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What can EU policy do to support renewable electricity in France?

Oliver Sartor (IDDRI)

ELECTRICITY IS A CRITICAL ELEMENT OF ACHIEVING THE EU'S 2030 RENEWABLE ENERGY TARGETS

Under the 2030 Climate and Energy Package, the European Union has set itself a target of increasing the share of renewable energy from to 27%. Electricity will play a key role in achieving these goals, with the share of renewable power projected to increase to around 47% of the electricity mix by 2030. While electricity is only one part of the energy system, electricity is therefore a vital sub-sector of the EU's renewable energy strategy to 2030.

FRANCE IS A CRITICAL PLAYER FOR MEETING THE EU'S 2030 RENEWABLE ELECTRICITY GOALS

As the second largest energy consumer in Europe, and with relatively ambitious national goals of achieving 32% renewable energy and 40% renewable electricity (RES-E) by 2030, France will be critical to achieving the EU's objectives. As the most interconnected electricity market in Europe, France's approach to renewable electricity will also influence the redesign of electricity markets to cope with higher shares of variable RES-E in its region. Facilitating the efficient deployment and integration of renewable electricity in France is therefore an important sub-chapter of European renewable energy policy going forward.

THE EU CAN FACILITATE THE ACHIEVEMENT OF FRANCE'S RES-E TARGETS IN SEVERAL WAYS

The integration of higher shares of renewable electricity in France is a significant domestic policy challenge. But EU can take a number steps to facilitate the achievement of France's goals. One area where the EU has value added is by ensuring that EU rules for state aid to renewables do not inadvertently become a barrier to cost-efficient deployment of renewables in France. The EU should also push France (and all Member States) to develop a coherent and comprehensive RES-E market integration strategy for 2030 to facilitate national and regional market development. In addition, the EU should push France to improve the quality of its enabling environment for renewable electricity projects, so that it is in line with EU benchmarks.

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Institut du développement durable
et des relations internationales
27, rue Saint-Guillaume
75337 Paris cedex 07 France

SciencesPo

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For more information about this publication, please contact:
Oliver Sartor – oliver.sartor@iddri.org

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KEY POLICY RECOMMENDATIONS

As the 2nd biggest energy consumer in Europe, the strength and ongoing development of the French renewable energy sector is a critical piece of the puzzle for achieving European energy and climate goals for 2030 and 2050. France has made significant progress in developing a small but quickly growing renewable energy sector in recent years. It has also set itself ambitious targets to scale up the share of renewable energy in total final energy consumption to 32% by 2030. Electricity is a critical part of this goal, with the recent Law for Energy Transition and Green Growth setting a goal of 40% of electricity to come from renewables by 2030—up from 17% today.

Achieving these objectives represents a domestic policy and implementation challenge for France. But European policy frameworks can also do a lot to remove potential barriers to France achieving its goals and ensure a favourable enabling environment for achieving France's RES goals. This paper suggests 7 ways that the EU can do so with a focus on the French electricity sector. They focus in particular on what the EU can do as part of the ongoing revision of the European Directive for the promotion of renewable energy ("RES Directive"), on the "new governance mechanism" for implementing the Energy Union, on the revision and implementation of 2014 European State Aid rules for Environment and Energy, and the EU's electricity market design reform package that is being prepared alongside the revised RES Directive.

Key issues from a French perspective are:

1. **Stabilising current European State Aid rules for the post-2020 period and clearly defining essential conditions that should be fulfilled before their eventual removal can be foreseen**. Stabilisation of current rules is important to provide necessary economic incentives for continued RES-E deployment in France beyond 2020, particularly during an extended period of low fossil fuel and carbon prices, which is expected. The current debate on "how soon" to phase out support schemes for which "mature" technologies and when to put certain technologies, like wind and solar, in competition is also somewhat misguided: it is first of all necessary to focus attention on *how to put in place the currently missing conditions* for further market integration and for efficient competition, so as to address the larger challenges that must be confronted if full RES integration into markets is to be possible in the longer term.

2. **Clarifying the interpretation of specific flexibilities within the current state aid guidelines.** Existing state aid rules for environment and energy are currently applied sub-optimally in France due to a combination of uncertainties about the interpretation of the EU's current rules and national government policy decisions to sometimes go further than what new rules require. Increased dialogue and sharing of concrete experiences with implementing the new state aid rules between Member States (and between Member States and the Commission) could also help to improve the quality of implementation. However, further clarification and guidance by the Commission on some key elements of the new rules—prior to requirements for state aid notification—could also help France to minimise total deployments costs and simplify administrative procedures, as long as the existing rules apply.

3. **Maintaining and strengthening key RES Directive provisions on the project enabling environment in the Member States. To improve on the experience of these provisions in the current RES Directive, the EU should improve reporting, monitoring and dialogue with Member**

States on these measures, including through a small set of indicators. This is especially relevant in France with regard to: project delays, network access barriers, cost transparency and potential cost-sharing, minimising the cost of project finance, reducing excessive administrative burden and delays in authorization, the availability of public lands for RES projects, and the stability of the regulatory environment. These issues are very important for France, where project financing costs are several percentage points higher than in neighbouring Germany, and wind projects often take 7 to 8 years to complete due to a range of administrative inefficiencies and related factors.

4. **Requiring Member States to develop a comprehensive and coherent RES-E integration and market flexibilisation strategy as part of their National Climate and Energy Plans.** This would be extremely helpful to provide for a coherent, non-discriminatory and longer-term strategic approach to RES integration in France and to provide needed visibility for France regarding the strategies of other neighbouring Member States. This strategy could be based on guiding principles that ensure RES-friendly and non-discriminatory integration into electricity markets. It could ensure a full consideration of various flexibility, infrastructure, market design and security of supply options to void "silo thinking". It should be outlined in a significant and dedicated section of their new 2030 National Climate and Energy Plans, based on a specific list of questions in the planning template and that are listed in the new RES Directive as new requirements for Member States to respond to.

5. **Providing much-needed direction on the *process* of regional electricity market cooperation, as envisaged by the EU's new Energy Union governance mechanism**. This is important to ensure that the new regional cooperation framework addresses strategically important issues for RES-E integration in France's region(s), which is strongly in France's interest if it is to achieve its high variable RES-E targets in 2030. Strong guidance on the process could also ensure effective stakeholder participation and that the process is backed by an appropriate political mandate from national governments, both of which are essential.

6. **Avoiding prematurely harmonising national support schemes for renewable energy before the appropriate conditions for a common market in RES-E are in place in Member States like France**. While some Member States may be ready to contemplate a broader opening of their support schemes, France is not yet at this stage of development of its RES sector. Forcing Member States with still relatively small RES sectors to fully open up support schemes would likely be economically and politically counterproductive in the French context for the foreseeable future. A broader approach, taking account of Member States different starting points and a larger set of long run market integration issues for RES-E, should be preferred.

7. **Ensuring that the EU's 2030 RES targets are achieved and longer term RES deployment momentum is created.** This is important for France because its ambitious targets will not be achieved in a political vacuum. Steady progress on RES deployment and integration goals beyond its frontiers will be essential to maintaining momentum for these objectives domestically. A "gap-filler" mechanism to achieve the 2030 EU RES goals is only part of this story. The EU should also aim to make better use of enabling measures in the RES Directive, and associated planning and reporting requirements under the new Energy Governance Mechanism, to **identify the major current bottlenecks to RES deployment in Member States**. **It should then seek to deploy the EU's institutional and financial capacity to address these bottlenecks where they exist, together with the Member States. An approach focusing on the broader health of RES in the different Member States is required.**

1. INTRODUCTION

One of the successful elements of Europe's 2020 Climate and Energy Package to date has been the take-off of renewable energy sources (RES). The share of RES in EU total final energy consumption has climbed from 8.3% in 2004 to 15% in 2013 (Eurostat, n.d.). However, much of the EU's policy framework which has helped to drive RES under the 2020 Package is currently up for revision. Getting these revisions right will be crucial for the development of renewable energy in the Member States beyond 2020 and thus for whether the EU's broader energy transition goals by mid-century are achievable. As part of this process, the European Council has agreed on an "EU binding" target of 27% in 2030. Achieving this target could imply increasing the share of renewable electricity (RES-E) including hydropower to around 47% by 2030, up from around 25% in 2013 (European Commission, 2014b).

It is also clear that the nature of European governance to promote renewables will change significantly from 2020 onwards. In the 2020 Package, the EU has governed RES to a large extent in its capacity to set legally binding targets for Member States to achieve (i.e. via the RED). Post-2020, the role of the EU as a target setter will be shared to a greater degree with the Member States, who will set their own national RES targets under National Climate and Energy Plans, subject to the condition that these targets sum up to the EU's combined RES targets.

Nevertheless, while this involves a somewhat less centralised approach to the setting of RES targets, the EU will continue to have a significant role in promoting renewable energy as an *enabler* and *coordinator* of renewable energy development and market integration. There are a number of crucial areas where Europe can contribute value added to the development of RES in the Member States beyond 2020.

This paper attempts to highlight these areas using the concrete example of the renewable electricity sector in France. As the 2nd largest electricity consumer in Europe after Germany, and as a highly interconnected country (with an average of 16GW of export capacity with 6 neighbouring countries) an assessment of what is needed to develop RES-E in France is a critical question for European policy.

The focus of this paper is placed on the electricity sector for several reasons. Firstly, electricity is currently a major focus of the EU's policy development efforts with respect to renewable energy, with the revised Renewable Energy Directive being prepared alongside the EU's electricity market design initiative and a regional electricity market cooperation guidance document. Second, a revision of state aid guidelines (which have tended to focus in particular on the rules for renewable electricity in recent times) is also expected to begin in 2017 and this has important implications for France and especially for RES-E projects. Thirdly, given the European nature of power markets, renewable electricity is an area of strong European relevance and competence. Finally, given the number and complexity of the issues relating to the electricity sector alone, it was decided to limit the scope of the paper to RES-E to give full attention to one sector, rather than spreading the focus too thinly across three sectors of power, heating and transport. Future work will focus on the transport and heating and cooling sectors.

