
A French-German Energy Transition Alliance in Europe

The Case of the Power and Transport Sectors

Introduction: Joint Challenges and Opportunities Ahead for France and Germany

Both France and Germany have ratified the Paris Agreement on Climate Change and are pursuing broad, long-term strategies to deeply decarbonise their economies by 2050. (France aims to reduce GHG emissions by 75% and Germany by 80 to 95% relative to their 1990 levels.) This strong political commitment to fighting climate change is deeply rooted in values and beliefs of German and French citizens and enjoys broad public support in both countries.¹

The French *transition énergétique* and the German *Energiewende* form the backbones of their respective decarbonisation strategies. Both envisage step-by-step changes in the energy system, encompassing the power, transport and heating & cooling sectors.

Even if fighting climate change does not make daily headlines, these long-term strategies mean the German and French economies are broadly moving in the same direction and will face similar challenges with regard to infrastructure development and industrial policy, research & innovation, higher education and professional training.

Despite differences in their energy mixes, France and Germany will face several **joint challenges** on the way to a clean-energy future. First, their existing power systems are largely rooted in baseload power plants (coal in Germany and nuclear in France), and each aims to develop a modern, flexible system focusing on wind and solar resources. Second, both countries have transport sectors whose fuel supply is more than 90% oil based. Car manufacturing industries have heavily invested in diesel technologies and now face serious challenges with

the development of e-mobility. Third, decisions taken in Germany or in France invariably have repercussions for the other. Fourth, the countries' central location between East and West, North and South and the size of their economies means that an alliance between both countries could encourage energy transitions all across Europe. And fifth, reforming European institutions to better address the European and global challenge of climate change hinges on Germany and France's ability to come up with innovative proposals, given these countries' key role in driving European integration.

Policy areas in the power and transport sectors where joint challenges emerge include (i) integrating rising shares of wind and solar PV in the power system; (ii) restructuring existing power-generating assets; (iii) initiating a clean-energy transition in the transport sector; (iv) just transition strategies for regions and workers affected by structural change; and (v) leveraging the scale and pace of public and private investments for a clean-energy future.

In this paper, we further explain these **joint challenges** to the German and French energy transitions. We then identify **priority areas for forging a French-German energy transition alliance** and close by proposing how such an alliance could be embedded in a **broader initiative to reinvigorate the European integration project**.

¹ In surveys from 2015, 72% of Germans and 69% of French citizens said climate change was a very serious problem. See Special Eurobarometer 435.

Joint Challenges in the Energy Transitions of Germany and France

Integrating rising shares of wind and solar PV in the power system

Due to massive cost reductions over the past few years, wind energy and solar PV are increasingly outcompeting other generating technologies for new investments. Recent auctions for onshore wind in Germany resulted in prices of 5.71 ct/kWh. Recent auctions for ground-mounted solar in France came out at 6.25 ct/kWh.²

France and Germany are both committed to increasing electricity from renewable sources as a core pillar of their long-term transition strategies. Germany aims to reach a share of at least 50% renewable electricity in its electricity consumption by 2030 (versus 32.5% in 2015), while France aims for a share of 40% of renewables in its electricity production in this time horizon (versus 18.7% in 2015).

At such levels of power system penetration, wind and solar technologies will fundamentally change electricity systems and markets.³ In particular, because their levels of generation fluctuate based on weather conditions, power systems must be made more flexible. On the generation-side, power plants are gradually moving away from baseload operation, and must adapt their output to the variation of renewables. Innovative technological solutions through demand-side response, the development of smart digital grids and the gradual integration of the power, transport, and heating & cooling sectors will allow the cost-effective integration of ever-higher shares of renewable energy, especially at local and regional levels. On a continental scale, strengthening

the physical and market integration between countries is a key strategy for enhancing system flexibility at a low cost.

