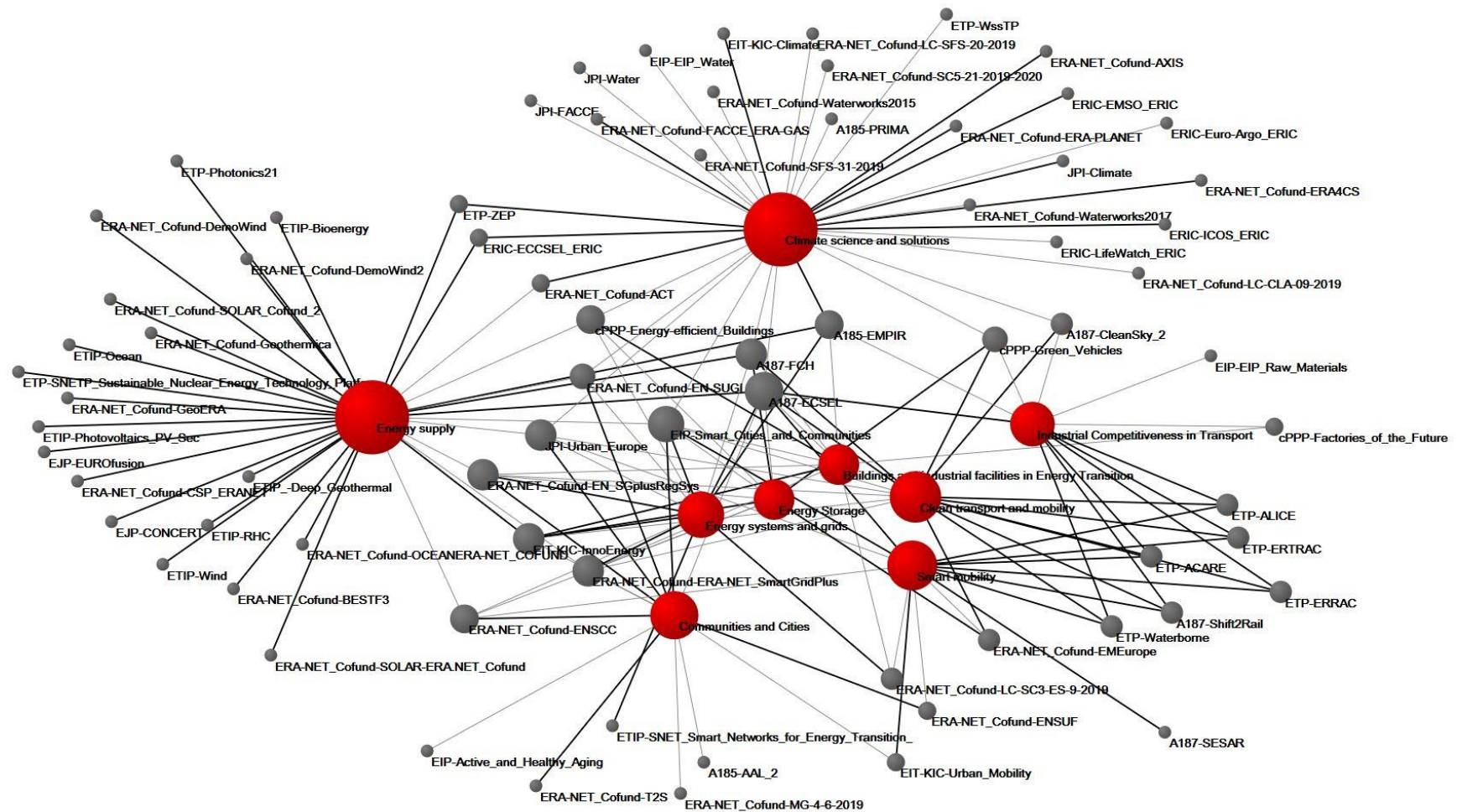
Source: ERA-LEARN

Again, the dominance in the area of ‘Energy Supply is quite obvious with 33 networks or partnerships considered to be fully or partly relevant. The other main observation is that the mobility areas are dominated by the non-P2Ps.

