



Technical support for RES policy development and implementation – Simplification of permission and administrative procedures for RES installations (RES Simplify)



France

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Executive summary

This report identifies and analyses the existing administrative and grid connection procedures for those three technologies with the highest deployment targets for France for the next decade: wind onshore, ground-mounted PV and rooftop PV.

In order to achieve its renewable energy deployment targets as set out in the NECP, France should ensure the removal of the main administrative and permitting barriers currently hindering the deployment of wind onshore and PV.

Aviation and military restrictions are one the main issues when it comes to the development of onshore wind parks. Approximately 45% of new wind onshore projects are struggling to find suitable locations due to restrictions imposed by meteorological, military or civic aviation regulations.

The regulatory changes in the past few years, particularly affecting administrative procedures for onshore wind projects, have further aggravated the lack of expertise among employees of the competent authorities. Although an integrated environmental permitting procedure has been implemented for wind onshore projects, the processing of applications remains a complex and tedious task. In addition, interviewees pointed out the frequent delays in obtaining the final approval for the integrated environmental permit, due to numerous requests for complementary information.

These difficulties have repercussions on grid connection where the waiting time for obtaining a permit is lengthened, leading to a drain on installed capacity. In addition, solar and onshore wind projects are currently facing a difficult and time-consuming connection to the grid, as the grid is ageing and no longer able to keep pace with new installations' connections.

Table 1 contains a traffic light assessment of the relevant process steps for the installation of ground-mounted and rooftop PVs as well as onshore wind in France.

Table 1: Traffic light assessment of the relevant process steps

Process step	Site selection	Electricity production license	Application preparation process	Administrative authorisation	Grid connection permit	Corporate legal-fiscal	Other
Onshore wind	Yellow	Green	White	Yellow	Red	White	White
PV rooftop	Yellow	Green	White	Yellow	Red	White	White
PV ground-mounted	Yellow	Green	White	Yellow	Red	White	White

■ No barriers identified	■ Moderate barriers identified
■ Minor barriers identified	■ Not relevant for target country
■ Severe barriers identified	■ No projects implemented

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1. National RES targets and relevant RES technologies

The Energy Transition for Green Growth Act (LTECV) sets targets for renewable energy, stating that the share of renewable energy in final energy consumption should reach 23% by 2020, and 33% by 2030 (NECP, 2020). In order to achieve this 2030 target, it is expected that renewable energy sources should account for no less than 40% of electricity production and no less than 38% of final heat consumption. The French NECP is based on two documents – (1) the Multiannual Energy Plan (*programmation pluriannuelle de l'énergie* - PPE) and (2) the National Low-Carbon Strategy (*stratégie nationale bas-carbone* - SNBC). The PPE sets the priorities for government action in the energy sector for the upcoming 10 years and the goals for the accelerated development of renewable energies by 2028, which would form the basis for reaching the 2030 targets stipulated in the NECP. If the PPE goals are achieved, it would result in a doubling of installed renewable electricity capacity by 2028 compared to 2017 levels, which would mean that renewables would account for 36% in the national electricity mix in 2028 (equals 101¹ - 113² GW). In the heating sector, the renewable heat production would increase by 40-60% by 2028 compared to 2016, if the PPE targets are achieved. This would result in renewables accounting for 34 - 39% of total heat consumption (equals 219³ - 247⁴ TWh) (NECP, 2020).

According to the PPE for the period 2019-2028, it is expected that the installed capacity of renewable energy sources in the electricity sector would increase as follows (NECP, 2020)⁵:

- Hydropower: from 25.3 GW in 2016 to 26.4 - 26.7 GW in 2028 (mainly by optimising the existing power plants);
- Onshore wind: from 11.7 GW in 2016 to 33.2 - 34.7 GW in 2028 (corresponds to 14,200-15,500 wind turbines in 2028, compared to about 8,000 at the end of 2018);
- Ground-mounted PV: from 3.8 GW in 2016 to 20.6 - 25 GW in 2028;
- Rooftop PV: from 3.2 GW in 2016 to 14.5 - 19 GW in 2028;
- Biomass cogeneration: from 0.59 GW in 2016 to 0.8 GW in 2028;
- Biogas cogeneration: from 0.11 GW in 2016 to 0.34 - 0.41 GW in 2028.

As far as the heating production is concerned, the PPE for the period 2019-2028 foresees the following growth targets by 2028 (NECP, 2020)⁶:

- Solid biomass: from 145 TWh in 2023 to 157 - 169 TWh in 2028;
- Aerothermal heat pumps: from 27.6 TWh in 2017 to 39 - 45 TWh in 2028;
- Geothermal heat pumps: from 3.14 TWh in 2017 to 5 - 7 TWh in 2028;
- Deep geothermal: from 1.18 TWh in 2017 to 4 - 5.2 TWh in 2028;
- Solar thermal: from 1.18 TWh in 2017 to 1.85 - 2.5 TWh in 2018.

As listed above, the most important growth targets are planned for onshore wind, ground-mounted PV and rooftop PV, which is why this report will focus on these three RES-E technologies.

¹ Low target in PPE for 2028 (Scenario A)

² High target in PPE for 2028 (Scenario B)

³ Low target in PPE for 2028 (Scenario A)

⁴ High target in PPE for 2028 (Scenario B)

⁵ The technology-specific targets by 2028 respectively correspond to the low and high target (scenario A and B)

⁶ *ibid.*

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Figure 1 below displays the annual deployment of solar PV and onshore wind between 2010 and 2019. It can be observed that there was a strong deployment of onshore wind since 2013. However, the sector is undergoing a downward trend since 2017. As far as PV is concerned, after a high peak in capacity deployment in 2011, the annual installed capacity has overall been quite stable since 2014, except for the year 2016 which experienced a noticeable setback.

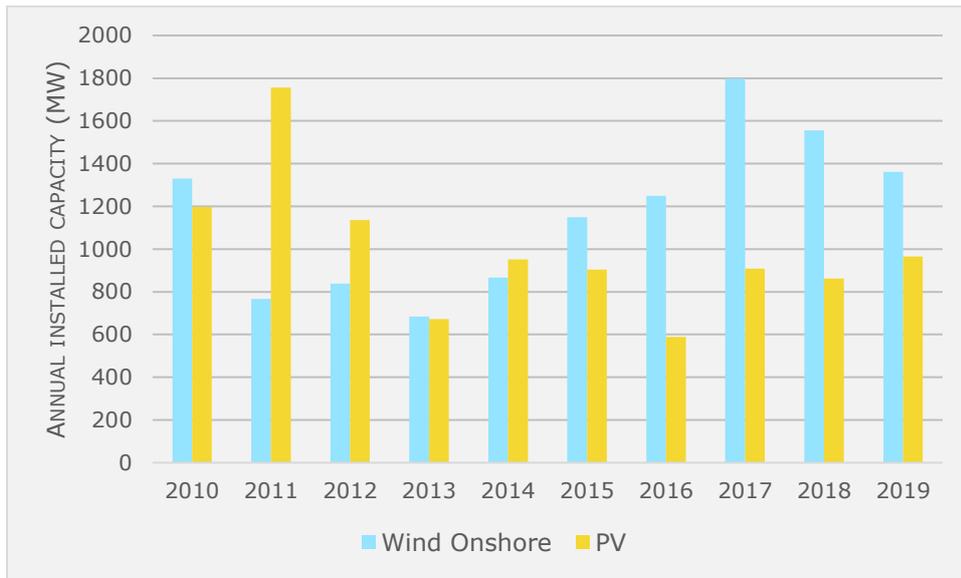


Figure 1: Annual installed capacity of PV and Wind onshore 2010-2019 (source: EurObserv'ER)