This paper argues that France has ambitious RES-E targets for 2030 (40% of final electricity consumption) and is in the process of developing and improving its domestic policy frameworks for implementing them. However, the broader EU policy framework for RES-E still remains extremely

important for France. On the one hand, the EU can help to remove potential EU-level barriers to France achieving its domestic RES-E goals. On the other, the EU can also play a role to ensure that the enabling conditions for renewable electricity in France are adequate to the EU's collective decarbonisation and renewable energy ambitions.

The discussion of this paper suggests 7 main ways that the EU can have value added to promote renewable electricity in France in the post-2020 period. These are:

1. Stabilising current European State Aid rules for the post-2020 period and clearly defining—in the RES Directive and future State Aid Guidelines—essential conditions that must be fulfilled for their removal to be justified.

2. Clarifying the interpretation of specific flexibilities within the current state aid guidelines to allow Member States and sharing newly gained experiences on implementation of the rules over the coming year or two.

3. Strengthening reporting on and better policing provisions of the RES Directive on the project enabling environment, especially as they relate to administrative burden, project delays, network access barriers and cost transparency, access to low-cost finance, stability of the regulatory environment and access to public lands for deployment.

4. Requiring Member States to dedicate a section of their new 2030 National Climate and Energy Plans to outlining a comprehensive and coherent RES-E integration strategy, based on guiding principles that ensure RES-friendly and non-discriminatory integration into electricity markets.

5. Providing much-needed direction on the *process* of regional electricity market cooperation, as envisaged by the EU's new Energy Union governance mechanism, to ensure it addresses strategically important issues for RES-E integration.

6. Avoiding premature attempts to force Member States to harmonise their support schemes for renewable energy before the appropriate conditions for a common market in RES-E are in place.

7. Ensuring that the EU's 2030 RES targets are achieved, especially by better monitoring of key provisions in the RES Directive and by better deploying the EU's financial and institutional capacity to address the major current bottlenecks to RES deployment in Member States.

The content of this paper was informed by a series of approximately 20 detailed interviews with a variety of stakeholders in the development of renewable energy in the power sector in France.[1]

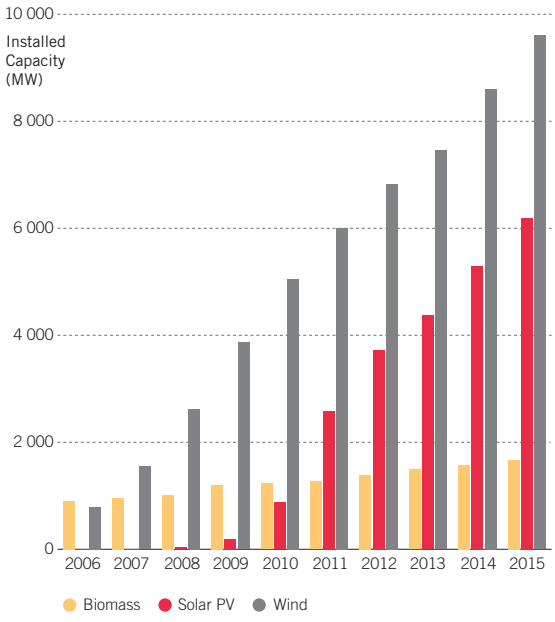
2. THE STATE OF RENEWABLE ELECTRICITY DEPLOYMENT IN FRANCE

2.1. Recent progress

France has begun to make significant progress in deploying renewable energy sources in recent years. Since 2005, France has seen the share of renewable energy in its energy mix grow from around 9% of Gross Final Energy Consumption to around 15% in 2014.[2] This result has been driven by growth in three key parts of the energy system, with the electricity sector making a significant contribution by rising from 13.8 to 17% during this time:[3]

- Electricity: from 13,8% to 17%
- Heating and cooling: from 12% to 18%
- Transport: from 2% to 7%

Figure 1. Installed capacity of renewable electricity sources in France (excluding hydro)



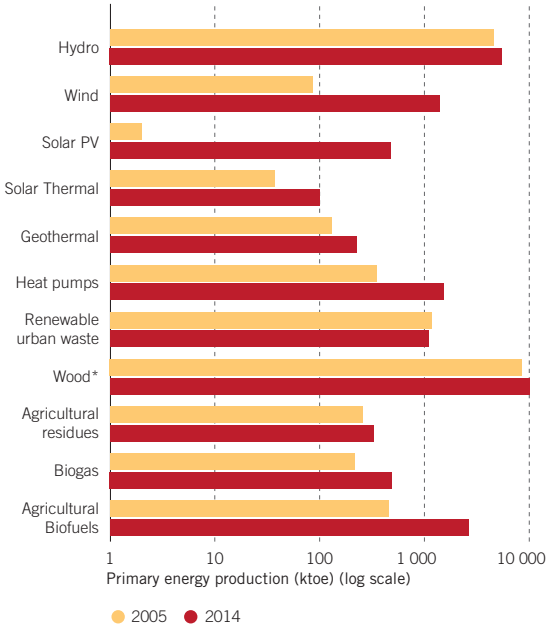
Source: IDDRI, Enerdata, SER.

Beyond electricity, France has also begun to develop a broad portfolio of renewable energy technologies (Figure 2). The fastest growth rates have been

1. These actors included project developers, public and private financial institutions, industry associations, NGOs, independent agencies for the promotion of renewable energy in France, researchers, and public officials at local and national level. It also based on desktop literature review and data analysis of French renewables progress to date and policy.
2. IDDRI estimates for 2014 based on data from the Ministry for Ecology, Sustainable Development, and Energy and Eurostat.
3. Data from DG Energy and based on 2013 levels (2014 data was not available).

seen in wind and solar PV, in part because they have started from a low base in absolute terms. However, significant progress has also been seen in the area of solar thermal, heat pumps, biogas, and agricultural biofuels.

Figure 2. Growth of production from renewable energy sources in France (2005 - 2014)*



Source: IDDRI, using data from DGEC, 2015
*Note: the vertical axis uses a log scale to facilitate comparison of growth rates across sectors at very different absolute levels of production

France's system of feed-in-tariffs for renewable electricity has also proved relatively cost-efficient according to cross country comparisons. For instance, Ragwitz et al (2011) finds that as of 2010 France's support payments to onshore wind projects led to profitability rates for generators that were among the lowest in Europe, beaten only by Austria, Luxembourg and Germany. France has also proved quite reactive to falling deployment costs, especially for solar PV, and shifted to a rolling review system for solar PV tariffs in early 2011, after it became clear that deployment costs were falling rapidly.

France also has a number of policies that seek to incentivise the uptake of renewable energy sources in buildings, including solar PV. For example, energy performance standards for new buildings in France's 2012 Regulation Thermique set maximum standards of 50 KW/m2 (primary energy) for building built until 2020 and which require at least 5 KW/m2 of renewable energy.

Large unexploited potentials for renewable energy remain in the French power sector. A recent report suggested that France could probably manage a transition to a 100% renewable energy mix in electricity sector from a technical and economical perspective (ADEME, 2015).

2.2. Moving off track?

Nevertheless, France still faces a significant challenge to meet its national targets for 2020 and 2030. Under the EU's Directive for the Promotion of Renewable Energy Sources of 2009 ("RED") France has a target of supply 23% of gross final energy consumption from renewables by 2020. As Figure 3 shows, France had begun to fall below its intended trajectory to meet this target.[4] As can be seen from Figure 4, France has been falling behind its objectives in heating and cooling, transport and electricity.

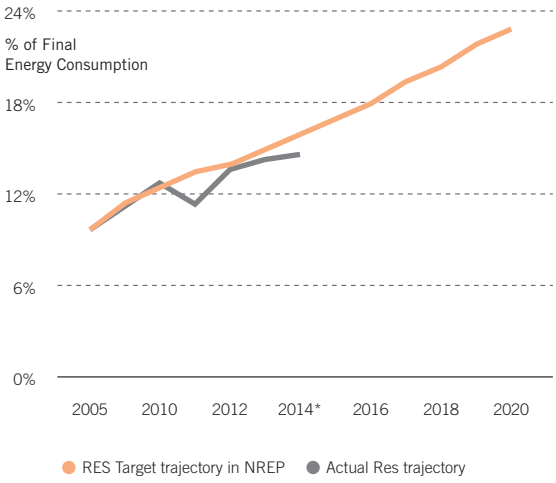
In the case of the renewable electricity sub-target, key factors in slowing deployment has been: an unstable regulatory environment resulting in uneven deployment rates (see Figure 5); excessive project delays due to a high and unstable administrative burden, strong public opposition, slow network connection; and, more generally, and an apparently insufficient prioritisation of the RES objectives within its policy-making framework. These issues are discussed further in Section 3. As can be seen from Figure 5, in recent years declining regulatory uncertainty has begun to see deployment rates of onshore wind and solar pick up again. However, rates of onshore wind remain below the ~1.7 GW per year necessary to achieve the level of deployment that is contained in France's National Renewable Energy Action Plan.