Restructuring existing generation assets

Phasing out coal in Germany

In Germany, power generation is still dominated by hard coal and lignite power plants (which covered 42% of national electricity production in 2015). To meet the national climate target, the share of coal in the power sector will have to be cut in half by 2030. But based on current energy market trends (in particular, the persistence of low prices for coal and CO₂ emissions certificates), the reduction of coal-based electricity will not proceed at quick enough pace. A significant strengthening of the EU Emission Trading System would help to reach this goal. As of 2017, this looks unlikely, however.⁴ Accordingly, faster and more far-reaching national measures must be considered. A long-term and consensual phase-out plan for coal-fired generators, as proposed by Agora Energiewende, would allow a just and gradual transition in Germany, and provide certainty to all stakeholders.⁵

Redimensioning nuclear in France

Adopting a clear strategy for redimensioning nuclear energy in France will be a pressing challenge in the coming years. The French energy transition law aims to integrate 40% renewables by 2030 and reduce the share of nuclear power from its current level of 75% to 50% by 2025. At the same time, France's aging nuclear fleet will need significant investments to extend its lifespan beyond 40 years.⁶ In the context of a stagnating or slightly decreasing electricity demand, the French strategy for redimensioning the nuclear fleet will have to be carefully

2 See overview in Agora Energiewende (2017). The Cost of Renewable Energy, p.6, table 2.

3 See IEA (2017), Getting Wind and Sun onto the Grid: A Manual for Policy Makers.

4 In particular, it is very unlikely that EU policy makers in countries with large shares of coal and/or energy-intensive industries will agree on any instruments reaching the required carbon price needed to phase-out the most recent lignite power plants (> 60 EUR/tCO₂) by 2040.

5 In order to make a meaningful climate contribution, a national phase-out initiative of coal should be accompanied by retiring the emissions trading allowances set free by the coal phase-out.

6 About half of the current installed capacity (63 GW) will exceed its 40-year lifespan between 2018 and 2025. The affected power plants will need significant retrofit investments if they are to operate for another 10 to 20 years. [A general note: Footnote formatting is somewhat inconsistent throughout.]

coordinated with renewable deployments and take into account the interactions with neighbouring power systems to control the cost of electricity and limit the risk of stranded assets in the power sector.⁷

Transitioning to clean energy in the transport sector

The transport sector is becoming an increasingly important area for decarbonisation. In Germany, transport emissions have effectively stayed the same for the past twenty years.⁸ Similarly, France's transport emissions have stalled after peaking in 2004.⁹

In both countries, the car industry is facing the biggest and most important transformation since the invention of the internal combustion engine. Electrification, digitization, automation and shared mobility are key trends that are transforming the industry globally, with North America and China emerging as leading markets. Progressive decarbonisation will be accompanied by a sharp rise in all types of electric vehicles (battery electric, plug-in, fuel-cell vehicles). The industries in France and Germany need to master the structural transformation if they are to remain competitive on the global market.

When it comes to e-mobility, both countries must invest more in charging infrastructure proportionate to the expected increase of electric vehicles. Charging stations in France and Germany need to be interoperable so that e-mobility is easy and seamless for drivers travelling between the countries and across Europe.

Integrating electric transport into the power system brings with it both challenges and opportunities. If not properly managed, it could increase peak demand and strain the grid. Smart-charging options

(automatic or based on set tariffs) will help shift demand for charging to periods when overall demand is lower or generation is higher.

Developing just transition strategies for workers and regions affected by structural change

Lignite mining in Germany and France's nuclear power sector are examples of industries concentrated in geographic areas where sudden plant closures would have a significant negative impact on the local economy. Unless closures are planned ahead and accompanied by measures for the affected workers and regions, local economies could, as so often in the past, begin a vicious downward spiral hurting generations for decades to come.

The German and French energy transitions will be more successful if accompanied by just transition strategies for workers and regions affected by structural change. Just transition strategies engage local communities, municipalities and companies early on in a structured dialogue to develop measures that will help avoid disruptions and help local communities and workers better adapt to the changes. They could involve specific measures to compensate (permanent or temporary) economic losses and support new economic activities or worker training programmes. Experience from earlier transitions should inform transition strategies in the power sector and in the automotive industry.