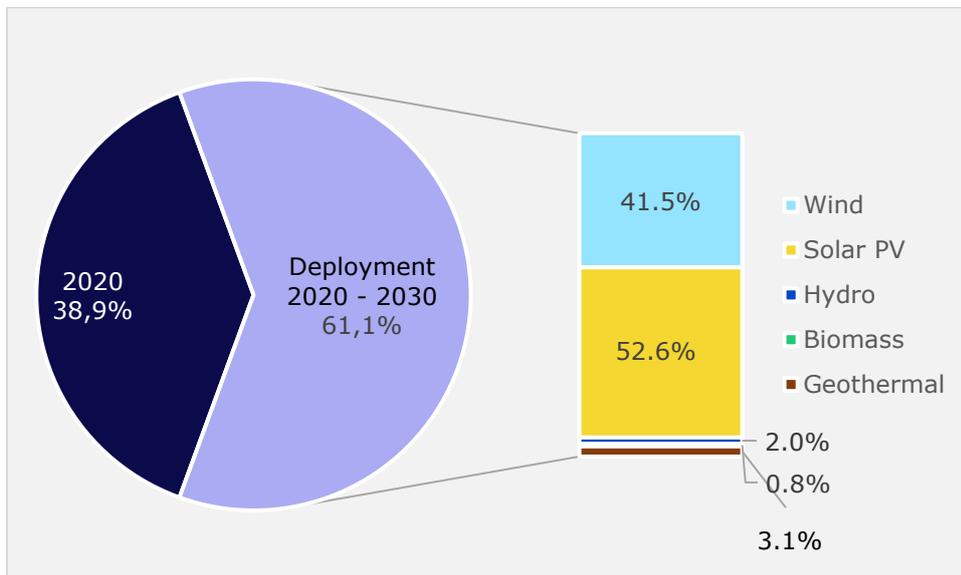


Figure 2: Planned deployment of RES-E 2020-2030 in relation to past deployment (source: NECP)

2. Administrative and grid connection procedure

2.1. Relevant process steps

The first step in realising a renewable energy project in France is identifying a suitable location for the project. For onshore projects and ground-mounted PV installations over 250 kWp, this stage also includes a preliminary assessment by the project developer to determine whether the selected site is appropriate given the scope of the project and its impacts on the environment, the biodiversity, the landscape, the historical heritage and the local population.

When planning an **onshore wind project**, project developers need to take certain technology specific distance requirements into account. First, onshore wind farms may not be built within the protection area surrounding meteorological, military and civil aviation radars. The coverage of the protection areas ranges from 5 km to 30 km around the radar. The exact distance depends on the radar use, the radar technology and the position of the wind turbines. Second, wind power plants must be located at a minimum distance of 300 m from any nuclear power plant as well as from any 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE). In addition, no wind turbines higher than 50 m can be erected closer than 500 m to any area intended for residential use and rail structure.

The national legislation stipulates that the site selection for a **ground-mounted PV** project depends on the local regulatory framework. Priority shall be given to urbanised and future urbanised areas set out in the Local Urban Plans (*Plan Local d'Urbanisme* - PLU) (Circulaire du 18 décembre 2009). The installation of a ground-mounted PV plant in agricultural and natural areas is only possible with a derogation, as defined by the town planning code.

Rooftop PV systems can be constructed on both the existing and new buildings. However, there are some regulations to be taken into account when deciding on the location for these systems. Thus, if the project is located within a 500 m radius of a listed monument, visibility issues will be part of the approval process, i.e., the French Architectural Review Board (*Architecte des Bâtiments de France* - ABF) will need to assess if the protected monument and the PV system are compatible.

When selecting a location, the project developer will get in touch with the grid operator to inquire about the grid connection possibilities at the intended plot of land. However, it is not possible to reserve grid capacity for the future project at this stage.

The electricity production licence is required only for PV installations (both **ground-mounted and rooftop**) and **wind onshore** projects with an installed capacity of more than 50 MW. It is issued by the Directorate General of Energy and Climate (*Direction Générale de l'énergie et du climat* - DGEC). The electricity production licence is submitted as part of the integrated environmental permit (*Autorisation environnementale unique*) for a large number of onshore wind plants (see below).

Most of the work related to authorisations and spatial planning is carried out during the "administrative procedure" phase, where spatial planning, environmental impact assessment (EIA) and building authorisation take place. The administrative procedures differ for wind onshore, ground-mounted or rooftop PV installations. Furthermore, given the chain of actors involved in obtaining authorisations, this stage can involve numerous

procedures and therefore raise obstacles and include significant delay, despite the predefined deadlines.

An integrated environmental authorisation has been implemented for **wind onshore** turbines with a mast height over 50 m or those with a mast height of between 12 and 50 m and a capacity of at least 20 MW. This procedure allows for a single examination of several permits, which include among others the authorisation to operate 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE), authorisations regarding air navigation and military rights of way (*autorisations requises au titre des obstacles à la navigation aérienne et des servitudes militaires*) and the electricity production licence (*autorisation d'exploiter une installation de production d'électricité*).

Ground-mounted PV installations over 250 kWp are subject to several town planning and environmental regulations, involving at least a building permit, an environmental impact assessment and a public enquiry. **Rooftop PV** installations on existing buildings generally only require a prior declaration to be submitted to the local competent authority (e.g. town hall or Prefect). Buildings with a floor area of more than 1000 m² are subject to specific provisions, including among others the integration of a renewable energy production system. For rooftop PV projects on new buildings, it is necessary to integrate the project to the standard building permit application.

Once all necessary approvals have been obtained, the project will move to the grid connection stage, which in France is subject to a range of obstacles. Depending on the installed capacity, the grid connection request will be addressed either to the national TSO (i.e., *Gestionnaire de Réseau de Transport d'Electricité* – RTE) or to the main national (i.e., *Enedis*) and local DSO (i.e., *Entreprises locales de distribution* - ELD). It has to be noted that the grid connection approval process is a major obstacle for **onshore wind, ground-mounted PV and rooftop PV** projects. This is mainly because of the ageing national grid, which continues to slow down the approval by the grid operator. The grid operators are currently no longer able to effectively meet the grid connection requests, which leads to bottlenecks and delays in the commissioning of the renewable energy systems. Such delays have severe impacts on the feasibility of the projects, which leads to the fact that the realisation of some onshore wind and ground-mounted PV projects is even abandoned.