2030 goals

Looking beyond 2020, France recently passed a very ambitious national law called the "National Law for Energy Transition and Green Growth".[5] This law includes a target to have renewable energy sources supply 32% of gross final energy consumption in France by 2030. This includes a target of 40% RES as a share of electricity consumption. Alongside this increase in renewables, the law also sets a target to reduce the share of nuclear power in final electricity consumption from roughly 75% today to a maximum of 50% by 2025, and it

4. To be fair, these results are not climate corrected, and 2014's result (like that of 2011) is in part due to unusually warm weather than reduced demand for wood heating, and a small drop in hydropower output. But Figure 3 shows that even if one takes 2013 data and looks across the board at electricity, heating and transport, France is nevertheless starting to fall slightly behind its intended trajectory in all three categories of RES deployment.
5. « Loi n°2015-992 du 17 août 2015 relative à la transition énergétique pour la croissance verte »

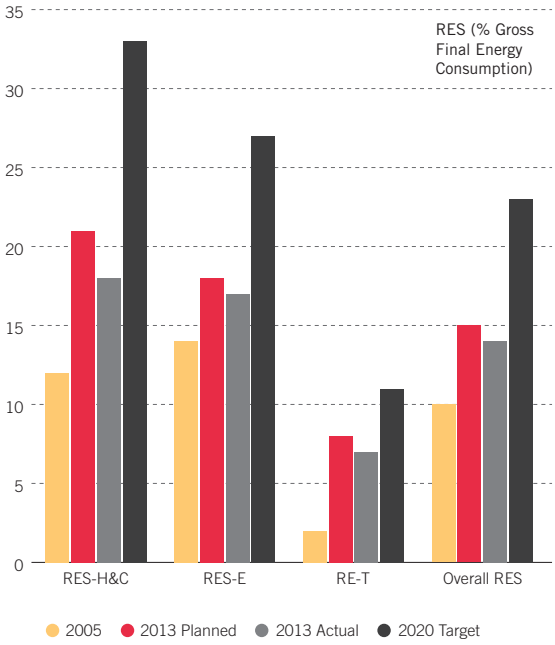
Figure 3. RES deployment vs 2020 target trajectory



Source: IDDRI, France revised NREAP 2009.

*Actual RES share in 2014 is a provisional estimate based on IDDRI calculations and data from Enerdata and MEDDE

Figure 4. RES Deployment in France by sector



Source: IDDRI, European Commission data, French revised NREAP 2009

Figure 5. Regulatory changes and uneven deployment rates of RES-E in France

Source: IDDRI, Enerdata, SER.

contains ambitious energy efficiency objectives to reduce final energy consumption by 22% by 2030 vs 2012 levels.

The level of deployment needed to achieving France's 2030 targets for renewable energy will thus depend to a large extent on the interactions between the targets on energy efficiency, nuclear power, and renewables deployment itself (Rüdinger, 2016). Nevertheless, it seems likely that France's 2030 objectives for RES will be challenging to meet unless there is a significant shift in the current trajectory of deployment.

Bringing about this "shift in trajectory" will require the removal of a number of emerging barriers which have begun to hinder the efficient deployment renewables in France, especially in the electricity sector. These barriers are therefore discussed in the following Section, with a focus on those which are most relevant to European policy frameworks in the 2030 Climate and Energy Package and the revision of the EU's Renewable Energy Directive in particular.

3. BARRIERS TO RES-E DEPLOYMENT IN FRANCE & IMPLICATIONS FOR EU POLICY

3.1. Stabilising and clarifying state aid rules for the post-2020 period

In 2014 European Union State Aid[6] Guidelines for Energy and Environment significantly tightened the rules that Member States had to apply in the design of renewable energy support schemes from 2016 and 2017 onwards. These rules have now been legally transposed in a reform of French renewable support mechanisms (for a full discussion see Mathieu et al (2016)). Stakeholders in France have different attitudes towards the general direction taken by these guidelines, and some actors expect to be more negatively affected than others. However, interviews with French stakeholders identified two broad concerns that are common across the sector.

Before presenting these concerns, however, it is worth clarifying why such support schemes for renewable energy exist in the first place. One reason for support schemes is that they help to correct for the lack of an effective inclusion of the CO2 externality cost in markets for energy. As long as the CO2 externality cost is not appropriately priced into market prices, the incremental costs of renewable energy technologies cannot be compensated by the market alone. Secondly, there is a time constraint with respect to the need to develop and inject renewable energy into energy markets to achieve ambitious climate mitigation objectives. In this context, deployment rates are likely to need to move faster than natural retirement rates of existing high carbon capacity. The consequence of this can be downward pressure on market prices in the short run as "excess" capacity is created by the need to turn over the capital stock quickly.

A third reason is that these are often capital intensive investments that require a sure financial revenue stream to be financed. This in turn typically calls for some kind of long term contractual arrangement, which many support schemes currently provide. Finally, there is a need for innovation in low carbon technologies in which declining marginal costs, knowledge spillovers and systems learning may justify starting with higher cost abatement options first. These underlying rationales for support schemes are useful to bear in mind in what follows below.

3.1.1. The speed of phase out of existing support scheme rules: the necessary conditions need to be in place first

A first major concern of French stakeholders relates to the speed with which the Commission appears to attempting to move a technologically neutral, "market-based" approach to supporting renewable energy technologies. For instance, paragraph 108 of Article 3.3.1 of the EU's 2014 State Aid Guidelines states:

> *"These Guidelines apply to the period up to 2020. However, they should prepare the ground for achieving the objectives set in the 2030 Framework. Notably, it is expected that in the period between 2020 and 2030 established renewable energy sources will become grid-competitive, implying that subsidies and exemptions from balancing responsibilities should be phased out in a degressive way. These Guidelines are consistent with that objective and will ensure the transition to a cost-effective delivery through market-based mechanisms."*

Both project developers and public and private financial institutions involved in the financing of RES projects in France expressed strong scepticism about this objective. They note that, in a French context, a "technologically neutral" approach to deployment based on market mechanisms could prove less cost-efficient than expected because the static economic efficiency gains of short term auction results will not necessarily coincide with the dynamic economic efficiency of having a diversified portfolio of technologies and well developed domestic value chains. This argument can of course be taken too far. However, it appears justified in the current French context, where the size of market for vRES technologies is still relatively small (around 7% of total electricity consumption for instance), and where significant cost has been spent on developing domestic value chains and local expertise. In this relatively small market, a technologically neutral approach to supporting technologies could easily see, for instance, onshore wind almost completely crowd out and potentially kill off other technologies (like offshore wind, solar PV, biomass) that are presently more expensive in many instances, but which in the medium to longer term will be necessary to achieve higher shares of RES-E in France (ADEME, 2015).

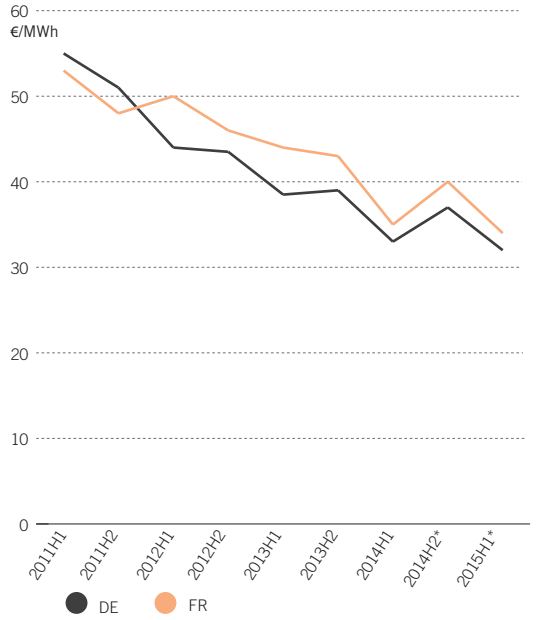
6. In EU law, "state aid" refers to any advantage that is given by a government to an undertaking given on a selective basis and where competition of EU trade may be affected. In the context of renewable energy in France, this relates mainly to the design of economic support policies for RES technologies, their method of allocation, although state aid can also refer to other issues relevant to renewables like the possibility of long term contracting, participation in capacity markets, etc.

Moreover, it should not be forgotten that a broader portfolio can also provide other complementary system services (e.g. in terms of complementary load profiles to reduce overall intermittency and thus reduce flexible generation and storage needs). For instance, studies often find that the diurnal production pattern of solar power is well suited to natural load changes, while wind power, which can have higher load factors during the early morning and evening, helps to complement solar's lack of output during the night (NREL, 2010, ADEME 2015, RTE 2014). This means that technologies like onshore wind and solar are not necessarily perfect substitutes in developing renewable electricity France. Thus, as these complementary "system services" of different technologies are not currently priced by the French electricity market, this means that direct competition for deployment of capacity of RES-E may not necessarily lead to the globally least cost portfolio of deployment.

A number of other factors also suggest that the economic basis for investment in RES projects, even in relatively mature technologies, is unlikely to exist in the French context from 2020 if not well into the 2020s. Electricity and heating prices have been falling significantly in France due an accumulation of factors: the "merit order" effect of low marginal cost renewable energy penetration, electricity market overcapacity (see Figure 6), significant and potentially enduring long-term falls in primary energy prices (see Figure 7), very low carbon prices in the EU carbon market,[7] and still relatively low carbon taxes outside the ETS in France. These conditions have been making price parity a significantly more challenging target for RES projects in France.