7 For more details, see Rüdinger, A. et al (2017) "La transition du système électrique français à l'horizon 2030 - Une analyse exploratoire des enjeux et des trajectoires," Iddri Study n° 5/2017.

8 At 166 MtCO₂, the current level of emissions in the transport sector is 3 MtCO₂ metric tons higher than in 1990. See Agora Verkehrswende (2017): Mit der Verkehrswende die Mobilität von morgen sichern. 12 Thesen zur Verkehrswende.

9 In 2015, France's transport sector emitted 133 MtCO₂, a modest 2.8 % increase relative to 1990 levels (CITEPA).

Leveraging public and private investments for a clean-energy future

The energy transition requires massive investments – in France, in Germany and elsewhere in Europe.¹⁰ Renovating existing buildings will be the main financial challenge in Europe. And meeting the 2030 renewable energy targets in the power sector will require the addition of at least 47 GW of wind and solar capacity in France¹¹ and about 90 GW in Germany.¹² Significant investments are also needed for modernising and expanding the transmission and distribution grid infrastructure in both countries.¹³

Building the infrastructure of the energy transition is a capital-intensive endeavour. Hence, the cost of capital will play a critical role in determining the overall amount of investment required. This suggests that a blending of public and private finance will often be the preferred approach as this strategy can keep down public costs for needed investments, take advantage of the leverage effect on private funding and provide the right incentives to all actors. This strategy also involves a variety of public actors (states, regions, cities) whose ability to finance the transition at the local scale will be crucial, too. The availability of appropriate infrastructure is, in many respects, a prerequisite for the market-driven, rapid take-up of clean and smart technologies, be it electric vehicles, smart metering or innovative storage solutions.

Forging a French-German Energy Transition Alliance: Priority Areas

Close cooperation between France and Germany on energy is nothing new. In fact, energy-policy cooperation was at the heart of cooperation to rebuild Europe after the Second World War.¹⁴

In recent years, energy policy cooperation between Germany and France has taken place in various forms. It includes a high-level bilateral group between French and German ministries in charge of energy, the French-German Office for energy transition, as well as a partnership between the German and French energy agencies (DENA and Ademe) to formulate concrete bilateral projects.¹⁵ This cooperation has increased mutual understanding, facilitated the communication of best practices and fostered the alignment of joint positions at the EU level.

In the wake of efforts to combat climate change, and with long-term energy transition strategies in place that also aim to reinvigorate the European project, the time seems ripe for moving forward. We propose the creation of a French-German Energy Transition Alliance to develop actions tackling the joint challenges described above.

Priority areas for this alliance should include:

- (i) Drafting a joint strategic vision on the energy transition and its role in re-invigorating European integration;
- (ii) introducing a joint initiative on carbon pricing;

10 It should be noted that not investing in the transition would also require governments to spend similar amounts of money given the modernisation needed for existing fossil-based infrastructure. See Agora Energiewende 2017: Stromwelten 2050 – Analyse von Erneuerbaren, kohle- und gasbasierten Elektrizitätssystemen.

11 See Programmation Pluriannuelle de l'Énergie (2016), Mean of high and low 2023 capacity targets extended to 2030.

12 See Netzentwicklungsplan (2016) in line with federal government growth corridor.

13 For example, French TSO RTE put the investment costs needed to upgrade the transport grid at 10 billion euros for the next ten years alone. See RTE (2016) Schéma décennal de développement de réseau.

14 Notably, the founding treaty of the European Coal and Steel Community concluded between Belgium, France, West Germany, Italy, the Netherlands and Luxembourg entered into force 65 years ago, on 23 July 1952.

15 The Smart Border initiative is the first example of such a project. Currently in its developing phase, it is designed to be a pilot project for optimising the integration of cross-border energy systems between Saarland and the Lorraine region. Its originality lies in multisector coverage (transport, industrial energy efficiency, power) and a focus on local grids. One of its purposes is to see if the low-voltage grid between the countries can handle high-voltage interconnectors.