2.1.1. Site selection

Process flow

In France, renewable energies are deployed based on two key national strategic documents: The Energy Transition for Green Growth Act (*Loi relative à la transition énergétique pour la croissance verte* - LTECV) and the Multiannual Energy Plan (*programmation pluriannuelle de l'énergie* - MEP). These national documents are then implemented by the competent authorities at the regional and local levels, which turn the national objectives into regional and local actions (ICLG, 2021).

There are three levels of spatial planning in France: regional, inter-municipal and local levels. At the regional level, there are Regional plans for spatial planning, sustainable development and equality (*Schéma d'aménagement, de développement durable et d'égalité des territoires* - SRADDET). These plans contain renewable energy development targets for each region (OECD, 2017). Another regional document with the relevance for renewable energy projects is the Regional grid connection plan for renewable energies

(*Schéma régional de raccordement au réseau des ENR - ENR'S3EnR*). The regional grid connection plans are developed by the French transmission system operator (TSO) – RTE. Their aim is to reserve certain network capacities for renewable energy projects and to bundle the grid connection costs between various electricity producers within a region in question (RTE France, 2021).

At the inter-municipal level, the Territorial Coherence Scheme (*Schéma de Cohérence Territoriale - SCoT*), drafted by inter-municipal associations, is a plan that is placed between regional plans and local land-use plans (*Plan local de l'urbanisme - PLU or PLUI*). The aim of SCoTs is to guide local land-use plans (SCoTs are legally binding for PLUs or PLUIs). It has to be noted that the municipalities are not obliged to adopt a SCoT. Municipalities without a SCoT, however, are not allowed to authorise developments in undeveloped areas. Therefore, municipalities in large urban areas in particular have strong interest in adopting a SCoT, and most of these municipalities have already done so (OECD, 2017).

At the local level, the local land-use plan (*Plan local de l'urbanisme - PLU or PLUI*) is the urban planning document on which project developers must rely upon when looking for a potential plot of land for their planned project. Therefore, these urban plans allow municipalities/inter-municipalities to display their ambitions for the deployment of renewable energy projects on their territory. As mentioned above, these urban plans must be in line with the SCoTs (art. L.151-1 to L.154-4 and Art. R.151-1 to R.153-22 Code de l'Urbanisme). It has to be noted that the great majority of municipalities in France are covered by a local land-use plan. Some municipalities are not covered by these plans, but these are mainly smaller ones, located in rural areas. These municipalities therefore refer to national planning regulations when making their land use decisions (OECD, 2017).

In the site selection stage, the first contact with the municipality and the local population is strongly recommended by various wind and solar associations (Stakeholder 2, 2021). This is an essential step for the successful implementation of any project, be it onshore wind, ground-mounted PV or rooftop PV. The pre-consultation (as early as possible) with the municipality as well as the local population helps to reduce or avoid local opposition that could become a huge obstacle to the project in a later project implementation stage. In addition, in the site selection stage the project developer will usually contact the local transmission system operator (TSO) to discuss the free grid capacity at the nearest grid connection point. Nevertheless, the grid capacity cannot be reserved at this stage, i.e., before the project developer can meet the grid connection requirements.

Onshore wind

The first step for the project owner is the identification of areas suitable for the establishment of a wind farm. These suitable zones are defined by the Regional Departments for the Environment, Development and Housing (*Directions Régionales de l'Aménagement et du Logement - DREAL*), which compile a regional inventory of wind resources. These maps integrate technical data, including the grid connection capacity, as well as the various regulatory, environmental, landscape and heritage constraints. It is within the limits of these suitable zones that the wind project developers may identify the plot of land that may potentially accommodate future wind farms (Le journal de l'éolien, 2021).

There are several types of restrictions relative to public utility that may affect the development of an onshore wind project. The main existing restrictions deal with civil and

military air navigation as well as transport and distribution infrastructure (energy, water, communication).

The prevailing regulation stipulates that disturbances generated by wind energy plants shall not significantly affect the operational capabilities of radars and navigation devices used in the context of military, civil and meteorologic security missions (Arrêté du 26 août 2011).

Regarding military aviation restrictions, a ministerial note defines three concentric zones around military radars to avoid interference from wind turbines (Ministers of Ecology and Defence, 2008):

- Protection zones: perimeter within which the risk of disturbance is too high to allow the installation of wind turbines. They cover a radius of 5 to 20 km around the radar (depending on the radar technology and the position of the wind turbines).
- Coordination zones: the installation of wind turbines is subject to an evaluation study assessing the risk of disturbance. Depending its technology, the area extends between 5 km and 30 km around the radar. The evaluation study is established in consultation with the wind farm developers, the concerned radar operators and the State services responsible for examining wind farm applications.
- Authorisation zones: areas where the installation of wind turbines does not pose a risk of radar interference.

Regarding civil aviation restrictions, a security radius of 15 km to 30 km around the radars is defined to ensure their non-disruption by wind energy plants. The length of the radius is determined by the type of radar (Arrêté du 22 juin 2020).

For meteorological radars, a security radius of 10 km to 30 km around the radars is defined to ensure their non-disruption by wind energy plants. The length of the radius is determined by the frequency band of the radar (Arrêté du 26 août 2011).

The compliance with these radar distance requirements is verified by the respective authorities during the examination phase of the application for the integrated environmental authorisation, led by the Prefect (Art. R181-32, Code de l'Environnement).

Furthermore, wind power plants must be located at a minimum distance of 300 m from any nuclear power plant as well as from any installations classified as ICPE, i.e. likely to endanger the health and safety of people living nearby (*installation classée pour la protection de l'environnement – ICPE*). A minimum distance of 500 m must be respected between the wind energy plant and any residential building, inhabited building or area intended for habitation. This distance is measured from the base of the mast of each wind turbine (Arrêté du 26 août 2011). In addition, no wind turbines higher than 50 m can be erected closer than 500 m to any area intended for residential use and rail structure (art. L553-1 Code de l'Environnement).

Finally, developers of onshore projects have to consider the impact of the project in question on the environment and the biodiversity. Generally, the developer is in charge of assessing the environmental impact by estimating the mortality of the fauna, especially birds and bats due to the presence of wind turbines (FNE, 2020). These data are collected and transferred to the national database 'legal data archive on biodiversity' (Arrêté du 17 mai 2018).

Ground-mounted PV

The national regulatory framework for urban planning generally provides for the preservation of natural areas and landscapes as well as for the protection of areas used for agricultural and forestry activities (art. L. 101-2, Code de l'Urbanisme). In this context, ground-mounted PV installations must be integrated primarily in urbanised areas or future urbanised areas, as identified in the Local Urban Plans (*Plans Locaux d'Urbanisme - PLU or PLUi*) (Circulaire du 18 décembre 2009). In the case where a territory is not covered by a town planning document, ground-mounted PV plants can be installed without any particular conditions, provided that the territory is located either in the constructible sector of a municipality with a communal map, or in the urbanised part of a municipality placed under the regime of the national planning regulations (MTES, MCT, 2020).