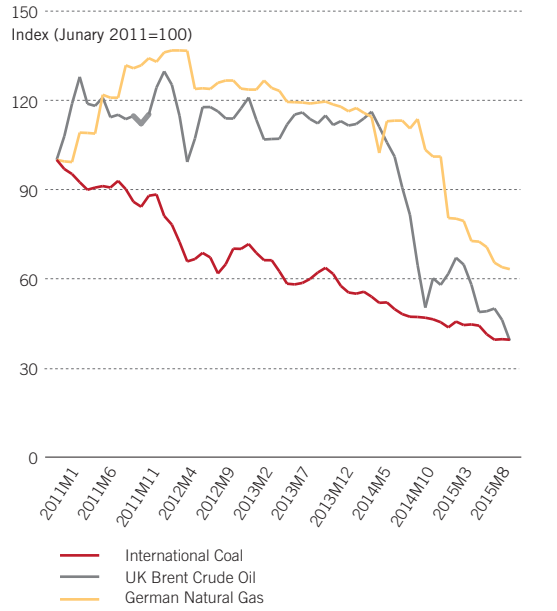
However, even if these conditions change, project developers and financers in France note that other conditions relating to the broader power market design will also need to be in place to make maturing renewable energy technology projects "bankable". In particular, they note that the combination of high capital intensity of RES-E projects and the riskiness created by a floating electricity or gas price would oblige project developers to enter into long term contacts with a power off-taker to make projects bankable with the financial sector. However, recent decisions by the European Court of Justice have created significant uncertainties about the conditions under which such long term contracts would be legal under EU law.[8] Moreo-

Figure 6. Semi-annual average wholesale power prices (FR and DE)



Data: www.tennet.eu; DG Energy (2015q3) quarterly report on European electricity markets

Figure 7. EU reference fossil fuel prices (coal, gas, oil)



Data: IMF Commodity price database

7. As of February 1, 2016, December delivery EUA (carbon allowance) prices were trading at 5.85€/tCO_2eq, roughly equivalent to 5,20€/MWh of coal fired electricity.

8. Cf. for instance the 2008 case in relation to Distrigas and other cases in relation to EDF and EXELTIUM in 2009.

ver, even if a significant share of the French power market could pass onto long term contracting arrangements, a short term spot market that reliably reflected both long term "scarcity" prices and the CO_2 externality cost would need to exist as well. Actors in France therefore question the logic of the Commission's attempt to remove relatively well-functioning existing support mechanisms until they have greater confidence that these broader conditions are likely to be in place.

3.1.2. Applying the existing rules cost-effectively

Stakeholders in France express concern that the French authorities have tended to sometimes provide an overly strict or excessively limiting interpretation of current EU state aid rules. Sometimes this appears to result from a lack of clarity for the national authorities.

For instance, in the electricity sector, there is a strong concern that the broad application of tendering practices will significantly increase the cost and risk involved in small and medium scale projects. For instance, clearing prices in recent French tenders for small scale solar PV projects were around 40€/MWh higher than equivalent feed-in-tariffs for similar scale projects in neighbouring and less sunny Germany (Rudinger, 2016), strongly suggesting that the transaction costs of calls for tender for smaller projects outweigh the benefits. Project developers are concerned that the tendering process will add additional project delays (estimated to be up to 10 months by some developers who were interviewed), which is an additional transaction cost. There is also fear that uniform tendering will adversely affect the development of projects by local governments or smaller communities, who have much greater trouble in supporting the risks of participating in a single call for tender on a one-off basis.[9]

In such cases, there are strong arguments for greater use of the potential derogations that are foreseen by the EU guidelines from the tendering principle. These are foreseen by the current Guidelines. For instance, paragraph 125 states:

> *"Aid is granted in a competitive bidding process on the basis of clear, transparent and non-discriminatory criteria (66), unless:*
>
> *(a) Member States demonstrate that only one or a very limited number of projects or sites could be eligible; or*
>
> *(b) Member States demonstrate that a competitive bidding process would lead to higher support levels (for example to avoid strategic bidding); or*
>
> *(c) Member States demonstrate that a competitive bidding process would result in low project realisation rates (avoid underbidding)."*

However, the application of these derogations—at least as suggested by the emerging French policy framework for implementing the new EU state aid guidelines—has been limited and seems likely to be inefficient in France.

There appear to be two reasons for this. Firstly, in some cases the French government appears to have chosen to interpret the EU state aid rules in a manner that is more restrictive than what they actually require. For instance, the EU rules requires solar PV to use calls for tender once installations are larger than 500 KW, however France applies calls for tender to projects from a threshold of 250 KW. The additional transactions costs involved in responding to calls for tender appear to clearly outweigh the efficiency benefit from placing developers in competition. For instance, smaller projects in this category (such as solar installations on buildings) had an average price of 130 to 140€/MWh in late 2015, which is significantly higher than similar scale projects that are allocated under feed-in-tariffs in Germany (Rudinger, 2016). This kind of result poses a longer term risk of unnecessary inflating the total cumulative support costs for renewables projects in France.

Secondly, the French government claims that it faces a challenging task of wanting to make use of the above-cited derogations in state aid rules, while not knowing whether its interpretation of the Guidelines in specific cases is in line with that of the Commission ex ante. For instance, what qualifies in practice as an acceptable ex ante case that a tendering process for smaller scale solar or wind projects "would [be expected to] lead to higher support costs"?

Similarly, Article 127 of the Guidelines states that:

> *"Aid may be granted without a competitive bidding process as described in paragraph (126) to installations with an installed electricity capacity of less than 1 MW, or demonstration projects, except for electricity from wind energy, for installations with an installed electricity capacity of up to 6 MW or 6 generation units."*

The intention of this paragraph is apparently to ensure that only large scale industrial sites are made to compete under calls for tender, to avoid unnecessary transaction costs. However, it is unclear from

9. In its recent decree on the new Solar PV tendering process, the French government attempted to address this by allowing additional payments of +3€/MWh for so-called "projets participatifs". While the attention to such projects is well-warranted, in practice project developers are skeptical about how efficiently this system will work and whether a two track approach would be better. For instance, how will public participation rules be verified and policed in practice to avoid all projects exploiting loopholes to take advantage of the special measure?

the Guidelines how to interpret the rule. In particular, if the threshold is 6 MW or 6 generation units, how large may each generation unit be if the latter threshold is applied? This author has been given to understand that each of the 6 generation units can be of up to 3 MW of rated capacity each, making for a threshold of up to 18MW that can be exempted for wind projects. However this is not clear from the EU's guidelines themselves, which suggest a threshold of 6MW as a possible interpretation.

According to the French government, these uncertainties cannot be resolved simply by learning from precedent. A breach of EU aid guidelines can involve a requirement that the project recipients reimburse all of the disallowed aid received. There is therefore a strong incentive for Member States like France to err on the side of caution and apply them conservatively rather than to create new precedents. For its part, the Commission notes that French authorities could seek direct advice earlier in the process of developing national policies, for instance at the point where eligible state aid policy is notified to the Commission. However, discussions with both actors (the French Ministry and the Commission) in the process of preparing this report suggested that, in practice, this process of dialogue between the relevant Commission authorities and French authorities appeared to be functioning poorly or to have broken down into a conflictual rather than cooperative relationship.

3.1.3. What role for European policy?

The EU should clearly signal to investors that it intends to keep the current State Aid rules for RES more or less intact beyond 2020 until a number of essential conditions for RES-E integration are met. A very credible way of doing this could be for the EU to enshrine key principles and provisions of the current State Aid Guidelines for RES into the RES Directive for the post-2020 period. This would help to provide much needed stability for investors—a crucial issue in France—as the current State Aid guidelines expire in 2020.

The key principles and provisions enshrined in the Directive, building on the existing Guidelines, could include a statement that Member States **can continue to put in place support schemes for RES technologies in the period 2020-2030 or until such time as the market failures justifying the need for a state support schemes have been fully corrected**.

Specific market failures or preconditions for the removal of support schemes could be cited, such as:

- The need for full and bankable pricing of CO_2 externalities;
- The need for a mechanism that effectively signals scarcity of low carbon electricity generation capacity in national electricity markets, despite potential surplus generation capacity;
- That the necessary conditions are in place to allow for capital intensive technologies to find financing and to be able do so at reasonable and competitive rates;
- The need for markets that provide explicit incentives for complementary system services that can be fulfilled by complementary mixes of renewable energy technologies.

The EU should then seek to ensure, via related policy processes, that these conditions are gradually put in place by Member States and within EU policy.

In addition, during the transition away from support schemes to market-based supports, the French landscape suggests that it is important that three additional principles be respected:

- That the removal or phase out of technology specific support schemes would not lead to a short-sighted privileging of static cost effectiveness considerations over dynamic cost-effectiveness for the transition as a whole, e.g. by favouring one cheaper technology only at the expense developing or maintaining domestic value chains for complementary technologies that are expected be necessary to deploy in the near future or as a part of an optimal system-services portfolio.
- That the application of competitive bidding processes should be avoided where it can be reasonably expected that they would lead to higher support levels or reduced project realisation rates, e.g. by increasing administrative and transaction costs for small projects or by inadvertently reducing the ability of local scale actors to develop medium scale projects which are important for the public acceptability of renewable energy.
- That continuing possibility for ad hoc measures to promote promising innovative and immature technologies is maintained.

In the meantime, further effort is also required by the EU to ensure that national governments do not inadvertently create unnecessary barriers to RES deployment by failing to fully exploit the flexibility of the current Guidelines where they should be exploited to reduce policy costs. Options for doing so could include the Commission issuing detailed technical guidance on "frequently asked questions" and recurring themes that Member States are confronted with in practice. However, technical guidance cannot cover all permutations

of national policies or situations. Thus, greater effort appears to be needed to strengthen the relationship between the Commission's competition arm and Member States like France to foster a more cooperative approach to applying the flexibilities within the existing rules.

To increase learning from experience in the lead up to the revision of the current guidelines, and to share information between Member States on best practices using concrete cases, informal workshops with policy makers from the Member States to discuss the experience of how current revisions to state aid have been implemented and key issues that have arisen may be worth pursuing.

