A French-German Cooperation Agenda for the Energy Transition in Europe

POLICY PAPER

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26.11.2018

This policy paper, a collaborative effort of four European think tanks, aims to help French, German and EU policy makers address current environmental, economic and societal challenges. It proposes eight concrete steps where active cooperation between France, Germany and other European countries could make decisive contributions to the Energy Union that benefit all European citizens: on the carbon price, the social aspect of the energy transition, electricity systems transition, the decarbonisation of the industry, the transition of the transport sector, energy and climate governance, its financing as well as innovations to support the transition. The first part of the paper provides the rationale for following these steps. The second part summarizes our concrete proposals.

Introduction

In May of 2019, European citizens will elect a new European parliament, paving the way for a new European Commission to lead Europe for the next five years. The fight against climate change is as a key policy priority for EU citizens, alongside migration, economic development and unemployment. Taking concrete steps towards a clean-energy future will contribute to these policy areas, as clean-energy measures boost investments, create jobs, deliver sustainable welfare and social justice, improve living conditions and fight climate change.

A successful energy transition in Europe requires a long-term vision for economic and societal transformation and actions that can make this vision a reality. Three years after the adoption of the Paris Agreement, the European Union, as part of the forthcoming EU Long-Term Energy-Climate Strategy,[1] which will be presented by the European Commission on November 28th 2018, is seeking to make several short-term energy policy decisions coupled with long-term climate objectives.[2]

France, Germany and their European partners have already made some progress towards decarbonising their economies, but significant challenges remain ahead if the EU is to keep up with the required pace of transformation. France and Germany have a key role to play in accelerating the transition to clean energy by encouraging more collaboration among Member States and pushing for concrete joint actions.

France and Germany have different starting points based on their previous policy decisions. Beyond these differences, however, the French *Transition énergétique* and the German *Energiewende* share several similar medium-term objectives.[3] Furthermore, despite some competing industrial interests (in the automotive sector, say), close cooperation between France and Germany on energy and climate issues has proven to be key in fostering the alignment of ambitious joint positions at the EU level and the development of new innovative proposals.

Energy and climate policy cooperation between the two countries is already taking place in various forms.[4] During the June 2018 Meseberg summit[5], France and Germany expressed their willingness to move forward by creating a new interministerial working group on climate change. The working group explores options that strengthen existing areas of cooperation among European states and proposes new ones.

Deliver a comprehensive carbon pricing framework

Carbon dioxide (CO_2) pricing – more commonly known as carbon pricing – is a very efficient way to shift investment from dirty energy to clean energy and to support other changes in behaviour. It also makes clear to businesses and citizens that the energy transition is a serious matter.

Europeans led the way in implementing CO2 pricing with the 1991 Swedish scheme pricing carbon for the heating sector and the 2003 Emission Trading

Scheme (ETS), which prices carbon for EU industries and power plants. Yet, despite recent reforms, the ETS price remains too low and too unstable to drive long-term investment. In non-ETS sectors, such as transport and heating, national governments have been unable to reach an agreement despite the European Commission's call to harmonize energy taxation and to price carbon more effectively. As a result, only 11 EU countries apply CO2 pricing in these sectors.[6]

France and Germany should commit to making carbon pricing work better than it does today by delivering a comprehensive carbon pricing framework. This should include a carbon price floor, which can foster the re-structuring of existing assets and lower the costs of deploying more renewables and energy efficient products and services throughout the economy.

Create a European social pact for the energy transition

The benefits of the energy transition are not intrinsically fair in their social distribution. But many options exist for extending those benefits to all European citizens and to respond to legitimate concerns for example about the increase in the price of fossil fuels for citizens. Doing so would strengthen social justice in Europe and enhance the political sustainability of the transition, which is threatened by reactionary groups who seek to use the social impacts of climate policies as part of a campaign to dismantle them.

At the moment, energy policies do have a negative effect on some workers and regions. Creating a socially-fair transition is a major political priority, as the ongoing discussions of the German Coal Commission[7] and the European Commission's Coal Regions in Transition Platform[8] have shown. Yet the energy transition has also created millions of new jobs. There are now more than a million Europeans working in renewable energy, and almost one million more in energy efficiency.[9] Providing the right skills to workers and attracting more young Europeans to energy transition jobs are key parts of fighting unemployment.