Figure 2 shows a network analysis of the existing H2020 partnerships that are fully or partly relevant to the intervention areas within the Cluster ‘Climate, Energy and Mobility’ in Horizon Europe. Intervention areas are red dots, networks grey ones. The connections are black lines when the network is fully relevant to the intervention area and grey if the network is only partly relevant. The more connections a dot has, i.e. the more networks are relevant (either fully or partly) to an intervention area, the larger the dot is. The algorithm places those networks/intervention areas with more connections closer to the centre. The illustration only shows how many intervention areas a specific network is relevant to. The larger grey dots indicate that the respective networks are relevant to more intervention areas than other networks. However, this cannot be considered to imply that they are in any respect more important than other networks, nor that their connections to the specific areas are in any way stronger than those of other networks.

This highlights the dominance of the sub-topics for ‘energy supply’ and ‘climate science and solutions’ based on the size of the red dots. Many of the partnerships for the latter, however, are considered to be only partly relevant. The cross-cutting partnerships such as ECSEL, EIP Smart Cities and Communities and JPI Urban Europe are also quite prominent based on the black dots.

Figure 2: Illustration of partnerships (grey spheres) related to the nine intervention areas (red spheres) of Cluster 'Climate, Energy and Mobility' in Horizon Europe



Source: ERA-LEARN

The current report considers all networks that have a separate Horizon 2020 contract. This means that even in the cases where certain ERA-NET Cofunds are implementing parts of the research and innovation programmes of other networks, such as JPIs or FET Flagships, these are considered as separate initiatives in our analysis. This is the case for the following networks in the Cluster 'Climate, Energy and Mobility':

- ENSCC, ENSUF and EN-SUGI are linked to JPI Urban Europe
- ACT and ERA4CS are linked to JPI Climate
- Waterworks 2015 and Waterworks 2017 are linked to Water JPI
- ERA-GAS is linked to FACCE JPI

C: Main observations

There are a number of simple observations that can be made from the above overview:

- There is a greater concentration of ERA-NET Cofund actions in the thematic areas of climate and energy than for mobility
- The mobility theme is particularly well represented by Article 187 initiatives and ETPs
- There are several cross-cutting partnerships that span the whole Cluster including the EIP on Smart Cities and Communities, the Article 187 on digital innovation (ECSEL) and the Article 185 on metrology (EMPIR)
- The influence of the SET-Plan is clear in the portfolio of ETIPs within the 'energy' thematic area
- The ERICs are mainly in the 'climate' area

The 'energy supply' area has the most diversity of partnerships with 'buildings and industrial facilities in energy transition' and 'industrial competitiveness in transport' having the least.

1.2. Actors and activities

In general, the actors and activities for the different types of partnerships are not cluster-specific. The ERA-NET Cofunds involve national funding agencies, the JPIs involve research ministries and the non-P2Ps are dominated by the research community and industry.

Some specific observations for this cluster would include:



- For the 'energy' sub-cluster there is clear top-down influence from the SET-Plan, which involves the Commission and is linked to the EU 'Energy Union' policy. This means that the specific Horizon 2020 calls (e.g. ERA-NET Cofund Actions) include references to the relevant part of the SET-Plan.
- For the ERA-NET Cofunds in this cluster, the top three participants (by frequency of participation) are the Netherlands Organisation for Scientific Research (NWO), the Research Council of Norway and the Swedish Energy Agency. The last of these is more unusual for P2Ps. Otherwise, for most other countries it is the usual types of organisations that are participating.

A more detailed overview of the actors and activities for each type of partnership is included within the overall synthesis report of all the clusters.