3.2. Ensuring a comprehensive and coherent approach to RES integration

3.2.1. RES integration at the national level

Another potentially important barrier to the cost-effective achievement of France's 2030 renewable energy targets is the current lack of a comprehensive and coherent strategy for integrating large shares of intermittent renewables into the French and European power market. To be fair, this partly reflects the fact that France's 2030 RES-E target was only signed into law in July 2015 and a new Multi-annual energy planning system is in the process of being established.[10]

Nevertheless, the current the lack of a comprehensive and coherent renewables integration strategy has already begun to create contradictions and uncertainties which will need to be addressed. For instance, in the discussion of RES-E integration during the recent redesign of French support mechanisms, there was a very strong focus on the need to limit negative power prices by providing for curtailment of RES technologies. However, this focus distracted from the broader and more strategic question of how to ensure that curtailment of RES is efficiently combined with other market flexibilisation instruments over the longer term. Even within the narrower framework of how to incentivise RES curtailment per se, this debate still failed to tackle the need to ensure remote control of RES-E sites by project aggregators—a basic pre-condition for an effective participation of RES operators in the balancing market. Such oversights highlight the need for an integrated rather than an ad hoc approach, and one which is implemented with appropriate time and care.

10. This refers to the Programmation Pluriannuelle de l'Energie : http://www.developpement-durable.gouv.fr/Programmation-pluriannuelle-de-l.html

The need for a comprehensive strategy to RES-E integration is also increasingly evident if one considers the number of as yet unresolved, but vital, questions for successful RES-E integration in France:

- What are France's 2030 power demand projections and their implications for the actual investment capacity that is expected to be required to achieve France's 2030 RES-E targets?
- How will the system be "flexibilised" to ensure security of supply and cost-effectively balance supply and demand?
- What will be the role of different technical levers (demand, market coupling, optimising grid and interconnections infrastructure, storage, etc.) in providing that system flexibility?
- How will RES-E projects that provide additional system services be appropriately remunerated for the provision of those system services?
- What broader changes to the French power market design (and its integration with regional markets) are needed to cost-effectively integrate RES technologies into the market?
- What is the role auto-consumption of RES and how will key integration issues such as payment of grid and renewable support scheme costs by auto-consumers, and their role in managing peak power demand periods, be tackled?

This number of issues that need to be addressed, the interactions between them, and the need to take national specificities into account, highlight the limitations of attempting to address market integration via the narrow European instrument of State Aid Guideline or even the current Market Design Reform initiative (even if it can provide useful guidance on some issues). Member States also need to develop their own strategies based on their very different starting points in terms of existing power market arrangements and be able to do so in cooperation with their regional neighbours.

This does not mean that national governments should be allowed to do whatever they like in their RES-E integration strategies. There is also a need for the EU to ensure to that national governments develop credible and coherent strategies, that these strategies do not inadvertently create barriers to RES deployment and that they are developed together with regional neighbours. Thus, clear guidance on how to do this from the EU is also required.

3.2.2. What role for European policy?

Both the revised RES Directive and the new Energy Union governance mechanism should require Member States to develop detailed national RES integration plans. The central purpose of these

"integration strategies" would be threefold:

a) to ensure that Member States are forced to develop relatively comprehensive and coherent RES integration strategies, taking into account all the potential levers to improve integration;

b) to ensure that Member States respect certain principles of RES-friendly market integration in their strategies;

c) to provide a concrete basis for regional cooperation on electricity market integration and market design, as envisaged by the EU's new Energy Union Governance Mechanism.

To limit administrative double up, the key details of the plans that are reported at EU level could be housed within a dedicated section of the new Energy Union planning and reporting template (i.e. the new National Climate and Energy Plans that are currently being developed). They should be allocated a significant section of these plans, or if space does not allow, in a separate requirement under new RES legislation. The integration strategies should be required to include, at a minimum, a detailed response to the list of issues mentioned in the proceeding subsection. This should be ensured by a relatively strict template for Member States to fill out that responds to each of the questions.

To ensure that Member States are legally required to undertake the development of these strategies and to make coherent with the integration principles outlined in the RES Directive, these strategies should be a specific requirement of the RES Directive.

The EU's role would be to ensure that this section of the National Plans were completed, were internally consistent, were transparent, were shared with regional neighbours. This is likely to be best assured by common template for national climate and energy plans that requires Member States to provide detailed responses to each of the above questions. Note that requiring all Member States to complete this information in their national plans would not necessarily imply that they were being asked to pursue a specific amount of renewable electricity in their national strategy (a sensitive political point for Member States). Rather, it would simply imply that, to the extent that renewable electricity is an element of their decarbonisation strategy, Member States were required to reflect on and outline how they intend to ensure cost-effective integration.

The elaboration of the integration strategies should also need to respect a small set of key guiding principles for good practice integration that would be defined in the RES Directive. Such principles could include, for example, that:

- Integration strategies must not include elements that unfairly or arbitrarily discriminate against RES-E technologies and/or new market entrants (e.g. through excessive complexity or transactions costs).
- The burden of flexibilising the power market must not be borne exclusively by curtailment of RES-E generation, but should seek to create technologically neutral incentives to pursue a cost-effective mix of participation from all technologies depending on which alternatives offer least cost flexibility solutions.
- Integration strategies should privilege not only short term but also the development of long-term solutions that are necessary for developing higher shares of vRES in European electricity markets.
- Key elements of integration strategies considered should include: removing excess and inflexible capacity, optimising grid use, improving locational price signals, interconnections, reforms to peak pricing rules, the role of demand side participation and storage in price formation;
- RES technologies should not be excluded from fully participating in ancillary service markets;

3.2.3. RES-E integration and cooperation at the regional level

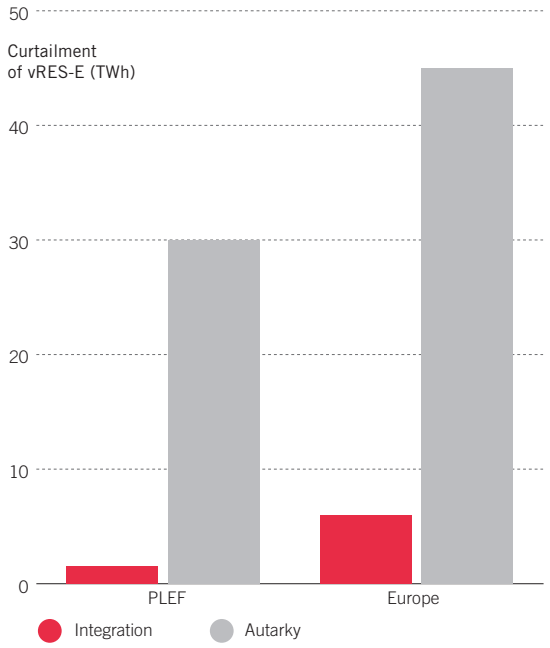
The issue of RES-E integration obviously also extends beyond France's national borders. Greater integration of France's electricity market with those of its regional neighbours will become increasingly important to help France cost-effectively ensure system reliability and security of supply despite the intermittency of renewable electricity sources (Agora Energiewende, 2015). Tighter market integration also offers potentially significant cost-savings for consumers (and export revenues for producers) in France, through better exploitation of opportunities to trade electricity across borders (Notre Europe, 2015). For instance, to achieve high shares of renewables penetration domestically, France is expected to need to rely on higher imports of solar electricity during the day, but to stand to benefit from exporting higher shares of wind during the night (ADEME, 2015).

These are not just economic concerns—sustaining public and political support for the achievement of ambitious RES targets also requires managing the overall systemic costs of RES integration as well as possible.

France has already begun to make important progress on enhancing cooperation in electricity markets with its regional neighbours. It has been engaged in the Penta-lateral Electricity Forum (PLEF), which in turn has played a key role in coupling day-ahead markets in Northwestern Europe. France has also recently begun an interconnection

project with Spain to effectively double interconnection capacity with (the very poorly interconnected) Iberian Peninsula.

Figure 8. Estimated curtailment of vRES production under autarky vs increased power market integration



Source: Agora Energiewende, 2015

Note: PLEF refers to the penta-lateral energy forum countries, which are Austria, Belgium, France, Germany, Luxembourg, Netherlands (with Switzerland an observer).

Nevertheless, if one takes France's 2030 RES-E penetration targets seriously, then a significant amount of work remains to be done. In terms of hard infrastructure, a recent assessment of key infrastructure priorities by ENTSO-E for the South-western and Central western region of Europe, suggested that while France currently identifies around 6 GW worth of priority interconnection projects, the optimal range suggested by the scenarios could be closer to 7 to 10 GW (ENTSO-E, 2014). Higher targets become more relevant in the higher RES-penetration (and higher demand) scenarios. Meanwhile, the Pentalateral Energy Forum itself identifies a number of unfinished priorities relating to regional electricity market institutional "software" that are relevant to integrating existing shares of renewable energy. Coupling of intra-day markets, improving market flexibility to cope with higher shares of intermittent generation and developing a basis for regional-based approach to ensuring capacity adequacy are among key priorities identified in its current work program.[11]

11. Presentation of Penta Forum representative at Eurelectric Conference November 19 2015. Available at: http://www.eurelectric.org/media/245758/wiersema.pdf

3.2.4. What role for European policy?

3.2.4.1. Guiding the process of regional cooperation

The European Union has already sent a strong signal that it intends for regional cooperation to be a key pillar of its approach climate and energy governance post-2020, and under its so-called "Energy Union" project. The key challenge for the EU will be execution. In particular, the EU must be careful to strike an appropriate balance between ensuring that the right issues are addressed by regional cooperation—issues of strategic importance to Europe's climate and energy goals—without being overly proscriptive on solutions. The latter consideration is important given the very different individual starting points of Member States in terms electricity market design, RES shares, maturity of national value chains, etc.