In principle, the installation of ground-mounted photovoltaic installations in agricultural and natural areas is inappropriate, given the necessity to preserve the agricultural character of the land concerned. However, the town planning code provides for the possibility of authorising constructions and installations necessary for public facilities (including PV), provided that they are compatible with the exercise of an agricultural activity and do not affect the preservation of natural areas and landscapes (art. L. 151-11 Code de l'Urbanisme). Furthermore, the installation of ground-mounted solar installations can be considered on plots of land which, although located in an agricultural zone, have not been used for agricultural purposes in recent times. In this case, a change of use of the land in the town planning documents is necessary (Circulaire du 18 décembre 2009).

Rooftop PV

First of all, the compatibility of the PV project with the local urban planning documents in force must be checked. The Departmental Territorial Directorate (*Direction Départementale des Territoires – DDT*) provides these urban planning documents (e.g. local urban plan or carte communale), which set out the rules for the use and external appearance of buildings. These urban planning documents define the constraints of rooftop PV installations and the necessary authorisations to be obtained. If the municipality does not have a planning document, the national planning regulations apply (photovoltaïque.info, 2021).

In addition, the project owner must also contact the town hall to obtain the information needed to respect the visual aspect of the building, be it the colour of the materials, the roof, the panels or other details imposed by the municipality in question (photovoltaïque.info, 2021).

As far as existing buildings are concerned, the agreement of all the building owners is required for the installation of a rooftop PV project. In this case, the project owner must organise a general meeting to vote on the installation of the PV project on the roof of the building (photovoltaïque.info, 2021).

If the rooftop PV project is located within the 500 m protection perimeter of a listed building, the project must be submitted to the French Architectural Review Board (*Architecte des Bâtiments de France - ABF*) for advice. In case of co-visibility between the protected monument and the photovoltaic installation, the ABF issues an opinion (acceptance or approval) to which the town hall in charge of the project application must conform. If there is no co-visibility between the listed monument and the PV installation, the competent town hall is not bound to follow the opinion (acceptance or approval) of the ABF. In most cases however, the town hall does follow the opinion of the ABF, since it

is the opinion of the ABF that is used as a reference in the event of litigation between the project owner and the competent authority (HESPUL, 2018).

Deadlines

As the preliminary negotiations or dialogue with the municipality are not official procedures, there are no deadlines related to them. However, the average time to find a suitable location for ground-mounted and rooftop PV is estimated between 3 and 6 months, depending on the municipality (FNE, 2020; ADEME, 2020). As far as onshore wind is concerned, the prospection studies conducted on the side of the project developer to identify the right location may take between 6 and 12 months' time (Le journal de l'éolien, 2021).

Detected barriers

Systematic environmental NGOs opposition to new ground-mounted and onshore projects. According to many environmental organisations, the environmental impact of onshore wind and ground-mounted PV projects is not sufficiently considered (FNE, 2021). Therefore, increased resistance is present in France from these environmental organisations who are campaigning for environmental criteria to be given greater consideration when selecting a location for a specific onshore wind or ground-mounted PV project. In addition, these organisations complain about the fact that there are sometimes even several projects in the same area, both onshore wind or ground-mounted PV, which leads to increased deterioration of the surrounding natural environment (Stakeholder 2, 2021).

Aviation and military restrictions. This remains one of the biggest barriers to onshore wind energy development in France currently. The French Civil Aviation Authority (*Direction générale de l'Aviation civile* - DGAC), the Ministry of Defence (Ministère de la Défense) and France's national meteorological service (Météo France) assess whether wind parks could negatively impact the operation of military radars, low altitude flights, meteorological and radio communication systems and forbids placing wind turbines within an up to 30 km radius of any radar installations (Arrêté du 26 août 2011, Arrêté du 22 juin 2020). Currently, this ban affects between 45% and 47% of new onshore wind projects, while RES developers are already struggling to find suitable areas for their projects (Politico, 2020). Furthermore, even if a project has been granted a final authorisation to operate 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE) by the Prefect, this decision may be revoked due to a change in military safety standards, which may lead to the project being abandoned. Hence, due to the safety standards related to civil and military aviation, project developers face difficulties in finding land to develop onshore wind projects (Stakeholder 1, 2021).

Constant updating of urban planning documents. Due to the interdependence between the strategic, policy and planning documents at national, regional and local levels, changes in the higher-level documents must also be reflected in the lower-level planning documents. Due to the frequent changes that mainly happen at the national level (e.g., *Programmation Pluriannuelle de l'Energie* - MEP), regional and local authorities sometimes have difficulty keeping up with the changes and consequently the developers are faced with the ongoing confusion, resulting from the amendments in the local planning regulations (Stakeholder 2, 2021).

Territorial constraints for ground-mounted PV and onshore wind. Due to the strict environmental requirements and aviation and military restrictions that hinder the

selection of a suitable location for the development of onshore wind or ground-mounted PV projects, a saturation trend is emerging depending on the region. It can be observed that while most of the onshore wind projects are located in the north of France, the ground-mounted PV projects are mainly concentrated in the south of the country. For these reasons, the project developers face greater difficulties to find a suitable plot of land, as these become less and less over the years (Stakeholder 1, 2021).

Repowering of onshore wind turbines. In France, the life time of many existing onshore wind farms is coming to an end. Since there are territorial constraints for the new projects due to the strict environmental requirements as well as aviation and military restrictions, repowering of the existing power plants would be one good solution. However, repowering is also subject to territorial restrictions, as 65% of onshore wind farms built before 2015 are subject to at least one of the following restriction categories: (1) 'radars', (2) 'flight restrictions', (3) 'Natura 2000', (4) 'natural environment' and (5) 'landscape'. Even 30% of onshore wind projects are subject to two of these categories. These restrictions resulted in the permanent decommissioning of some of the wind farms, with a capacity reduction of 700 to 1000 MW (ADEME, 2020).

Political blockage of onshore wind project development. The North of France is the region where onshore wind energy has been massively developed and consequently, this region is saturated with the existing projects already, which makes it hard for new projects to find land here. In addition, this development is currently endangered due to the political orientation of certain presidents of agglomeration communities (presidents of agglomeration communities (*communauté d'agglomération*)). Due to this political opposition to the development of onshore wind projects, especially in the Haut-de-France region, the hands of the Prefects in charge of the final authorisation to operate 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE) are tied because opposition from the president of agglomeration communities prevents them from approving new projects. This results in a situation where currently more projects are filed with the municipalities than approved (Stakeholder 1, 2021).

Identified good practices

Technical solutions to promote coexistence between wind turbines and radars.

So-called stealth wind turbines, developed by the wind developer Vestas thanks to the technology of the company Qinetiq and used by the state-controlled utility EDF (*Electricité de France*), allow the wind turbines and radars to coexist without affecting the operation of the latter, because turbine blades are designed to minimize interference with radar systems. First connection requests of such new wind turbines have already been received by the Regional Departments for the Environment, Development and Housing (*Directions Régionales de l'Aménagement et du Logement* – DREAL) (ADEME, 2017).