2. Connections between partnerships and networks

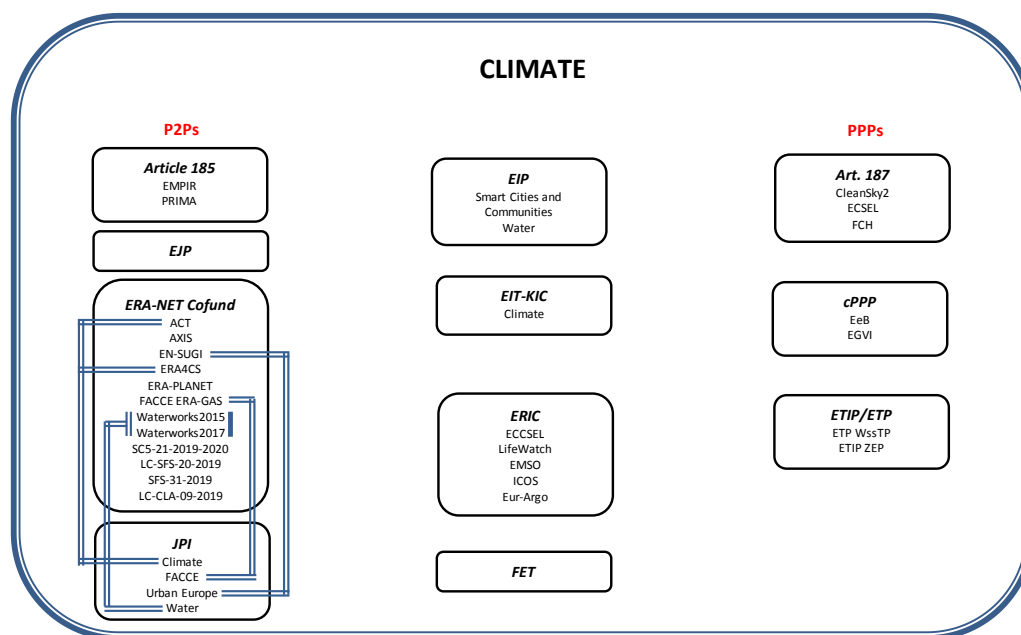
2.1. *Type of connections between the partnerships and networks*

The analysis below is an attempt to highlight the main connections that are apparent from desk research across the six main thematic areas of the Cluster 'Climate, Energy and Mobility'. It does not attempt to be comprehensive but provides an indication of the more obvious connections that are further discussed in the following sections. They include

-  Existing collaborations: e.g. joint calls or other joint activities (single, thick line). An example of existing collaboration is the ERA-NET Cofund GEOTHERMICA and the ETIP on Deep Geothermal, which collaborate concerning the Steering Board (see chapter 2.2. for details).
-  Formal connections: e.g. where one partnership is clearly linked to another (twin line). An example for a formal connection is JPI Climate and its Cofunds.

Please keep in mind that the lines do not show strength of connections but they just illustrate a certain type of collaboration as this was retrieved from the information of the networks' websites and expert knowledge available in the ERA-LEARN consortium.

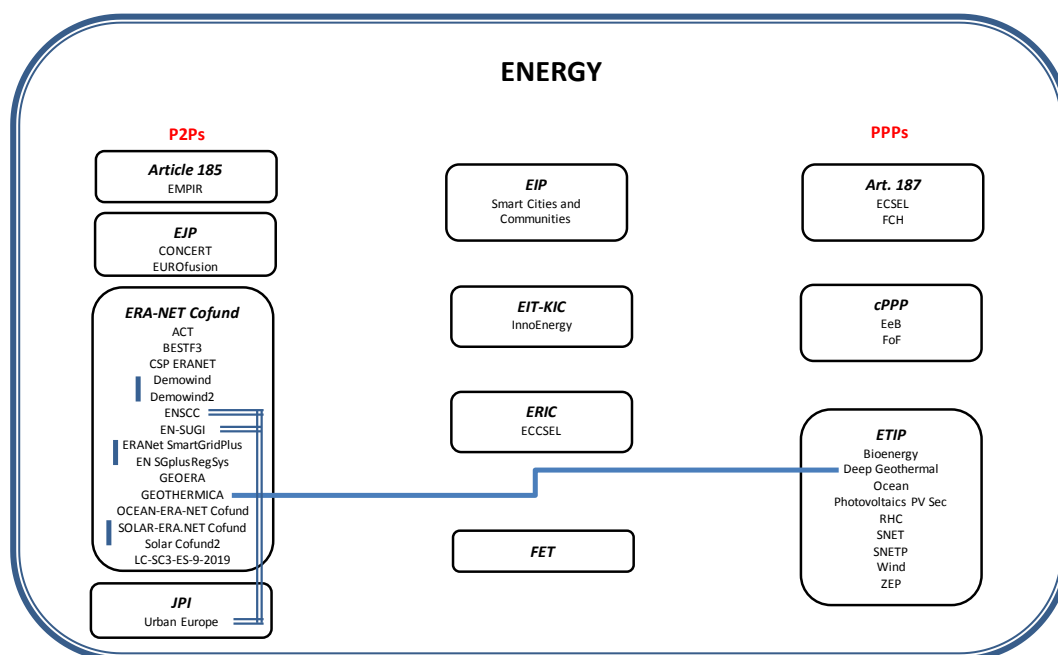
Figure 3-1: Description of connections between current partnerships and networks related to the Cluster 'Climate' of Horizon Europe