One way that the EU can try to do this is by a clear and strong guidance on *process* of regional cooperation, and its relation to the EU's new Energy Union governance mechanism, rather than by trying to proscribe specific results ex ante. For instance, Umpfenbach (2015) provides a detailed survey of experience from existing regional energy cooperation initiatives in the EU and highlights the importance of three design elements to delivering concrete outcomes, such as:

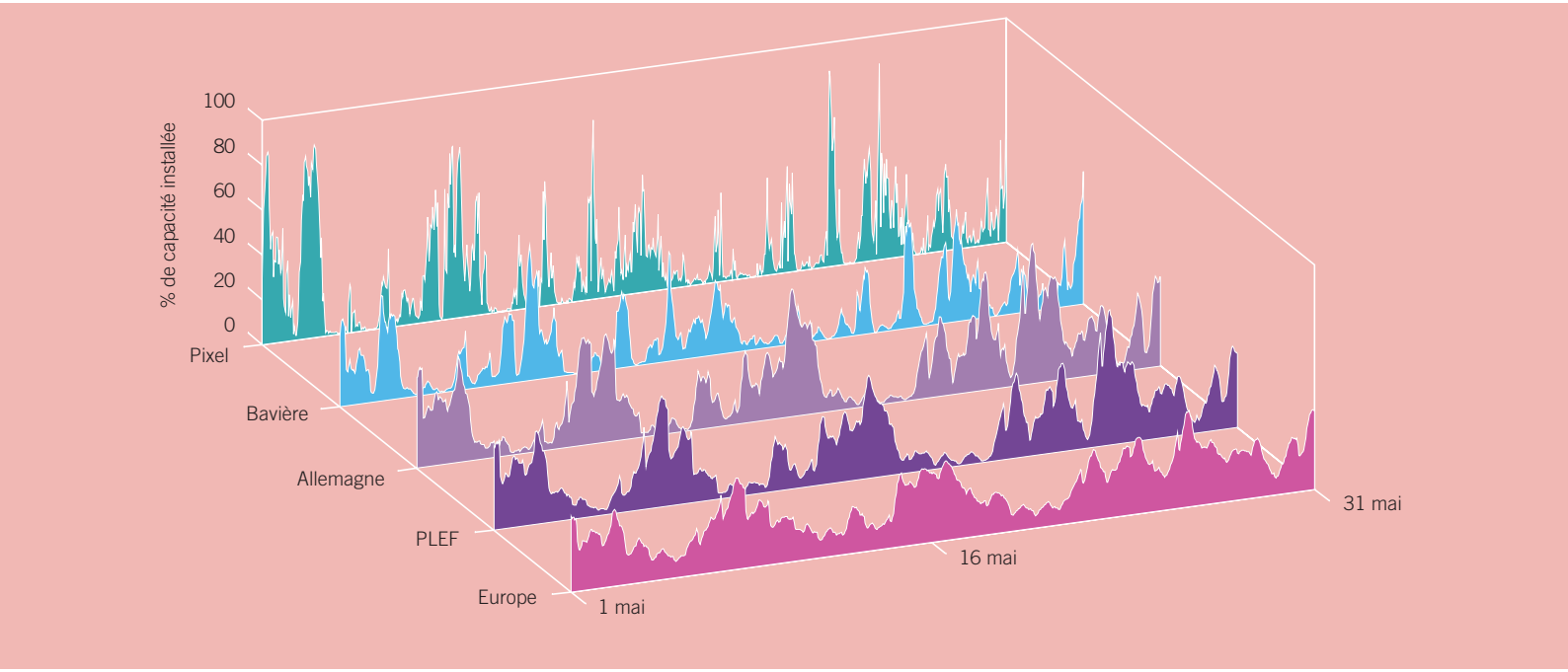
- Broad stakeholder representation
- Clear and concrete objectives
- High level political attention.

The EU should seek to pilot the process to ensure that these conditions are met by these regional fora.

To ensure clear and concrete objectives, Member States will need to have sufficiently detailed national 2030 RES-E targets and technology trajectories and integration scenarios so that they can identify priority issues to be discussed with their regional neighbours (and vice versa). This underscores the need for the RES-integration planning process outlined above. A simple "high level" national climate and energy plan that is not backed by a concrete RES deployment and integration strategy would not be sufficient to enable meaningful cooperation.

Moreover, the consultative process on the content of national climate and energy plans must ensure that Member States can place key issues, even if controversial, on the agenda of the regional fora and have them discussed. One way to ensure that this is done would be to design the template of the new national climate and energy plans to contain a space for Member States to highlight key regional cooperation issues for them in relation to RES-E

Figure 9. Injection of wind power at different geographical perimeters



Source : Fraunhofer IWES, 2015.

Note : à l'échelle locale (« Pixel », surface de 8 km²), la production éolienne varie entre 0 et 80 % de la puissance installée. Grâce à l'effet de foisonnement, cette variabilité est fortement atténuée à l'échelle européenne (en rose) : la variabilité de la production éolienne est comprise entre 10 et 40 %.

integration, with this information then being compiled by the chair of the relevant regional electricity forum to set an agenda for cooperation.

The revisions to electricity market legislation undertaken as part of the market design reform process and the new energy governance legislation to implement the Energy Union could also contain a legal requirement for Member States to discuss decisions relating to their electricity and gas markets that have significant cross border impacts with neighbouring Member States. This could build on and promote the implementation of the existing agreements between 12 European Countries on June 8 2015 to: "improve cooperation among neighbouring countries as regards the main decisions on national energy policies with potential transnational effects".[12]

12. Joint Declaration for Regional Cooperation on Security of Electricity Supply in the Framework of the Internal Energy Market, signed in Luxembourg on 8th June 2015, by Austria, Belgium, Czech Republic, Denmark, France, Germany, Luxembourg, Netherlands, Norway, Poland, Sweden and Switzerland http://www.bmwi.de/BMWi/Redaktion/PDF/J-L/joint-declaration-for-regional-cooperation-on-security-of-electricity-supply-in-the-framework-of-the-internal-energy-market,property=pdf,bereich=-bmwi2012,sprache=en,rwb=true.pdf

3.2.4.2. Harmonising support schemes: a narrow approach to a broader issue?

Another potential pathway that has been suggested for driving forward regional cooperation in electricity markets is by obliging Member States to harmonise support schemes for renewable energy. In principle one could imagine different degrees of harmonisation of support schemes, ranging from very deep integration, such as a common European market for renewable energy projects with centralised calls for tender or a tradeable certificate market, to a requirement that Member States open up a percentage of their national support schemes to bids from projects to build renewables sites that would be located in other EU Member States.

A full opening up of support schemes for RES-E projects, as envisaged in, say, a common EU market is likely to prove problematic in the present French context. This is likely to add significant uncertainty to a domestic industry that still remains relatively immature and has been struggling to establish a steady and reliable pipeline of projects. This uncertainty, combined with intensified competition from abroad, could also run a risk of undermining hard-won gains in developing domestic French industry, local value chains, employment, project know-how, etc. Thus, the static economic efficiency gains of opening up support schemes

for individual projects *at the present stage* would appear to run an unacceptably high risk of being outweighed by losses of dynamic efficiency from developing these building blocks. Further, from a political economy perspective, the concept of obliging French consumers to pay for a significant share of RES projects that were not consumed in France could also prove challenging to overcome and this could have the unintended consequence of slowing support for renewable energy in France more generally.

An alternative approach might be to pursue a more limited harmonisation of national RES support schemes, for instance, by requiring Member States to open up a small percentage of their national calls for tender to participation by projects in other Member States with whom they are interconnected. A potential benefit of this approach could that be it would to some extent protect the development of a domestic industry while still exposing it to competition in order to drive static efficiency in terms of the location of projects across Europe. It would offer an indirect way of placing some external pressure on Member States with inefficient domestic enabling environments for RES projects to improve them. Finally, it could be argued that this would provide an additional incentive for regional cooperation in electricity markets.

However, even such a limited approach also comes with a number of potential drawbacks. First and foremost, the political economy of asking domestic consumers to pay even for a share of projects that are not constructed or producing energy in domestic territory is still likely to be difficult to navigate. In Member States where renewable energy is not yet well-established and publicly accepted by many stakeholders, such as in France, or indeed in Central and Eastern Europe, such an approach is likely to be interpreted as reinforcing the case against developing renewable energy domestically.

Such rules could therefore easily prove counterproductive unless some clear burden-sharing type of arrangement was established to make the sharing of costs equitable. However, creating such a burden-sharing system is likely to be challenging in the context of the 2030 climate and energy package, where Member States will not have binding national targets and thus there is no explicit "burden" to share out between them.

A further risk of opening up national calls for tender to cross border participation is that the process may actually provide much less in terms of efficiency gains than is anticipated. In particular, allowing projects in other EU Member States to participate and potentially win calls for tender the "domestic" Member State would require an additional layer of administrative complexity. A project would need to demonstrate its eligibility and be effectively approved in two separate countries. Project developers would also be subject to the regulatory risks of two separate Member States, not just one. A system for transferring information about projects, their production and remuneration between the two Member States would need to be in place and function between all the interconnected Member States in the Union. Once these complexities and the risks for project developers that they entail are allowed for, it may be the case that compulsory opening of a part of support schemes is less efficient than expected.

Furthermore, if one takes a longer term view of the need for cross border coordination on renewable deployment, then one must also question the assumption that "support schemes" per se will continue to exist in their current form. As argued above, at high shares of RES, the political and economic imperatives for a market design that drives RES deployment "within the market" also become more relevant. But if RES deployment is driven by the market itself, then support schemes as such no longer exist—or at least not in their present form. Thus one must question what is the strategic interest in a large scale push to align support schemes in all Member States?

Practically speaking, the tight relationship between various questions of power market design, regional market integration, and the economic framework for supporting renewables, suggest that these issues would be best tackled as a package in order to develop more integrated and durable solutions. This in turn would seem to suggest that regional electricity market cooperation initiatives might be the best place to drive forward the agenda of harmonizing integration of renewables into markets (including investment signals as one element, rather than as an independent issue).