Reduction of the military areas. Given the fact that the security constraints represent the biggest obstacle in the site selection for onshore wind, the French Civil Aviation Authority (*La Direction générale de l'Aviation civile* - DGAC) re-evaluated areas that might be suitable for wind energy development, namely 'Training sector at very low altitude' (*Secteur d'entraînement à très basse altitude* - SETBA) and 'Tactical flight sector' (*Secteur de vols tactiques* - VOLTAC) and thus, 13.3% of land was made available for the development of this technology (Ministère des Armées, 2019).

Strengthening a more transparent dialogue. France's national meteorological service (*Météo France*) has worked together with the company Qinetiq since 2015 on the development of a radar interference assessment tool predicting whether wind turbines

may interfere with weather radars. This tool was shared with wind energy developers in order to encourage a more transparent dialogue. A similar tool is currently being developed for the assessment of interferences with military radars (ADEME, 2017).

Willingness to include the population in the pre-planning stage of onshore wind projects. Even if there is no obligation to consider the opinions of local communities upstream of an onshore wind project, the Ethic Committee of the French Wind Energy Association FEE has set up an ethical charter. This charter stipulates for a greater consideration of the local community in order to encourage a transparent and broad communication so that the population can better understand the general framework of the development of a given project. Thanks to this informal impulse, parliamentary discussions should take place to provide for a legal basis to a public consultation in the pre-planning stage (Stakeholder 1, 2021).

Decentralised framework for the renewable energy projects. In view of the large number of stakeholders involved in the processing of applications for 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE), departmental renewable energy clusters (*pôle départemental des énergies renouvelables - pôle EnR*) have been set up in regions to encourage the development of renewable energy projects, including solar and wind energy. The aim of these departments is to offer a one-stop-shop to developers of projects that are likely to have a significant impact on the environment and human health and to assist the project developers with the regulations and requirements that are relevant for their projects (Marne, 2020). This decentralised framework allows for a more dynamic coordination and encourages a more transparent dialogue between the wide range of actors involved. This new organisational approach has encouraged the Ministry of Energy to systematically set up these renewable energy clusters in the French regions. Nevertheless, the success of these clusters is intrinsically linked to the commitment of the stakeholders involved. It has also happened that these *pôle EnR* have only worsened and further extended the application process for 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE) (Stakeholder 1, 2021).

2.1.2. Electricity production licence

This chapter focuses on the administrative conditions required for the electricity production licence of ground-mounted and rooftop PV installations. As far as wind onshore installations are concerned, the electricity production licence has been part of the integrated environmental permit since 2017. The integrated environmental permit is further described under the chapter "Administrative authorisation".

Process flow

Ground-mounted and rooftop PV

Electricity production installations are subject to an administrative licence regime (Art. L. 311-1, Code de l'Énergie). However, facilities, including PV installations, with an installed capacity of less than or equal to 50 MW are considered as authorised without the need to submit an application (art. D. 311-3 and R. 311-4, Code de l'Énergie).

PV installations with an installed capacity of more than 50 MW need to file an application to the Directorate General of Energy and Climate (*Direction Générale de l'Énergie et du Climat* - DGECE), more specifically to the Minister in charge of Energy. The application includes (art. R311-5, Code de l'Énergie):

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- In the case of a natural person: surname, first name and domicile;
- In the case of a legal person: name or company name, legal form, address of the registered office and capacity of the person signing the application;
- A note specifying the technical, economic and financial capacities of the applicant;
- The main characteristics of the electricity production installation, specifying at least the production capacity, the primary energies and production technologies used, the energy yields as well as the operating times (base, semi-base or peak) and the quantity of greenhouse gases emitted by this installation;
- The location of the production plant;
- A note on the energy efficiency of the installation compared to the best available technologies.

Once granted, this electricity production licence is non-transferable (art. R311-8 Code de l'Énergie).

The Minister in charge of energy shall arrange for the publication in the Official Journal of the authorisations granted. This publication shall contain information relating to the production capacity, the primary energies, the production techniques used and the location of the installation (art. R311-11-1, Code de l'Énergie). Also, the licence can be cancelled if the installation has not been commissioned within 3 years from its date of issue or if the installation was not operated during 3 consecutive years from its date of issue. An exception is made if this is due to *force majeure*, in which case the Minister in charge of Energy may extend this 3-years deadline; up to 10 years from the beginning of the additional 3 years granted (art. R.311-10 Code de l'Énergie).

Deadlines

The licence application is examined by the Minister in charge of Energy within a maximum of four months from the date of receipt. If no response is received within this period, this means the application is rejected (art. R311-7, Code de l'Énergie).

Detected barriers

According to the stakeholders interviewed for this report, the electricity generation licencing procedure is running smoothly in France and there are no particular difficulties with regard to this authorisation. No barriers related to this process step were identified.

Identified good practice

No good practice related to this process step were identified.

2.1.3. Administrative authorisation

Process flow

The duration and level of detail of the administrative authorisation procedure vary depending on the technology and the size of the installation.

Wind onshore

In order to shorten the duration and reduce the complexity of administrative procedures, the State established an integrated permitting regime for environmental authorisations, in force since 2017 – *L'autorisation environnementale* unique. This integrated environmental permit applies among others for 'classified facilities for the protection of the environment' (*installations classées pour la protection de l'environnement* - ICPE)

which are subject to the authorisation regime. This include wind onshore farms comprising at least one wind turbine generator with a mast height of 50 m or higher, as well as those comprising wind turbine generators with a height of between 12 and 50 m and a capacity of at least 20 MW (Annex I to art. R123-1, Code de l'Environnement).

This regime has facilitated the environmental authorisation procedure for the project developers enormously. Previously, this was a tedious and relatively costly process and resulted in a considerable drop in onshore wind energy projects (ADEME, 2017).

The aim of this integrated environmental permit is to allow several administrative authorisations to be examined in one shot by a single body (the Prefect), while guaranteeing the same level of compliance with the provisions specific to each single authorisation. This integrated procedure reduces the total time required to process applications for authorisation to 18 months, instead of approximately 30 months before 2017 (FEE, 2021).

The integrated environmental permit combines various permits required for the erection of wind onshore installations in a single procedure. These include (Art L181-2, Code de l'Environnement):

- Authorisation to operate 'classified facilities for the protection of the environment' (installations classées pour la protection de l'environnement - ICPE) (art. L511-1, Code de l'Environnement);
- Authorisation for wood clearing (art. L213-13 et L.341-3 Code forestier);
- Exemption to the prohibition against destruction of protected species (art. L411-2 Code de l'Environnement);
- Absence of opposition to the projects that might impact Natura 2000 sites (art. L414-4 Code de l'Environnement);
- Special authorisation to carry out works in an area classified as natural reserve (*réserve naturelle*) (art. L. 332-6 and L. 332-9 Code de l'Environnement);
- Authorisation to carry out works in a classified site (*site classé*) (art. L. 341-7 et L. 341-10);
- Electricity production licence (art. L311-1 Code de l'Energie);
- Approval for the construction of transmission and distribution facilities (art. L323-11 Code de l'Energie).