This is clearly quite a popular thematic area for P2Ps and it is also an area that has synergy with a number of JPIs in addition to JPI Climate. This includes JPI Urban Europe, JPI Water and FACCE JPI (perhaps even JPI Oceans although not shown in this graphic). Likewise, there is synergy with the 'environment' calls of EMPIR and the priorities of other Article 185 initiatives such as PRIMA (and perhaps BONUS). Some of the PPPs are at least partly relevant as they represent decarbonisation pathways for industry. A number of the ERICs are also relevant to this thematic area.

The most obvious connections are between the JPIs and specific Cofunds that can be regarded as implementation tools for their strategic agendas. Less obvious is the level of connection between partnerships like JPI Climate and EIT-Climate.

Figure 3-2: Description of connections between current partnerships and networks related to the Cluster ‘Energy’ of Horizon Europe



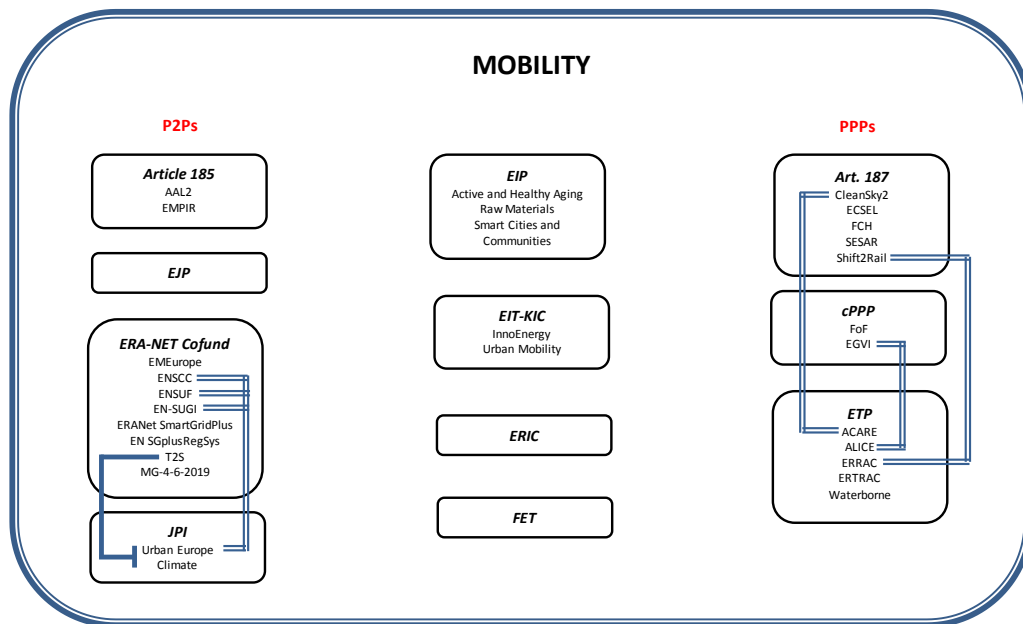
This is a highly populated thematic area for partnerships and the increasing, top-down influence of the SET-Plan⁴ is clear. This is most apparent in the way that the energy-related ETPs have been consolidated into nine European Technology and Innovation Partnerships (ETIPs). Less obvious, is the wider influence on the priorities of the P2Ps in this area that are increasingly apparent in the calls for project proposals (e.g. expectations of alignment with specific priorities of the implementation plans of the SET-Plan). There are also some examples of common membership of boards (e.g. the GEOTHERMICA ERA-NET is represented on the Steering Board of ETIP Deep Geothermal).