The energy system we inherited from the 20th century failed to deliver affordable energy services to all Europeans. Today, 50 million European families experience energy poverty.[10] Some of them are forced to restrict their use of heating at home and, as a result, many adults, seniors and children suffer from respiratory diseases.

To ensure a socially-fair energy transition, France and Germany should set up a joint committee to create a social pact for the energy transition.[11] This pact should be co-created and adopted by the EU, its Member States, regions, cities and social partners and should comprise measures targeted at lifting all Europeans out of energy poverty and addressing all regions and workers adversely affected by the energy transition.

Build shared transition strategies for the electricity system

Wind and solar have become cheap ways to generate electricity. To meet existing EU energy targets, renewables need to generate more than 50% of EU electricity by 2030. This will make renewables the pillar of the transition to a clean electricity system in Europe, which in turn will have a key role to play in decarbonising the transport, industry and heating and cooling sectors.

This paradigm shift is predicated on a fundamental transformation of the electricity system and its markets towards more flexibility and deeper cross-border integration. Upgrading and strengthening the European electricity grid and refining market structures over the next decade are part of the current electricity market design reform, which is supposed to be finalised by the beginning of 2019.

Today, Member States mostly fail to cooperate efficiently on key issues needed to accelerate the European integration process: ensuring security of supply for citizens, speeding up the development of renewables and restructuring conventional power plant fleets. This lack of cooperation increases the cost of the electricity for EU citizens and businesses.

As we noted, France and Germany share several similar goals despite their different starting points. Specifically, these include increasing renewable energy, improving energy efficiency and increasing the use of electricity in the transport and buildings sector. France and Germany, who make up the core of the EU electricity system, should draw on these shared goals to build a common vision for an electricity system transformation that recognizes that as renewable production grows the conventional power plant fleet should be resized to avoid stranded assets: coal must be phased out; nuclear power, decreased. In doing so, both countries should jointly assess the impact of additional initiatives for implementing the energy transition such as a carbon price floor and joint renewables support mechanisms.

Strengthen incentives to decarbonise carbon-intensive industries

Delivering on the Paris Agreement means that all new investment should be channelled into zero- or almost- zero-carbon technologies by 2035, including in CO2-intensive industries.[12] To date, progress in reducing industrial emissions has been slow. Stringent incentives to reduce emissions are missing in heavy industries due to fear of carbon leakage. The survival of those industries and their related jobs in Europe will depend on the creation of the right policy conditions for them to pursue breakthrough innovations that increase their competitiveness in a zero-carbon economy.

The innovations currently under development have produced some promising results: direct electrification, green hydrogen, power-to-X technologies, CO2 valorisation and the circular economy, among others. But new technologies like these face a "valley of death" when private investments fail to close the gap between a successful pilot and the commercialisation phase. In addition, improving the quality and quantity of recycled carbon-intensive materials is essential for decarbonising the industrial sector, which in turn can lower input costs and raise profit margins.

In both cases, a large coordination between countries in Europe would facilitate the transition by mutualising investment and achieving quicker economies of scale. To lay the foundation for a modern and decarbonised European industry, France and Germany should work together to set up new policy instruments that bring innovations to the market and promote the use of low-carbon and recycled materials.[13]

Lead the energy transition in transport

Policy makers should ensure a smooth transition towards cleaner alternatives for the transport of passengers and goods. In face of the growing influence of Chinese and American competitors, the EU transport industry needs to spearhead a clean mobility transition that rises above the fray of competing industrial interests. In this regard, France and Germany have a strong interest in drumming up support for more investment in clean alternatives. After all, the automobile industry in these countries alone accounts for about 43% of the cars produced in the EU.[14]

The transport sector today relies almost entirely on oil (94%). It represents one-quarter of EU's GHG emissions and is the only sector where EU emissions have risen consistently since 1990. Road transport alone produces over 70% of GHG transport emissions and should thus be a priority concern for decarbonisation.[15] In terms of employment, the transport sector represents over 10 million jobs in the EU.[16] Alternatives exist – electric vehicles, walking and cycling

for short trips, a general modal shift to electrified rail – but their use is still limited.