- (iii) coordinating renewable energy development;
- (iv) cooperating for a clean-energy transition in the transport sector;
- (v) collaborating in the development of integrated national energy and climate plans (NECPs);
- (vi) introducing a finance and investment initiative for energy transition.

1 Developing a joint strategic vision for the energy transition

New and existing initiatives between Germany and France should be embedded in and guided by a joint strategic vision for the energy transition that is endorsed by political leaders in both countries. The programmatic, long-term perspective of this vision would make it a useful point of reference in debates about enhancing power system flexibility, about the restructuring of existing generating assets or about just transition initiatives. A joint strategic vision could focus cooperation and help unlock synergies between initiatives. It would also facilitate the broadening of dialogue and cooperation between cities, municipalities, civil society groups, think tanks, science organisations, etc. beyond the scope of government initiatives. A joint strategic vision by German and French leaders on the energy transition would also be a means to articulate how the energy transition fits in with a broader initiative to re-invigorate the European integration project.

2 A joint initiative on carbon pricing

Putting a price on carbon is generally an effective tool to make market actors and market transactions respect climate change priorities. France and Germany should commit to making carbon pricing work better than it does today, both in sectors covered by the Emission Trading Scheme (ETS) and in sectors outside the ETS such as the transport and residential sectors.

In sectors covered by the ETS, a higher carbon price would facilitate the re-structuring of existing generating assets and lower the cost of deploying new renewable energy capacity in line with national renewable energy targets. Final legislative discussions on further ETS reform are currently ongoing between the European Parliament, the Council and the European Commission and could be concluded by September. Hence, we propose that, until then, Germany and France give priority to achieving the most ambitious possible outcome in reforming the EU emissions trading system.¹⁶ Thereafter, France and Germany should assess the need for further steps. This could include the introduction of a regional carbon floor price for the power sector, starting with France and Germany. A meaningful carbon floor price could incentivise a shift from coal to less CO₂-emitting power production. To be politically acceptable in Germany and France, such an instrument would need to be supplemented by measures addressing distributional challenges within consumers and between countries. Since a carbon floor price would, in the short run, adversely affect German coal power plants and benefit French nuclear power plants, reaching agreement on a carbon floor price would likely require a commitment by France to re-structure its nuclear fleet and a joint strategic vision that includes the development of renewable energy in both countries.

In the transport and residential sectors outside the ETS, Germany and France could initiate work on the gradual alignment of their energy taxation system, while pricing carbon more effectively. Currently, in both countries, energy transition funding relies heavily on electricity consumers. One option could be to reallocate parts of the cost-recovery schemes for renewable electricity (EEG Umlage, CSPE) to fossil fuels. This kind of initiative would fit into a broader French-German agenda of promoting a

16 Even though the EU ETS is often referred to as the “flagship tool” of EU climate policy, it is currently performing poorly. Oversupply paralyses the market and blocks any meaningful investment signal. Despite recent EU reforms, including the creation of the

“market stability reserve,” the EU ETS it is likely to deliver too little and too late.

gradual alignment of their taxation systems to avoid market distortions, including those in the internal energy market.

3 The coordinated development of renewable energies

A joint strategic vision on the energy transition, more meaningful carbon prices and a commitment to gradually align energy-related taxation policies with decarbonisation goals are additional options for encouraging the joint development of renewables and achieving renewable energy targets at the lowest possible cost to consumers and taxpayers.

Currently, France and Germany are collaborating at the regional and EU levels to improve power market functioning and to better align the design of renewable energy support schemes across Europe to ensure predictability and security for investors. In addition, Germany is gradually opening cross-border competitive tendering for new renewable energy projects in neighbouring Member States, provided an inter-governmental cooperation agreement is in place.