In keeping with this logic, in the short-to-medium term, more value might therefore be gained by focusing attention on cooperation *on specific RES projects* between Member States and their neighbours at *sub-national level, and in areas that have direct cross-border* impacts (e.g. offshore wind or for cross-border physical flows). It is in these contexts where the challenging questions of how share project costs and benefits are most concrete for the time being. As a way of supporting the learning process and overcoming the greater risk and complexity of such projects, the EU could potentially make such projects a focus of its attempts to support the achievement of the EU's 27% RES target, e.g. by allowing such projects to apply for "off-the-shelf" EU financial and technical support, similarly to what is currently provided by the EU with infrastructure Projects of Common Interest.

3.3. Strengthening the regulatory enabling environment for realising RES projects

There are several factors in France that create a difficult enabling environment for the deployment of renewable energy. One indicator of this is that, on average, RES projects in France take 7 to 8 years from initial decision to build to project completion (SER, 2014; UFE, 2014), compared to roughly 3 years in neighbouring Germany. These delays add to the cost of developing projects and thus the long run cost of support schemes. They have slowed deployment rates in France, contributing to the fact that deployment of RES is moving off track compared to France's 2020 targets. These delays are due to a number of specific factors:

3.3.1. Administrative and regulatory barriers and project delays, costs and risks

One significant cause of project delays is the long periods it takes for the French administration to process applications for project approval. For instance, project developers note that it takes France over a year to simply notify that a deposed request for approval is complete and is in order to be evaluated by the administration. Project developers note that while the administration has pledged to reduce delays to begin treating permitting applications to a maximum of 10 months, in reality delays are presently significantly longer. This result suggests a lack of capacity allocated to the task, rather than a problem with the administration procedures per se.

Long delays for grid connection and reinforcement are also common. Project managers report that excuses for grid connection delays can include such things as the TSOs and DSOs being "swamped" with a backlog of requests for connection or "not having enough stock" of equipment to complete works. Such explanations for delays suggest that the underlying problem probably relates to a lack of economic or regulatory incentives for these actors to prioritise these works, allocate sufficient resources and to ensure that works are undertaken at least cost. More recently, the government has passed legislation requiring the treatment of applications for connection within 18 months of the request being lodged. However, it is not yet clear how this 18-month delay will be enforced in practice.

Project developers also complain about frequent changes to the regulatory environment that can often have unexpected and other negative consequences for the time taken to get projects fully approved and built. For instance, a recently proposed decree relating to the new framework for the new system of calls for tender for solar PV projects effectively proposes to have project construction permits validated twice—once at national level and once at local level (where they are traditionally treated). It also potentially creates conflicting rules regarding the possibility of construction in zones classified for natural protection between local and national authorities.[13]

Another example of unintended consequences of changes to the permitting process is the recent experimentation with a "single authorisation" process. This was intended to speed up processing but has actually added additional complications because the separate parts of the permitting application are still treated by different authorities. However, the single window has removed the interface between the project developers and the authorising bodies. Hence, problems or questions with authorisation cannot be resolved as easily as in the past, thus adding additional delays and complications.

Another major source of project delays and additional project costs in France is local opposition to RES and particularly wind projects. A very high percentage of wind projects in France are subject to legal challenges (Rudinger, 2016). Many of these legal challenges are driven by professional associations in France that have an ideological opposition to wind technology itself. Indeed, project developers typically report that roughly 90% of legal challenges to projects are ultimately rejected, however the impact is often one of up to 3 years delay to the realisation of projects.

To some extent, public opposition is a tricky challenge to address, as the legitimate right to contest the public interest of a specific project must be protected. However there are a number of steps that could still be taken. The first would be for the government to place a higher priority on releasing significant amounts of public lands for project realisation. One of the major factors contributing to the barrier posed by public opposition to wind projects is the difficulty for project developers to obtain land-space in areas that are less likely to generate public opposition. For instance, many wind farm developers have difficulty being given the right to build on land reserved for military training in particular, for civil aviation, or for the use of meteorological radars. While the decision to build in these areas involves trade-offs and careful management, experience in other countries like Germany suggests that cohabitation is not impossible. However, in France developers report an

13. https://www.contexte.com/article/energie-renouvelable/info-contexte-photovoltaique-au-sol-le-contenu-du-projet-dappel-doffres_47892.html

insufficient prioritization of RES development to enable the political discussion necessary to open up what are very large tracts of land to shared usage.

In addition, stronger penalties for abusive legal challenges and specialized tribunals to tackle specific and frequent types of challenges may help reduce delays related to spurious or ideologically driven legal challenges. Finally, a stronger role for citizen and local-government or community driven projects could also play a role.

3.3.2. The potential to further reduce the cost of project finance

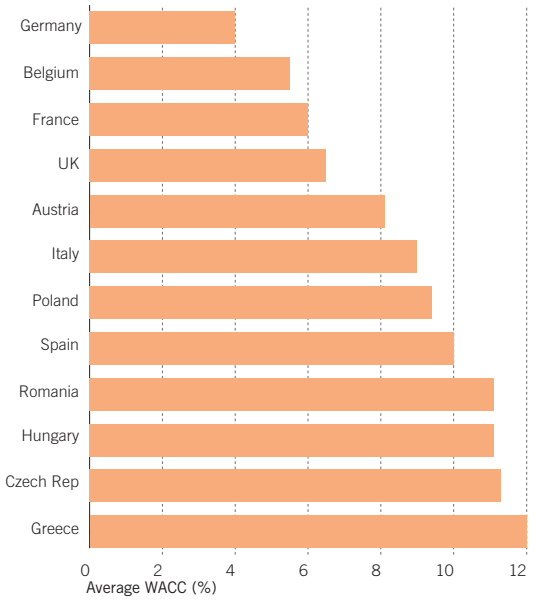
Given the high capital expenditure to operating expenditure ratio, a key factor affecting the cost of renewable energy projects and related support schemes is the weighted average cost of capital for RES projects. For instance, a difference of in the cost of capital of 2 percentage points on a 20-year loan for a RES project implies an increase in the total cash outlay to pay for the cost of the project of +30.9%.

Project financing costs have come down in France in recent years with the fall in long term interest rates in France. However, French financing costs remain significantly higher than those of neighbouring Belgium and Germany (see Figure 10). The difference cannot be fully explained by small differences in long term government bond rates.[14] Rather, a key reason seems to stem mainly from a high level of KfW bank loans with interest rates ranging from 1.65 to 4.15% p.a. for wind generators. More than 80% of wind farms in Germany have loans from the KfW Bank Group (DIW Berlin, 2015). A high level of participatory project financing (by local communities) and higher project risks probably also play a role.

These results suggest that the costs could potentially be brought down further by promoting a stronger and more systematic role for catalytic public financing of RES projects in France, as is used in neighbouring Germany.

An argument made against stronger public involvement in project finance in France is that it would effectively transfer risk and associated costs from the private sector to the public sector. However, in practice, this need not be a zero sum game. Firstly, public finance need not crowd out private finance—for instance, if the public sector lends to banks who in turn lend to projects and as is currently done in France to finance banks which make zero-interest loans for thermal retrofits of buildings.

Figure 10. WACC comparison for onshore wind across selected EU Member States



Data source: Diacore 2016, IDDRI.

Secondly there is an argument to be made that stronger public sector involvement in project finance would lead to lower financing costs than if finance were uniquely provided by the private sector. This is partly because the public sector would have some "skin in the game" and thus could have the effect of better aligning public sector incentives around the optimisation of the regulatory frameworks and limiting unnecessary of risks and costs for project development. However, another reason is that the public sector could have a different appreciation of the risks of investing in projects—after all, the public sector would have no asymmetry of information about its own policy intentions and thus regulatory risks, as the private sector does.

Thirdly, from a political economy perspective there may also be advantages to financing the surplus costs of renewable energy technologies by reducing the cost of capital from the public balance sheet, rather than via allocating the entire cost to a subset of electricity consumers. For example, by treating the energy transition as a "public good" and therefore spreading the incremental cost of it across all tax-payers rather than simply treating it as an additional cost of electricity provision that contributes to rising electricity prices.

Finally, financial sector experts note that riskier and less mature project types, such as

14. The difference in French and German 10-year bond rates has remained close to but below 40 basis points since 2014 (http://countryeconomy.com/risk-premium/france). This cannot fully explain differences of around 2% in the weighted average cost of capital that are currently observed for similar project types.

methanisation and offshore wind, could benefit in particular further from reductions in the cost of finance, where private financers tend to place a high risk premium on lending to such projects in large part because pricing risk is more difficult and some projects have difficulty attracting finance. Since the public sector will ultimately pay for these project risks anyway (i.e. through higher support costs), and since the public sector may have a different appreciation of the risks of supporting the technology, there is a stronger case for the public sector should play a larger role in financing these projects directly.

3.3.3. What role for European policy?

As a rule Europe cannot proscribe very specific solutions for France on its own domestic regulatory environment. Nevertheless, Europe has a legitimate role to promote efficient, cost-effective and non-discriminatory governance of deployment of renewable energy in the Member States.

To this end, Europe can do three things. Firstly, it must maintain and in places strengthen the requirements for good practice with regards to administrative burden, easy access for grid connection that are already outlined in Articles 13, 14 and 16 in the 2009 Directive. Specific issues that are not adequately covered by these articles from a French perspective are the issues of project delays due to an inadequate capacity, an excessively burdensome and unstable regulatory environment, and effective incentives for network connection delays and cost minimisation. In addition, these articles could ensure transparency on the criteria and scoring used to decide calls for tender. Further, they could introduce requirements on Member States to take measures to ensure easy access to finance and minimise financing costs to lower the global cost of support schemes.