To make the mobility transition a success, a close cooperation between France and Germany and their European partners is needed for cross-border investment and common standards for infrastructure (e.g. railways, electric mobility, catenary trucks, etc.), and public transportation (e.g. trams). This cooperation should also promote modal shifts to cleaner transport solutions and shorter distances between freight hubs (ports and airports).

Govern the energy transition

Making the energy transition a success requires long-term visibility for citizens, workers, businesses, regions and nations. It demands a robust governance able to transcend party politics and vested interests and to deliver immediate actions embedded in a long-term strategy.

The energy transition today rests on a sound democratic consensus: 90% of Europeans favour public support for energy efficiency and renewables.[17] Germany's *Energiewende* and France's *transition énergétique* have each set up long-term objectives and a national governance framework for energy transitions. Their policies are now embedded in the larger context of the EU Energy Union and of the Paris Agreement. The European Commission will soon present its long-term strategy to the European Parliament on November 28. In the run-up to COP24, this is an opportunity to align EU commitments with long-term goals and prove that the new international climate regime set up by the Paris Agreement can make progress in the fight against climate change.

If France and Germany are to play an exemplary role in the governance of the energy transition, they should involve all stakeholders in the decision-making process for their respective energy and climate strategies. This includes consulting with each other and their neighbouring countries on issues relevant beyond national borders and endorsing planning documents at the highest political level.

Reorient financial flows towards the energy transition

Achieving the objectives laid out in the Paris Agreement will require significant investment in buildings, transport systems, vehicles, power plants and many other parts of the infrastructure that supports the economy – and our daily lives. In turn, the transition will also require a radical shift away from investment that has adverse effects on the climate or that locks us into an energy system based on fossil fuel. The financial sector thus faces a clear challenge: redirect funds to finance what we truly need for our future and find the appropriate tools to track progress and enact change.

The Paris Agreement requires that public and private financial sector actors assess and improve their contribution to the fight against climate change. There are several ways that France, Germany and the EU can support this. First, they can ensure that the entire EU budget is invested in projects and activities that contribute to, or are compatible with, the fight against climate change. Second, they can track and assess progress in meeting climate and sustainability investment goals – including how investment is financed by public and private resource.[18] Finally, National Energy and Climate Plans should systematically include investment and finance components to signal investment needs and the instruments for funding them.[19] Making progress in these areas will help close the investment gap for achieving the 2030[20] and 2050[21] targets, which in 2016 the European Commission estimated to be €180 billion a year.

Innovate to boost competitiveness while fighting climate change

Europe's competitiveness in key sectors of the economy is under threat from rising US and Chinese competition (with regard to, say, electric vehicles and batteries). To remain a relevant economic and industrial player on the global stage and promote the creation of quality jobs, Europe needs to step-up its game and improve its support of innovation-based competitiveness.

Today, innovations to fight climate change are critical for preparing the radical transformation of the global economy into a net-zero GHG economy. Although Europe represents less than 10 % of global GHG emissions, it accounts for more than 20% of global GDP and 30% of scientific publications. Hence, Europe should use its economic and innovative strengths to remain a leader in energy innovation – exporting its innovations to other continents and contributing to the fight against climate change on a global scale.

Europe, France and Germany are scientific powerhouses. The French CEA and German Fraunhofer are among the best research centres in the world, and both devote much of their work to energy issues.[22] As underlined by the Lamy Report,[23] the challenge for Europeans is to turn high quality research into market-ready innovations. The recent French[24], German[25] and EU proposals[26] on increasing R&I budgets, creating disruptive innovation agencies and building R&I missions are key opportunities to align Europe's industrial renaissance with the fight against climate change.

Action plan for a French-German cooperation agenda for the energy transition in Europe

1 Deliver a comprehensive carbon pricing framework

France and Germany should

- Initiate bilateral work on the gradual alignment of their national energy taxation systems aiming at a more effective carbon pricing in the buildings and transport sectors (non-ETS sectors). They should also build on the existing EU Energy Taxation Directive to propose a so-called "enhanced cooperation"[27] with like-minded Member States and to deliver a comprehensive carbon pricing framework in those sectors. This framework should be enshrined in a broader fiscal reform benefiting the most vulnerable citizens to ensure a socially-fair energy transition (see below).

- Begin credible steps to phase out all fossil fuel subsidies, as they act as de facto subsidies to pollution. This objective should be embedded in the European Semester and included in the EU budget.