Both countries could commit to moving even further by identifying the most important factors to be aligned for the efficient joint tendering of new renewable capacity. Such an initiative could serve as a stepping stone for deeper regional-level renewable energy cooperation and could be used, say, to develop the vast offshore wind potential.

4 Cooperating in the clean-energy transition of the transport sector

Transforming the transport sector towards clean energy requires a major change of paradigm for all economic actors (consumers, transport providers, manufacturers and the public sector). Close cooperation between France and Germany could facilitate the diffusion of innovative technologies and mobility

solutions, as well as accelerate the creation of a common framework for market competition between actors at the EU level.

In September 2016, Germany and France started a joint initiative on e-mobility and digitization.¹⁷ It aims to foster a closer cooperation with charging infrastructure and the integration of renewable energy into the transport sector. Both countries believe it could also be fruitful for further assessing the environmental effects and benefits of digitalization.

One issue that merits further consideration is the question of how to decarbonize freight transport. In particular, policy makers should discuss strategies for shifting more freight to rail and the potential benefits of catenary trucks and/or other solutions to decarbonise road freight.

Some further ideas for expanding French-German cooperation in the transport transformation include:

- Considering the construction of a joint battery-cell production facility;
- expanding the network of fast-charging stations along French and German motorways and major roads (route nationales, Bundesstraßen) connecting big and medium-sized cities;
- improving interoperability and roaming solutions for charging stations to enhance cross-border mobility;
- initiating a French-German platform of municipalities for the future of sustainable urban transport;
- creating joint projects for field-testing mobility solutions using electric, shared and automated vehicles and for assessing their environmental effects and benefits;
- jointly developing decarbonisation options for aviation.

17 See https://www.bmvi.de/SharedDocs/DE/Anlage/deutsch-franzoesische-erklaerung.pdf?__blob=publicationFile

5 Collaborating in the development of integrated national energy and climate plans (NECPs)

National energy and climate plans (NECPs) are a core element of the new EU climate and energy framework for 2030. The NECPs will be accompanied by long-term decarbonisation strategies and should be consistent with them.

The Commission proposal for an EU Regulation on the governance of the Energy Union states that Member States should consult with their neighbours when drafting NECPs.¹⁸ In the context of the French-German Energy Transition Alliance, both countries should move beyond such mere consultation. Rather, German and French leaders should identify specific topics or sections in their respective NECPs for *joint elaboration* by German and French experts, in close consultation with stakeholders from both countries. These points of elaboration should be noted in the countries' joint strategic vision on energy transition.

Illustrative examples for relevant topics or sections include:

- Joint or collaborative modelling of mid-century net-zero emission strategies;
- short- and medium-term strategies for enhancing power system flexibility;
- pathways for redimensioning existing generating assets;
- geographic and technological priorities for developing renewable energies;
- energy transition initiatives involving French and German municipalities and cities in cross-border regions (deepening the work initiated in the industrial platform supported by ADEME and dena);
- pathways for increasing electrification in transport;
- priorities for public funding in energy transition research and innovation;

- joint lighthouse R&D initiatives in, say, battery storage technologies as well as joint initiatives in industries critical for the energy transition.

Collaboration in the development of NECPs should go beyond government-appointed experts. It should also involve joint sessions of lead parliamentary committees, and it should engage relevant stakeholders from civil society, think tanks and the business sector.

We believe that the collaborative development of specific topics or sections in the French and German NECPs, while no doubt challenging, would generate lasting value. It would enhance mutual understanding and learning and it would improve policy coherence and coordination between Germany and France in areas where both economies and energy systems are closely connected so that choices on one side inevitably interact with and determine choices on the other.

6 An energy transition finance and investment initiative

Since the sovereign bond crisis, the EU public budget balances have improved, and most Eurozone countries now adhere to the general budget deficit limit of 3% of GDP. Nevertheless, economic growth in Europe is still lagging. This is worrying given the investments urgently needed for climate change mitigation and the clean-energy transition. Clearly, the pace and scale of public and private investment in the clean-energy future is currently not in line with the EU's long-term targets. Nevertheless, the clean-energy sectors represent a source of new economic activity and job creation and stand to improve European energy security. For these reasons, investing in the energy transition should be at the core of Europe's growth strategy.