Articles addressing these issues explicitly must not only be included in the directive but also involve specific reporting requirements that track progress. For instance, Member States could be required to report on average times taken from call for tender to project commissioning, on average financing costs by technology category, on the share of projects making use of catalytic public financing, on the frequency and time taken to clarify legal challenges, and on the availability of public lands to RES projects (see Table 1 below).

On finance, France could also potentially benefit from the use of public guarantees for more immature and less well-understood project types. This is particularly relevant in France for biogas and projects, where financing costs are significantly higher than for more mature technologies. An EU facility to provide such guarantees to senior debt holds could potentially help to reduce project costs significantly and allow for a faster development of the sector.

Finally, the Commission should use its capacity to coordinate technical implementation within the Member States to share examples of good practice in the areas of network connection and reinforcement practices, permitting, overcoming local opposition, finance, etc. (bearing in mind the differences between Member States of course). This could involve workshops, promotion of bilateral regulatory cooperation, or the publication of technical guidelines or reports that benchmark Member States against each other and highlight specific examples of good practice.

3.4. Ensuring the achievement of European RES deployment objectives

3.4.1. Context and relevance for France

France's renewable energy targets will not be achieved in a domestic vacuum. On the contrary, maintaining momentum to achieve France's ambitious 2030 targets is likely to depend on the extent to which *other* European countries set ambitious targets and achieve them.

This is partly a question of political economy, e.g. can the cost and effort of achieving domestic targets be justified if Europe is not, for instance, on track to achieve its politically agreed 2030 target of 27% RES in total final energy consumption? It is also a question of the need for other Member States to be making progress in the actual deployment of renewable energy in order to provide momentum to cross-border cooperation and internal market reforms that France itself will inevitably need to make use of to integrate large shares of renewable energy.

However, unlike the 2020 Climate and Energy Package, the post-2020 Renewable Energy Directive will not include legally binding targets for Member States. Instead it has set a more political goal of an "EU binding" 27% RES target by 2030. To structure the achievement and tracking of progress towards this goal, it has also asked Member States to develop National Climate and Energy Plans that will set nationally determined RES goals and highlight intended trajectories toward them.

The fact that Member States will not have legally binding targets but that the EU will have a politically agreed target at EU level has in turn led to a debate about "what happens if the Member States individual targets do not add up to 27% at EU level?" Various course correction and "gap-filler" mechanisms are therefore discussed. But is the strong focus on this issue justified?

3.4.2. What role for European policy?

The EU should be bound to meet its politically agreement commitments and the Member States should be bound to honour their responsibilities to contribute to it. However, there are also strong arguments that the heavy focus of the "gap filler" mechanism to fix any possible gap in ambition or implementation and the EU's 27% target is distracting from the broader issues.

The broader goal of EU RES policy is not to achieve a 27% target at all costs, but to set in train a broader scaling up of renewable energy across all Member States and energy sectors in view to achieve its more ambitious decarbonisation and energy security goals. The limited importance of the 27% target is also reinforced in the wake of the Paris Agreement on climate change, calls upon all countries to successively scale up their climate ambition and implementation efforts (including renewables) on a five-yearly cyclical basis. In this context, the focus should arguably be more heavily placed on how to remove barriers to RES ambition and implementation in the Member States in order to create a more ambitious growth trajectory of RES in all Member States and in key energy sectors.

Studies on the state of RES deployment across all 28 Member States suggest that major barriers to further RES deployment for many Member States include:[15]

- a lack of political prioritisation of RES in the allocation of scarce public funds;
- high financing costs for projects;[16]
- inadequate or weakened economic support schemes;
- high regulatory risks and administrative barriers;
- a lack of domestic value chains for deployment (and the sense that the industrial policy/economic benefits for renewables are not necessarily captured domestically).

A first step to tackling these bottlenecks to progress would be to require Member States to identify each of the above items explicitly in their National Climate and Energy Plans and to explain how they intend to respond to each issue. This way the relevant bottlenecks can be made transparent and become the subject of specific monitoring and focus necessary attention for policy development. Indeed, this should be the purpose of the Climate and Energy planning and reporting process under the new post-2020 Energy Union governance mechanism. However, getting the right attention drawn to these issues will require that sufficient space is dedicated to them in the planning and reporting templates.

Another way of increasing the prioritisation of renewable energy is for Europe, as part of a broader strategic review of European climate governance, to improve the effectiveness of the use of EU Structural and Investment Funds for climate and energy activities.[17] Closer alignment of the governance of the EU's climate and energy goals with the governance of EU Funds in the post-2020 MFF thus seems necessary to unlock some of the barriers to the higher prioritisation of renewable energy projects in the Member States.

However, apart from simple prioritisation, the remaining barriers to RES deployment also need to be addressed. The revised Renewable Energy Directive for the post-2020 period must therefore focus on these issues. It should provide clear legal obligations for Member States to:

- provide stable and bankable economic incentives for RES-deployment;
- keep administrative burdens and associated project delays to reasonable levels (compared to EU benchmarks);
- provide a reasonable level of regulatory stability;
- ensure transparency and cost efficiency relating to network costs for deployment;
- take measures to create and sustain domestic value chains for RES (in line with EU competition law).

Moreover, these obligations should be closely linked to reliable indicators that can serve as early warning signs that these criteria are not being met (see Table 1). These could include such things as average weighted average cost of capital of key technology types (financing costs), the percentage of projects making use of public funds (financing costs), the average delay from call for tender to production for RES projects (administrative burdens),

15. Cf. for instance, CE Delft (2014), Diacore (2016), ICCG (2015), Bankwatch (2015).

16. Diacore (2016) reports that the weighted average cost of capital for onshore wind projects in Europe varies from less than 6% in Germany to more than 11% in a number of Central and Eastern European and peripheral Member States, and required returns on equity range from around 7 to 22%.

17. For instance, Bankwatch (2015) studies the use of Cohesion and EFRD funds in Central and Eastern European Member States and points out that a large share of the non-climate portion of the funds still go to expanding traditional fossil fuel-burning economic activities alongside (suggesting a failure of "mainstreaming" of climate into spending). Moreover, where directed to climate change or renewable energy projects, Funds often have their effectiveness "watered down" between the headline strategies contained in the Operating Programs and the decision on the actual allocation of funds at the project or regional level.

on the frequency and length of legal challenges to RES projects (public acceptability and administrative efficiency), on the total annual the RES-deployment growth rate per sector (regulatory stability), and average network connection delays and costs (networks), and on the availability of public lands to RES projects (public prioritisation). Reporting on these indicators through the EU's new planning and reporting mechanism for Energy Union governance could be a way to ensure that otherwise difficult to monitor measures in the Directive are indeed complied with.

Table 1. Key enabling conditions for RES projects and possible indicators to track national performance

Key enabling condition	Indicators to track and assess implementation
Financing costs	Average weighted average cost of capital of key technology types Percentage of projects making use of public funds
Admin burden	Average time taken from initial call for tender to first payment for energy production
Public acceptability	Percentage of projects subject to legal challenges
Regulatory stability	Stability of deployment rates (MW and % growth p.a.)
Efficient network connections	Average time taken to treat network connection request
Availability of land-space	Amount of land-space zoned or otherwise available for RES-E deployment
Overall support cost-effectiveness	Average annual price per KWh per technology
Overall cost of deployment (prioritisation)	Total annual public expenditure on RES deployment as a % of GDP

Source: IDDRI.

In addition to these concrete elements of the Directive and the new governance mechanism, the EU could also potentially explore a number of other options to address barriers to RES development in Europe. These might include such things as:

- Encouraging regional industrial partnerships on RES value chains;
- Strengthening the sharing of information on policy practices between Member States;
- Better aligning economic development and RES policy goals for Member States via the way the EU funds are allocated, including via better defining low-carbon project quality standards for disbursement of funds;
- Increasing dialogue between Member States and the Commission on the barriers to raising the ambition of their climate/RES.

Finally, the EU could also seek to put in place safeguards for the achievement of its symbolically important 27% target. This includes might include a new fund into which Member States pay to honour their collective commitment to the EU binding target. These funds could be used to develop ambitious new renewable energy policies in lower-income Member States, or to promote strategic regional cooperation projects, such as offshore grid projects. However, this fund should be seen as part of a broader strategy to strengthen the momentum of RES development in the EU, rather than as a specific gap-filler tool to achieve a 27% target.

4. CONCLUSION

Given the ambition of its objectives, the period from 2020 to 2030 will be a critical for the development of renewable energy in France. Renewable electricity sources are expected to play a critical role in achieving France's RES targets. Improving conditions in the French domestic regulatory context will be critical for achieving these targets. However, Europe can still do a lot to help clear away potential barriers for France to achieve its objectives, particularly in the electricity sector. The interface between European and French policy in the power sector will therefore need to find an appropriate balance.

On the one hand, given the already strong economic and political spill-overs between the policies of different Member States, France cannot hope to achieve its energy transition goals by operating in isolation of the broader European context. A robust role for European policy framework for the EU's and France's RES objectives and RES-E objectives as part of that can significantly help France to achieve its own domestic goals, by creating the necessary enabling conditions.

At the same time, France also needs the European policy framework to be sensitive to specific areas where continued national flexibility and a "bottom up" approach to solving RES deployment and integration problems is needed. This is particularly relevant in terms of the speed of phase out of support schemes and support scheme design for RES-E, the opening up of support schemes to cross-border participation, market design and RES-integration strategies. A close examination of the French context on these issues strongly suggests that a one-size fits all approach is likely to be counterproductive.

As the 2nd largest energy consumer in Europe after Germany, the European low-carbon transition would benefit enormously from the development a strong renewable energy sector in France. Getting the policy mix in for the deployment and integration of renewable electricity is a crucial component of this.

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Oliver Sartor (IDDRI)

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