- Push for the introduction of a regional carbon floor price on electricity production from 2020 based on the Dutch proposal.[28]

- Propose the creation of a carbon contribution in the EU budget in the next Multiannual Financial Framework that would compensate EU budget losses due to Brexit. Even a symbolic price of 5€/TCO2 placed on all EU energy emissions would generate significant revenues (around 15Bn€/y). This carbon contribution could be implemented in ETS sectors by allocating a corresponding part of EUA auction revenues to the EU budget and through direct energy taxation for non-ETS sectors.

2 Create a European social pact for the energy transition

France and Germany should

- Consolidate the EU Coal Regions in Transition Platform and incentivise coal regions to develop Platform, roadmaps preparing a desirable economic future beyond coal. Lessons from this platform should be used for the restructuring of industries such as diesel car production that will disappear over the course of the energy transition.

- Guarantee that proper funding is planned to effectively ensure that not a single worker and not a single region is left behind by the energy transition. When negotiating the EU Budget (MFF), France and Germany should be adamant about the creation of a European Transition Support Fund based on the European Globalisation Adjustment Fund. The Transition Support Fund should be large enough to provide financial assistance to Member States when major restructuring events occur.[29]

- Draft an EU Plan with the European Commission, other Member States, anti-poverty associations and public services that build on the findings of the European Energy Poverty Observatory in order to lift all Europeans out of energy poverty by 2030. This will require an extensive deep renovation of energy-inefficient buildings targeted to those where poor European families live with the support of national and EU Energy Poverty Funds.

3 Build shared transition strategies for the electricity system

France and Germany should

→ Conduct in early 2019 a joint assessment at the bilateral or regional level (as part of the Pentalateral Energy Forum, say) that evaluates their national strategies in the electricity sector based on the draft of the *Programmation Pluriannuelle de l'Energie* and the recommendations of the *Wachstum, Strukturwandel and Beschäftigung* Commission for a coal exit pathway. This joint assessment should also facilitate the consulting and reviewing processes of the National Energy and Climate Plans (NECPs) in the power sector.

→ Develop and adopt NECPs that are consistent with the latest EU renewable target of 32% by 2030 and describe a concrete scenario for the reduction of nuclear power production in France and the phase-out of coal power production in Germany.

→ Estimate the impact of additional initiatives to implement the energy transition such as a carbon price floor or joint renewables support mechanisms. The results of this assessment should be reflected in the National Energy and Climate Plans (NECPs) presented by France and Germany to the European commission as part of the new governance regulation framework (see below).

→ Boost the deployment of renewable energy and create more market certainty by scaling up and better coordinating yearly renewables auctions. This commitment could be announced jointly by both countries and, if possible, other member states.

→ Explore and compare assessments of the increased development of decarbonised fuels such as green hydrogen and synthetic fuels for energy system infrastructure to 2050, as part of their response to the forthcoming EU Long-Term Climate Strategy.

4 Strengthen incentives to decarbonise carbon-intensive industries

France and Germany should

→ Assess options for complementary policies supporting the early-stage commercialisation of innovative zero-carbon materials and processes in the industrial sector. Such options may include a premium based on a guaranteed CO2 price for ultra-low carbon materials and a green public procurement that creates markets for zero-carbon materials.

→ Develop measures to strengthen existing recycling polices to significantly improve the quality and quantity of recycled materials in very carbon-intensive industries (such as steel, cement/concrete and plastics). Such measures could be tackled as part of the EU eco-design directive.

5 Lead the energy transition in transport

France and Germany should

→ Agree on a common decarbonisation path for road transport in order to send a clear signal to industry and consumers and to further the energy transition at the EU level.

→ Follow up on their joint 2016 commitment to developing a corridor of reliable and interoperable electric charging points, providing a stable framework for investment in electric vehicles (EVs) and lessening consumers' range anxiety.

→ Support a cross-border industrial partnership within the framework of the European Battery

Alliance. France should match the German government's commitment[30] to developing an internationally competitive European consortium.

→ Promote a modal shift from road and air to rail by improving passenger train connections and inter-city infrastructure.

→ Encourage shippers and carriers to reduce the carbon footprint of freight transport by promoting a shift to cleaner transport modes such as catenary trucks and by shortening transport distances.