In addition, the project developer is required to carry out an impact assessment (*étude d'impact*) for his wind energy project. This is a comprehensive assessment of the project's impact on the environment and biodiversity, local residents, the landscape and local heritage. These studies are carried out by independent consultancies (art. L122-1 Code de l'Environnement).

The environmental impact study is accompanied by a hazard study, in accordance with the regulations on 'classified installations for environmental protection' (*installations classées pour la protection de l'environnement - ICPE*), which cover wind energy plants (art. L181-25, Code de l'Environnement). This study specifies the hazards that the installation may cause directly or indirectly in the event of an accident, whether the cause is internal or external to the installation. These hazards may affect the neighbouring population, nature or protected sites. This study produces a risk analysis that takes into account the probability of occurrence, the kinetics and the severity of potential accidents (art. L181-25, Code de l'Environnement).

The application documents for the single environmental permit can be submitted to the Prefect in electronic form or in paper.

Ground-mounted PV

The installation of a ground-mounted PV project is subject to several town planning and environmental regulations.

Town planning procedures: The applicable procedures under the town planning code depend on the capacity of the installation. Installations of more than 250 kWp must obtain a building permit (art. R.421-9 Code de l'Urbanisme). The application for a building permit is submitted to the town hall and includes among others the following documents:

- Location plan of the land (art. R. 431-7 a Code de l'Urbanisme);
- Graphical document showing how the project fits into its environment (art. R. 431-10 c Code de l'Urbanisme);
- Notice describing the land and presenting the project (art. R. 431-8 Code de l'Urbanisme);
- Impact study of the project as defined by the Environmental Code (art. R. 431-16 a Code de l'Urbanisme).

If the PV project is located within the 500 m protection perimeter of a listed building, the project must be submitted to the French Architectural Review Board (Architectes des Bâtiments de France - ABF) for advice. In case of co-visibility between the protected monument and the PV installation, the ABF issues an opinion (approval or rejection) to which the town hall in charge of the project application must conform. If there is no co-visibility between the listed monument and the PV installation, the competent town hall is not bound to follow the opinion (approval or rejection) of the ABF. In most cases however, the town hall does follow the opinion of the ABF, since it is the opinion of the ABF that is used as a reference in the event of litigation between the applicant and the competent authority (HESPUL, 2018).

Environmental procedures: Ground-mounted PV installations with a capacity of more than 250 kWp are subject to an environmental impact study (art. R122-3 and R122-20, Code de l'Environnement). In addition, installations for which part of the project is located within a Natura 2000 site must be subject to a 'Natura 2000 impact assessment' to be added to the environmental impact study (art. R122-20, Code de l'Environnement). Furthermore, the environmental impact study must address aspects related to erosion and runoff risks. Finally, more specific information must be submitted for projects located in flood zones, wetlands, etc. (art. R 122-3, Code de l'Environnement).

Ground-mounted PV plants with a capacity of more than 250 kWp are also subject to a public enquiry (art. 123-8, Code de l'Environnement). The public enquiry is led by the so-called investigating commissioner (*commissaire enquêteur*). The file submitted to public enquiry includes the following documents

- the environmental impact study.
- the opinion of the competent environmental authority. Depending on the specific application, the designated environmental authority may be e.g. the Minister in charge of Energy or the Prefect.

The competent authority for the environmental procedures is the Regional Department for the Environment, Development and Housing (*Directions Régionales de l'Aménagement et du Logement – DREAL*) of the project location.

Rooftop PV

Any installation that results in a modification of the external aspect of an existing building requires a prior declaration procedure (art. R.421-17 and art. *R421-13, Code de

l'Urbanisme). Therefore, PV rooftop projects on existing buildings only require a prior declaration.

For rooftop PV projects on new buildings, it is necessary to integrate the project in the standard building permit application (art. *R421-1, Code de l'Urbanisme).

For buildings with a floor area of more than 1000 m², the construction concept must include either a renewable energy production process or a vegetation system. The renewable energy production system (such as a rooftop PV installation) must cover at least 30% of the total surface area of the roofs and shades (in the case where the building has a car park). The constructions concerned by this obligation are the following (art. L111-18-1, Code de l'Urbanisme):

- new buildings subject to a commercial permit;
- new constructions of industrial or craft premises, warehouses, hangars not open to the public and subject to a commercial operation;
- new covered car parks accessible to the public.

If the PV project is located within the 500 m protection perimeter of a listed building, the project must be submitted to the French Architectural Review Board (Architectes des Bâtiments de France - ABF) for advice. In case of co-visibility between the protected monument and the PV installation, the ABF issues an opinion (approval or rejection) to which the town hall in charge of the project application must conform. If there is no co-visibility between the listed monument and the PV installation, the competent town hall is not bound to follow the opinion (approval or rejection) of the ABF. In most cases however, the town hall does follow the opinion of the ABF, since it is the opinion of the ABF that is used as a reference in the event of litigation between the applicant and the competent authority (HESPUL, 2018).

The prior declaration or the application for building permit are submitted to the local town hall.

Deadlines

Wind onshore

Once the application for an integrated environmental permit has been submitted, the procedure is as follows (Green Univers, 2016):

- An examination phase of 4 months (+ 1 month if the notice of a national authority is required). The application for authorisation may be rejected.
- A public enquiry phase of approximately 3 months, during which the competent local authorities are also consulted.
- A decision phase of 2 months (+ 1 month if the prefect consults the competent departmental commission). Once this period has elapsed, the administration's silence is considered to be a rejection of the environmental authorisation application.

An appeal is possible within a period of 2 months for the project developer and 4 months for third parties. In this respect, the integrated environmental permit makes it possible to limit the risks of litigation since it can only be the subject of a single appeal, whereas previously the various authorisations could be challenged individually, each within different time constraints (Green Univers, 2016).

Ground-mounted PV

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Once the applications for a ground-mounted PV project over 250 kWp has been submitted to the competent authority (e.g. town hall or Prefect), the procedure is as follows:

- Within 1 month upon receipt of the application for building permit, the competent authority may notify the applicant about any missing documents (art. R.* 423-5 Code de l'Urbanisme). The applicant shall submit the missing documents within 3 months (R.*423-39, Code de l'Urbanisme).
- Within 1 week upon receipt of the application, the competent authority transmits the application to the concerned parties affected by the project (natural reserves, historical monuments, neighbouring municipalities etc. (art R* 423-7 – R*423-13-2, Code de l'Urbanisme). This includes the French Architectural Review Board (Architectes des Bâtiments de France - ABF), in the case where its opinion is required (art. R. 423-11 Code de l'Urbanisme). The opinion (approval or rejection) of the ABF shall be submitted to the competent authority within 2 months.
- Within 1 week upon receipt of the application, the competent authority transmits the application including the environmental impact study to the designated environmental authority. The environmental authority submits its opinion to the competent authority within max 3 months (art. R122-7, Code de l'Environnement).
- The competent authority determines the start of the public enquiry. The duration of the public enquiry may vary between 30 and 45 days (art. L. 123-9, R.*423-57 Code de l'Environnement). The investigating commissioner leading the public enquiry shall submit its conclusions on the project within 1 month after the end of the public enquiry (art. R*423-57, Code de l'Urbanisme).
- Within 3 months upon receipt of the conclusions from the investigating commissioner leading the public enquiry, the competent authority submits its final decision (art. R*423-20, R*423-23, Code de l'Urbanisme). Once this period has elapsed, the silence of the competent authority is considered as a rejection of the application.