In the short term, the existing European Fund for Strategic Investments ("Juncker Fund") could help to go after some low-hanging fruit such as the roll-out

¹⁸ See COM(2016) 759 final of 30.11.2016.

of charging points for electric vehicles across Europe,¹⁹ especially along highways and in European cities. Financing common-interest renewable projects could also be beneficial, especially in countries where financing represents a significant barrier to their development.

Conclusions: A French-German Energy Transition Alliance to Re-invigorate European Integration

A French-German energy transition alliance built on joint challenges would be of value in and of itself. But given the particular roles and historic responsibilities of Germany and France for the European integration process, the urgency of combating climate change, the availability of low-cost technologies, and the engineering and innovative skills of citizens, researchers and companies in Europe, a French-German energy transition alliance must be at the heart of a joint initiative to re-invigorate the project of European integration.

A political debate on the future of Europe has already started in capitals across the continent and in Brussels. Public movements such as the regular “pulse of Europe” demonstrations are testimony to the fact that despite populist rhetoric the European integration project is very much alive and popular among Europe’s citizenry. A recent survey of public and ‘elite’ attitudes throughout Europe found a remarkable alignment of attitudes around notions of solidarity between citizens in different EU Member States, unexpectedly positive attitudes towards democracy at the EU level, positive attitudes towards the notion of a common European identity and similar views on the EU’s core achievements and main failures.²⁰ The findings indicate that the foundation of values is strong.

Yet whether a French-German energy transition alliance gets traction will depend on the early initiatives taken by new French President Macron and on the outcome of the German election in September 2017. These factors will determine whether a debate on the future of Europe gets traction and which course it might follow: a cautious evolution of existing rules or more fundamental changes to European treaties.

In this context, we suggest that two particular aspects receive priority treatment:

1) Placing the fight against climate change and for an accelerated clean-energy transition at the heart of European institutions.

Steps to this end could include creating the post of a “high commissioner for climate change” who would preside at meetings of climate and energy ministers in the Council of the EU while also leading the Commission’s work in these areas. The high commissioner would regularly report to meetings of EU heads of state and government on the effective integration of climate change and clean-energy transition priorities in the work of EU institutions. It should have responsibility for a dedicated budget that could be financed by national contributions that are based on a minimum tax on CO₂ emissions or a financial transaction tax. The high commissioner would also be tasked with checking all legislative and policy initiatives as well as draft decisions on state aid against their consistency with climate change and energy transition objectives. An important reference point in this regard could be a Union carbon budget up to 2050 as proposed by the European Parliament rapporteurs on the new Energy Union Governance Regulation.

19 See Pellerin-Carlin et al. (2017) “Making the energy transition a European success: tackling the democratic, innovation, financing and social challenges of the Energy union” Jacques Delors Institute, Study n°114.

20 See Raines, Goodwin and Cutts (2017), The Future of Europe: Comparing Public and Elite Attitudes. Chatham House research paper, June 2017.

2) Unlocking the scale and pace of investments needed to combat climate change and bring about a clean-energy transition.

Investment in clean energy infrastructure (renewables, energy-efficient building stock, grids) are capital intensive. As part of a European climate and energy transition initiative, Member States should be encouraged to identify, in collaboration with experts from the European Commission, clean-energy infrastructure investments of national, regional and European importance. Within certain limits, investments in such projects – if wholly or partly financed from borrowed money – would not be counted against Eurozone deficit spending restrictions. The Structural Reform Support Service of the European Commission could play an important role in project selection and implementation. The Commission should also work with stakeholders in the Member States to identify financing strategies for clean-energy priorities set out in national energy and climate plans. Finally, measures laid down in NECPs need to become a key reference point when putting together the annual or multiannual EU budget.



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