6 Govern the energy transition

France and Germany should

→ Consult each other during the drafting and reviewing of their National Energy and Climate Plans (NECPs) planned in 2019 under the Energy Union Governance Regulation. France and Germany should also work together with other willing Member States to include in their NECPs issues of regional relevance and to prioritize areas of cooperation where joint efforts are more effective: renewable energy development, carbon pricing, socially-fair energy policies, industrial decarbonisation, clean mobility and investment.

→ Be exemplary climate strategies by the end of 2020 that are consistent with Energy Union and Paris Agreement objectives for 2050. Those strategies should be the result of effective engagement with civil society – citizens, regions, cities, workers and businesses.

→ Transpose the NECPs and 2050 national strategies into effective legislation and ensure that they are endorsed by French and German heads of state and government, the majority of parliament, regions, trade unions and business associations.

7 Redirect financial flows towards a energy future

France and Germany should

→ Support an increase to over 30 % of the share of the EU budget devoted to actions that address climate change, and they should make sure a phase-out date is set for all EU money going to fossil fuels, including gas infrastructure projects.

→ Ensure that the Sustainable Finance Observatory – recommended by the High-level Expert Group on Sustainable Finance (HLEG) reports – covers both climate investment and financial flows at the EU and Member State levels, prioritizing the inclusion of both "financial market data" and tracked climate-related "end investment" in the real economy.

→ Improve climate investment and finance tracking at both the Member State and EU levels to ensure that the needed data is available for both national and EU policy making. This requires that sufficient resources be allocated to the relevant national and EU bodies, such as the European Environment Agency.

→ Include a systematic approach for Member States to meet the investment, financial planning and reporting requirements of the National Energy-Climate Plans expected to be introduced in 2019.

→ Ensure that the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB), who are in the process of revising their energy strategies, fully align their financing with the Paris Agreement and restrict the funding of fossil fuel projects to extremely rare exceptions.

8 Better support the development of competitive energy innovations

France and Germany should

- Make R&I a priority in the current MFF negotiations[31] and support the increase of Horizon Europe's budget to €120 billion, as endorsed by the European Parliament.

- Ensure that at least 40% of Horizon Europe R&I investment is allocated for climate-related measures to create a net-zero emissions economy in 2050.

- Task the European Innovation Council with providing patient capital to fund breakthrough energy innovations that target returns on investment over a period of at least ten years. They should encourage the EU and its Member States to design more flexible government programmes that can better leverage private-sector investment. And they should ensure that French and German agencies for disruptive innovation work closely with the European Innovation Council and the European Institute of Technology.

- Ensure that there are at least two climate-relevant EU R&I Missions.[32] One mission should support innovative projects that can make over 100 European cities carbon neutral by 2030. This will create a scale effect for innovators, investors and industry. It will also show citizens that the energy transition can bring real improvements in their lives. French and German cities could show the way by building on already existing cooperations such as Tandem.[33]