Rooftop PV

In general, the examination period by the town hall is 1 month for a simple prior declaration for existing buildings and 2 months for a building permit for an individual house (new building) (art. R*423-23, Code de l'Urbanisme).

In case of a building permit, the competent authority transmits the application within 1 week to the French Architectural Review Board (Architectes des Bâtiments de France - ABF), in the case where its opinion is required (art. R. 423-11 Code de l'Urbanisme). The opinion (approval or rejection) of the ABF shall be submitted to the competent authority within 2 months.

Detected barriers

Delays due to constant requests for complementary information. Despite a prescribed deadline for the admissibility of the application for an integrated environmental authorisation, the competent administrative authorities, whether the Prefect or the Regional Department for the Environment, Development and Housing (*Directions Régionales de l'Aménagement et du Logement – DREAL*), may request additional information (content) to be added to the application file. Such requests for adjustment lead to significant delays in obtaining the final approval (Stakeholder 1, 2021).

Lack of staff in the competent authorities causing delays. Even if the integrated environmental permitting regime provides for an accelerated and simplified procedure, the fact remains that the application files are very extensive and complex and thus require great care from the competent authorities. Due to the shortage of staff in these authorities, as highlighted by the interviewees for this report, the project developers may face significant delays despite the set procedural deadlines (Stakeholder 1, 2021).

Lack of expertise among some competent authorities to guide the administrative process. The integrated environmental authorisation procedure was implemented in 2017 as a simplification process benefitting to wind onshore projects. However, after 5 years of implementation, the processing of applications remains a complex and tedious task, so that interviewees still point out difficulties related to the lack of the expertise of the competent authorities, in particular the employees responsible for the decision on the admissibility of the applications, i.e. whether an application is complete and may go through the examination process. In addition, it is pointed out that sometimes the same person is in charge of assessing applications for wind and solar projects. Although they are similar in terms of the administrative procedure, their impact and characteristics may vary due to their technological specificities, but these are not taken into account by the expert in charge of evaluating them (Stakeholder 2, 2021).

Identified good practice

Online application. Before 2020, the extensive application for environmental authorisation was mainly submitted to the competent authorities in paper form. However, due to the COVID-19 pandemic in particular, the application can now be submitted completely online, which makes the transmission of data and communication with the competent authorities more fluid (Stakeholder 1, 2021).

2.1.4. Grid connection permit

Process flow

Electricity producers are contractually entitled against the grid operator to the connection of renewable energy plants to the grid (art. L111-91, Code de l'Énergie). Hence, the grid operator is obliged to accept all electricity produced by renewable energy plants (art. 10 Loi 2008-108). The Grenelle II Law (Law n°2010-788) introduced two new complementary spatial planning instruments, supposed to facilitate the development of renewable energies. The first one - the Regional Climate, Air and Energy Plans (*Schémas Régional du Climat, de l'Air et de l'Énergie* - SRCAE) is adopted by the regional Prefect, following approval by the regional council. The SRCAE is a strategic document which among other things sets out the objectives for renewable energy development. These plans are adopted in all French administrative regions. The second instrument with the relevance for renewable energy projects is the regional grid connection plan for renewable energies (*Schéma régional de raccordement au réseau des ENR* - ENR'S3EnR). As mentioned in section 2.1.1, the aim of the regional grid connection plans is to reserve certain network capacities for renewable energy projects and to bundle the grid connection costs between various electricity producers within a region in question (RTE France, 2021). They are based on the objectives set in the SRCAEs and are drawn up by the transmission grid operator RTE, in collaboration with the distribution network operators (DSOs) – the main national operator Enedis and local DSOs, and in agreement with the Regional Departments for the Environment, Development and Housing

(*Directions Régionales de l'Aménagement et du Logement – DREAL*) (art. L321-7, Code de l'Énergie).

In the event of a connection request falling within the scope of the ENR'S3EnR, the grid operator suggests a grid connection solution to the project developer, taking into consideration such criteria as the distance, the costs, and the grid capacity (art. D342-23, Code de l'Énergie). The ENR'S3EnR is recognised as a tool that increases the visibility of the nearest connection point. However, even if the nearby grid connection point is identified, it may lack capacity to transfer the intended amount of power. Therefore, amendments to the ENR'S3EnR are sometimes needed (art. D321-20-1 to 4, Code de l'Énergie), which is the responsibility of the transmission grid operator RTE. Amendments by RTE will then be submitted to the regional Prefect and to the relevant stakeholders mentioned in article D231-12 of the Energy Code.

Once the environmental authorisation has been granted, the project developer must submit a grid connection request. The procedure varies depending on whether the renewable energy plant is to be connected to the high voltage or the low voltage grid, respectively under the competence of the transmission grid operator RTE or the distribution grid operators. The responsible grid operator will also vary according to the installed capacity. Thus, if the installed capacity of the technology in question is less than 12 MW, the project developer will need to submit the request to the national DSO Enedis or any other local DSO (*Entreprises locales de distribution - ELD*). If the installed capacity exceeds 12 MW, the application must be sent to the transmission system operator RTE (Arrêté du 9 juin 2020). The project developer must complete a standard application form and submit the planning permission for the renewable energy plant. The application is then included in a waiting list.

The grid connection procedure for installations to be connected to the transmission grid is explained in the following steps (RTE, 2019):

- The project developer has the possibility to apply for a free and optional preliminary grid connection study (*étude exploratoire*) that estimates the feasibility, costs, and the timeframe for connecting the facility. Once the request for an preliminary grid connection study has been submitted, RTE, within 8 days of receiving it, informs the project developer if any information is missing. Then, within 6 weeks of receiving the complete request, RTE sends to the developer the results based on the information provided in the request. The preliminary grid connection study allows the project developer to identify the optimal grid connection solution at an early stage, prior to the application for the grid connection offer (*Proposition technique et financière - PTF*). Furthermore, the costs and deadlines within the preliminary grid connection study are not binding (RTE, 2019).
- The application for a grid connection offer is a mandatory step in the grid connection process. The offer (*Proposition technique et financière - PTF*) contains information on the grid connection conditions, i.e. the technical description of the project, its costs as well as its maximum completion time. The project developer submits the application for a grid connection offer to RTE, which, within 8 days of receipt, indicates if, and if yes, which documents or information are missing. From the moment when the request is considered complete, RTE has 3 months to carry out a grid connection study and submit the grid connection offer to the project developer (art. 342-2, Code de l'Énergie). However, this timeframe may be changed with the written agreement of the developer, depending on the complexity of the project. The grid connection offer therefore commits RTE to the amount of the cost of the connection as well as to the completion date.