There are some clear connections amongst some of the P2Ps. For example, there are multiple ERA-NETs in the area of solar power and the coordinating organisation is common between SOLAR-ERA.NET Cofund and Solar Cofund2. A new Cofund on concentrated solar power (CSP ERANET) is also due to commence in 2019 but the degree of synergy is less clear.

Some connections are also apparent with partnerships that have a broader agenda (including energy) such as the EIP on smart cities and communities and JPI Urban Europe. Clearly, there is also an EIT-KIC in this thematic area.

⁴ The Strategic Energy Technology Plan (SET-Plan) is a high level EU framework to support the implementation of the Energy Union policy.

Figure 3-3: Description of connections between current partnerships and networks related to the Cluster 'Mobility' of Horizon Europe



What is immediately apparent from the analysis in this thematic area are the dominance of the public-private partnerships and the relative lack of P2Ps. Of course, there is some synergy with the scope of partnerships that have an interest in sustainable transport, especially in cities, such as JPI Urban Europe and the EIP for smart cities and communities. The presence of an EIT-KIC on urban mobility is also important. The connections between the long standing European Technology Platforms (ETPs) in this area can be traced back to the historical development of PPPs like CleanSky2, Green Vehicles (EGVI) and Shift2Rail. JPI Urban Europe is clearly a key player in this area. As well as directly spawning several Cofunds (ENSCC, ENSUF, EN-SUGI) it has also collaborated with another JPI (Climate) and a stand-alone ERA-NET (NORFACE) to implement the ERA-NET Cofund known as T2S (transformations to sustainability).

2.2. Examples of different types of interactions

A few selected examples are listed below to illustrate the different types of connections among the networks.

Formal connections (e.g. one serve as continuation or implementation of the other's work-programme)

- Most of the JPIs have exploited the ERA-NET Cofund instrument to support the implementation of their SRA/SRIA. For example, JPI Urban Europe has spawned ENSCC, ENSUF and EN-SUGI.
- SET-Plan and the ETIPs – the industrial platforms of the initial SET-Plan governance structure were simplified in 2016 when the six European Industrial initiatives were merged with eight European Technology Platforms to form nine distinct European Technology and Innovation Platforms (ETIPs).

Existing collaborations (e.g. joint activities, some joint decision making through common membership in boards)

- The Transformations to Sustainability ERA-NET Cofund (T2S) is a joint action between three partnerships (NORFACE, JPI Urban Europe and JPI Climate).
- Each of the 2018 Implementation Plans of the SET-Plan⁵ highlights key stakeholders. The ETIPs are clearly involved along with other partnerships such as KIC InnoEnergy, EIP SCC and one of the Article 187 initiatives (FCH). There is less evidence of direct representation of the ERA-NET Cofunds or JPIs but it is likely that there will be informal connections.
- The ERA-NET Cofund GEOTHERMICA is represented on the Steering Board of the ETIP on Deep Geothermal.