[1] See Public consultation on the strategy for long-term EU greenhouse gas emissions reduction.
[2] 14 EU environment ministers, including those of France and Germany, have supported this effort by asking the EU Commission to study how the EU's current GHG reduction target for 2030 could be strengthened and to include a pathway compatible with the limitation of temperature increase to 1.5°C and with carbon neutrality in 2050 in the EU Long-Term Climate strategy, which is due to be published in November of 2018 in the run-up to COP24.
[3]For an assessment of the challenges in the power sector in both countries, see Agora Energiewende and IDDRI (2018) The 'Energiewende' and the 'transition énergétique' by 2030
[4] It includes a high-level bilateral group between French and German ministries, the French-German Office for energy transition (OFATE), the partnership between the German and French energy agencies (DENA and Ademe) for formulating concrete bilateral projects (in particular the Smart Border Initiative), the TANDEM cooperation project between French and German municipalities to support a local clean-energy transition, the French-German high level group on rail transport, the cooperation agreement between the Hamburg port authority and the Grand Port Maritime de Marseille aiming at CO2 reductions of port activities and promoting a modal shift from truck to train and the French-German-Luxembourgian cooperation on automated and connected driving.
[5] See Meseberg Declaration: "Renouveler les promesses de l'Europe en matière de sécurité et de prospérité".
[6] For a detailed panorama of carbon prices in the World, see "Global Carbon Account 2018", I4CE, 2018.
[7] Kommission Wachstum, Strukturwandel and Beschäftigung: https://www.kommission-wsb.de/WSB/Navigation/DE/Home/home.html.
[8] Coal Regions in transition platform: https://ec.europa.eu/energy/en/topics/oil-gas-and-coal/coal-and-other-solid-fuels.
[9] Data for employment in the renewables industry can be found in EurObserv'ER's 9th, 12th and 15th annual barometers of the state of renewable energies in Europe. For employment in energy efficiency, see Cambridge Econometrics, Assessing the employment and social impact of energy efficiency, November 2015, p. 7. This study defines "employment in energy efficiency" narrowly as "employment in firms whose principal activity is the supply of goods and services for which the main motivation for purchase by the customer is to save energy."
[10] See data from the EU Energy Poverty Observatory.
[11] See the policy brief "Europe needs a social pact for the energy transition", Jacques Delors Institute, 29 January 2018.
[12] Bataille and all,"A review of technology and policy deep decarbonization pathway options for making energy-intensive industry production consistent with the Paris Agreement", Journal of Cleaner Production, Volume 187, 20 June 2018, Pages 960-973
[13] See the policy brief "Filling gaps in the policy package to decarbonise production and use of materials", Climate Strategies & DIW, June 2018.
[14] ACEA, 2017 data.
[15] European Environment Agency (EEA)
[16] Statistical Pocketbook Transport 2017 – based on 2014 Eurostat data.
[17] Eurobarometer, November 2015.
[18] France is the only country today that requires climate investment data to be reported as part of the annual budget process and that conducts an annual assessment of both climate investment and finance flows. Partial climate investment data is available from other European countries. Climate finance "landscape" studies cover both end-investment and financial flows from public and private stakeholders in tracking where the transition stands year after year and providing a sector analysis. For more details, see Lola Gouiffes, Hadrien Hainaut, Ian Cochran, "Low-carbon investment 2011 – 2017", I4CE, 27 September 2018.
[19] Currently, the topic of investment is addressed in a piecemeal fashion across Articles 3, 7, 8 and Annex 1 of the Governance Regulation.
[20] See https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition
[21] For more detail, see "Assessing the state-of play of climate finance tracking in Europe. A report for the European Environment Agency", Trinomics, 2017.
[22] SeeThomas Pellerin-Carlin and Pierre Serkine, "From distraction to action – towards a bold Energy Union Innovation Strategy" Jacques Delors Institute, June 2016.
[23] High Level group on maximising the impact of EU research & innovation programmes, Lab-Fab-App: investing in the European future we want, European Commission, July 2017.
[24] French President Macron proposed the creation of a French-German agency for disruptive innovation. See Paul-Jasper Dittrich, Philipp Staender, "How would a European disruptive innovation agency look like", Jacques Delors Institute-Berlin, December 2017.
[25] Germany has stepped up its game in its recently adopted 7th Energy Research Programme, which increases public investment in energy research by 45%. It also announced the creation of the Agentur zur Förderung von Sprunginnovationen.
[26] The European Commission has proposed the creation of a European Innovation Council as well as the creation of Research and Innovation (R&I) Missions. See Philipp Staender, "Research policy: guide to the negotiations on Horizon Europe", Jacques Delors Institute-Berlin, July 2018.
[27] An enhanced cooperation is a procedure where a minimum of nine EU member states are allowed to establish advanced integration or cooperation within the EU framework but without the involvement of all the other Member States.
[28] A consultation over a draft law to implement it in 2020 took place during the summer of 2018. See https://www.internetconsultatie.nl/minimumco2prijs
[29] Sofia Fernandes, "Towards a European transition support fund", Policy paper n° 231, Jacques Delors Institute, 22 October 2018.
[30] See https://www.bmwi.de/Redaktion/DE/Pressemitteilungen/2018/20181113-altmaier-thesen-zur-industriellen-batteriezellfertigung.html
[31] See Philipp Staender and Pola Schneemelcher, "Why innovation could struggle to be a priority in the next MFF", Jacques Delors Institute-Berlin, April 2018.
[32] For a policy paper on R&I Missions, see Philipp Staender, "Missions for EU innovation policy: the set-up matters", Jacques Delors Institute-Berlin, May 2018.
[33] See Tandem.

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