⁵ SET-Plan delivering results: The Implementation Plans, 2018

Other informal connections (e.g. sharing information, considering each other's priorities)

- The ERA-NET Cofund's in the 'energy' area are influenced by the priorities of the SET-Plan. For example, the 2018 Joint Call of the ERA-Net Smart Energy Systems (formerly SmartGridPlus) invites proposals that focus on the "development of Integrated Local and Regional Energy Systems in accordance with the SET-Plan Action 4 Implementation Plan." A more recent example is CSP ERANET (concentrated solar power), which is due to start in 2019 and will focus on priority R&I topics defined by the SET-Plan temporary working group on CSP.
- JPI Climate has been seeking closer cooperation with the Climate-KIC to support its objective to increase engagement with industrial stakeholders.
- The ERA-NET Cofund known as GEOTHERMICA (geothermal energy) has been trying to reach out to other synergetic partnerships including GEOERA, the ERA-NET Cofund on geological surveys, and the ETIPs on 'deep geothermal' and 'renewable heating and cooling'

2.3. Summary on overall connectivity between the networks

The overall impression from the analysis is that, with some notable exceptions, the level of connectivity between the various networks and partnership is weak. In many cases where there is cooperation, it seems that the prime mover has been the Commission through inclusion of requirements in the text of calls for proposal. This is partly validated by anecdotal feedback from the funding agencies that are involved in the ERA-LEARN consortium.

For the ERA-NET Cofund actions, it seems that there is a lack of time and resources to engage with other networks as their core mission is to implement joint calls. This is perhaps less so with the JPIs, which are operating at a higher policy level and have generally been more able to engage with other networks/partnerships using CSA funding.

It does seem, however, that (apart from the energy domain) there is very limited evidence of significant connectivity and exploiting complementarities between the P2P networks and the other types of partnerships.

The thematic models in Section 2.1 above, provides an overview of the landscape and there are obvious areas where some level of engagement of collaboration could be expected. Open questions would include:

- What is the level of synergy, cooperation and engagement between JPI Climate, the Climate KIC and other partnerships that are aimed at reducing climate impacts (e.g. CleanSky2).
- Are there any frameworks, like the SET-Plan, that could foster more collaborative activity between the P2Ps and the other partnerships/networks in the mobility areas?
- What would be the benefits of strengthening cooperation between partnerships/networks that appear to have synergies?
- What are the main barriers to collaboration between partnerships that have synergetic objectives, activities and/or stakeholders and the critical enabling factors for such collaboration?
- Is there a way that the JPIs and/or the EIPs in this area could work together to improve the connectivity between the P2Ps and the other partnerships?
- Could the Commission enable more collaborative action by providing opportunities through cross-partnership CSA calls?

3. Appendix

Summary of the various partnerships and networks that are relevant to the Cluster 'Climate, Energy and Mobility'

The black dots indicate 'full relevance' to the specific intervention area, whilst the white dots indicate 'partial relevance'.

Subject	Fit with Intervention Areas									Start	End	Members	
	Climate science/solutions	Energy supply	Energy systems/grids	Buildings/facilities in transition	Communities & cities	Ind. Competitiveness in transport	Clean transport/mobility	Smart mobility	Energy storage				
Public-Private Partnerships (A187)													
CleanSky2	Clean sky	○					○	●			2014		
ECSEL	Digital innovation	○	●	●	○	○	●	●	●	○	2014		
FCH	Fuel cells & hydrogen	○	●	○	○			●		●	2014		
SESAR	Air traffic management								●		2007		
Shift2Rail	Shift to rail						●	●	●		2014		
Article 185 Initiatives													
AAL 2	Active and Assisted Living					○					2014	2024	22
EMPIR	Metrology (includes thematic calls on energy, environment and industry)	●	●	●	○		○				2014	2024	28
PRIMA	Food production and water quality & availability in Mediterranean area	○									2018	2023	18
EIT-KICS													
Climate	Climate	●									2010		
InnoEnergy	Energy		●	●	●	○		○		●	2010		
Urban Mobility	Urban mobility					○			●		2018		
Public-Private Partnerships (cPPP)													
EeB	Energy efficient buildings	○	○	○	●					○	2008		
FoF	Factories of the future				○		○				2008		
EGVI	Green vehicles	○					○	●		●	2009		
ERA-NET Cofunds													
ACT	Carbon capture & storage	●	○								2016	2021	12
AXIS	Climate research	●									2018	2022	11
BESTF3	Bio-energy		●								2016	2020	12
CSP ERANET	Concentrated solar power		●								2019	2024	12
Demowind	Offshore wind		●								2015	2019	6
Demowind2	Offshore wind		●								2016	2020	9
EMEurope	Electric mobility							●	○	●	2016	2021	18
ENSCC	Smart Cities and Communities		○	○		●			○	○	2014	2019	28
ENSUF	Smart Urban Futures					●			○		2016	2020	25
EN-SUGI	Sustainable urbanisation	○	○	○		●					2017	2021	26
ERA4CS	Climate services	●									2016	2020	45
ERANet SmartGridPlus	Smart Grids		○	●	○	○		○		○	2015	2020	24
EN SGplusRegSys	Smart energy systems		○	●	○	●		○		○	2018	2022	24
ERA-PLANET	Observing our changing planet	●									2016	2021	37
FACCE ERA-GAS	GHG from Agri- and Silvi-Culture	●									2016	2021	19
GEOERA	Geological surveys		●								2017	2021	49
GEOTHERMICA	Geothermal energy		●								2017	2021	17
OCEANERA-NET Cofund	Ocean Energy		●								2017	2021	8
SOLAR-ERA.NET Cofund	Solar power		●								2016	2021	16
Solar Cofund2	Solar power		●								2018	2023	19
T2S	Transformations to sustainability					●					2017	2021	14
Waterworks2015	Closing the water cycle	○									2016	2020	33
Waterworks2017	Sustainable water in agriculture	○									2018	2022	23
MG-4-6-2019	Urban accessibility/connectivity					○							
SC5-21-2019-2020	Climate action, environment, resource efficiency and raw materials	○											
LC-SFS-20-2019	Low carbon, climate resistant future	○											
SFS-31-2019	ERANETs in agri-food	○											
LC-SC3-ES-9-2019	Digitisation of energy systems and networks			●	○				○				
LC-CLA-09-2019	Biodiversity and climate change	○											

	Subject	Fit with Intervention Areas									Start	End	Members
		Climate science/solutions	Energy supply	Energy systems/grids	Buildings/facilities in transition	Communities & cities	Ind. Competitiveness in transport	Clean transport/mobility	Smart mobility	Energy storage			
JPIs													
Climate	Climate	●									2012	2022	16
FACCE	Food security, agriculture and climate change	○									2010	2022	22
Urban Europe	Urban	○	○	○		●		○	○		2010	2022	22
Water	Water in a changing world	○									2011	2022	30
EJP Cofund													
CONCERT	Radiation protection		●								2015	2020	30
EUROfusion	Fusion electricity		●								2014	2020	31
European Innovation Partnerships													
Active and Healthy Aging	Active and healthy aging					○							
Raw Materials	Raw materials						○						
Smart Cities and Communities	Smart communities & cities	○	○	●	○	●		○	●	○			
Water	Europe and global water challenges	○											
ETP/EITP													
ETP ACARE	Aviation						●	●	●				
ETP ALICE	Logistics						●	●	●				
ETP ERRAC	Rail						●	●	●				
ETP ERTRAC	Road transport						●	●	●				
ETP Photonics21	Photonics		●										
ETP Waterborne	Maritime						●	●	●				
ETP WssTP	Water supply/sanitation	○											
ETIP Bioenergy	Bioenergy		●										
ETIP Deep Geothermal	Deep geothermal		●										
ETIP Ocean	Ocean energy		●										
ETIP Photovoltaics PV Sec	Photovoltaics		●										
ETIP RHC	Renewable heating & cooling		●										
ETIP SNET	Smart networks			●									
ETIP SNETP	Sustainable nuclear energy		●										
ETIP Wind	Wind energy		●										
ETIP ZEP	CO2 capture & storage	●	●										
European Research Infrastructure Consortium (ERIC)													
ECCSEL	Carbon capture and storage	●	●										
LifeWatch	Biodiversity and ecosystems	○											
EMSO	Sea and climate change	●											
ICOS	Carbon/GHG observation	●											
Eur-Argo	Subsurface ocean properties	○											

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