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- The grid connection offer is then sent to the developer by registered mail (with acknowledgement of receipt), who then has 3 months to accept the offer (art. 342-2 Code de l'Énergie). If accepted, the project developer returns a signed copy of the offer to RTE, in line with the timeline set out in the offer. The project developer has to bear the costs of the studies and eventually, the grid connection (RTE, 2019).
- Once the grid connection offer has been accepted by the project developer, RTE initiates the detailed technical studies, the administrative procedures and the consultation required to connect the project to the grid. To this end, RTE is required to send the project developer a draft connection agreement (art. L342-4 Code de l'Énergie) at the latest 6 months after the end of the administrative procedures, as well as technical draft specifications 6 months after acceptance of the offer. The project developer has 3 months to accept the connection agreement upon its receipt (art. 342-2 Code de l'Énergie). This acceptance must be realised before the start of the grid connection work. If the acceptance is not received during this period, the agreement and the signed grid connection offer are considered void and the connection request is not considered (RTE, 2019).
- In addition, before the installation is commissioned, the Operation and Control Agreement (*Convention d'Exploitation et de Conduite*) and the Transmission System Access Contract (*Contrat d'Accès au Réseau de Transport - CART*) must be signed. The Operation and Control Agreement defines the responsibilities of each party to ensure that the installation is properly connected to the grid. In addition, it establishes the operating and control rules that must be respected by each of the contracted parties to guarantee the safety and security standards (RTE, 2019). The CART defines the commitments between the applicant and RTE about metering, subscribed power, planned interruptions for maintenance reasons and electricity quality. CART also establishes the conditions of responsibility, pricing, and invoicing (RTE, 2019).

As far as the connection to the distribution grid is concerned, the procedure is composed of the following steps⁷ (HESPUL, 2018):

- The applicant submits a request for grid connection to the DSO, either in paper form or online. At this stage, the applicant specifies whether he plans to inject part or the totality of his electricity production into the distribution grid. In addition, the applicant also specifies whether he wants to benefit from the feed-in tariff for his produced electricity. In case a feed-in tariff is requested, Enedis informs the competent authority EDF OA, which then contacts the applicant with a feed-in tariff contract.
- Within 10 days upon receipt of all the application documents, the DSO notifies the applicant that the application is complete.
- Within 1-3 months upon receipt of the complete application, the DSO sends a grid connection estimate (*proposition de raccordement - PDR*), together with the contract for grid connection, access and operation (*contrat de raccordement, d'accès au réseau et d'exploitation - CRAE*).
- The applicant must accept the grid connection estimate and sign the contract for grid connection within 3 months upon receipt, otherwise the grid connection request lapses.
- The applicant must commission his installation within 2 years upon conclusion of the grid connection works by the DSO (or 18 months upon receipt of the complete

⁷ These steps are set out by the main distribution grid operator Enedis, which is responsible for 95% of the distribution grid in France. Some differences may apply for the grid connection procedures with the other local DSOs.

application for grid connection by the DSO), otherwise the grid connection requests lapses.

Deadlines

The detailed deadlines for the connection of renewable energy plants to the transmission and the distribution grid are described above in the process flow.

Detected barriers

Ageing of the grid at national level. Across the country, the electricity grid is facing considerable ageing where the infrastructure is in poor condition, revealing chronic financial underinvestment. Indeed, whether for the transmission or distribution grid, it is no longer able to respond to all grid connection requests, resulting in a lack of efficient project implementation. This situation is particularly critical in rural areas where the grid is inadequate and connection costs are even higher. At the current rate of grid renewal of 1% per year, it would take at least a century for a general renovation of the French grid which would be very problematic given the increased number of projects which are awaiting grid connection (Stakeholder 2, 2021).

Delay in obtaining grid connection. There are currently delays beyond the planned deadline in the grid connection up to several months. Due to the current grid saturation, especially in the north of the country with the largest number of wind farms and in the south of the country with the largest accumulation of solar projects, many project developers complain about the delay in connecting their project. This delay is especially present between the acceptance of the connection offer and the actual grid connection (Stakeholder 2, 2021).

Scarcity of access points. As the grid is facing saturation throughout the country, it is becoming difficult to find available grid connection points. Even if a grid connection point can be found at the time of site selection, it may later become unavailable, resulting in a complex situation for the project developer who must then bid for a new available point. In other words, due to the lack of available grid connection points, project developers struggle to have a clear planning of their projects (Stakeholder 2, 2021).

Increasing grid connection costs. Grid connection costs are a determining factor in the development of a renewable energy project and it appears that these costs are constantly increasing over the years. This currently represents a significant barrier for project developers. Many interviewees are concerned that this increase in grid connection costs could significantly reduce the number of projects throughout France (Stakeholder 2, 2021).

No upstream institutional planning. The electricity grid in France already faces many difficulties, as presented above. Nevertheless, no initiative has yet been taken by either regional or national authorities to renovate the electricity grid, fearing a worsening of the situation in the coming years. In this respect, the Multiannual Energy Plan (*programmation pluriannuelle de l'énergie* - MEP) does not mention any developments in this direction, which leaves many project developers in a state of disarray as they fear that if no action is taken at present, grid connection will present an insurmountable barrier in the future (Stakeholder 2, 2021).

Identified good practice

Planning tool and visibility - S3REnR. The Grenelle II Law introduced the Regional grid connection plan for renewable energies (*Schéma régional de raccordement au réseau des ENR* - ENR'S3REnR) to accelerate the connection to the electricity network and,

moreover, to mutualise the costs throughout the territory. This planning tool enables the Regional Departments for the Environment, Development and Housing (*Directions Régionales de l'Aménagement et du Logement – DREAL*) and project developers to closely monitor the development of the electricity network throughout the country. In addition, these plans provide planning and anticipation of grid connections (France Nature Environment, 2019; Stakeholder 2, 2021).

3. Use of IT systems

In recent years, the administrative authorities have taken steps to make the administrative processes more digital. This leap forward was pushed in particular because of the COVID-19 crisis. Especially, since the beginning of 2021, administrative procedures can be completely handled online i.e., submitting all the required permits within one step. Before that, only some authorisations of the administrative procedure could be submitted online, next to the paper submitting. Nevertheless, despite this improvement toward a digitalisation of the administrative procedure, some technical issues must be improved. As a matter of fact, as the content of the application for an integrated environmental permit is very consequent, the size of the file can sometimes cause technical problems on governmental online portals. For this reason, improvements are still needed to further simplify the sending of electronic files via the internet (Stakeholder 2, 2021).

Spatial Planning. Spatial planning documents organising the French territory can be found on the official website of the Ministry of Territorial Cohesion and Relations with Territorial Communities⁸. Because they are available online, project developers can easily consult them before the development of a wind or solar project.

Grid connection tool - ENR'S3EnR. The ENR'S3EnR tool is a platform available on the website of the transmission grid operator RTE containing information on the entire network, depending on the administrative region. Among other things, the platform⁹ also contains geolocation data, which are easily accessible during the entire administrative procedure or even, at the site selection stage (RTE, 2021).

Integrated environmental authorisation. To facilitate the application for the integrated environmental authorisation, the project developer can upload a document containing all the required information, i.e., all the necessary permits on the internet. Then, depending on his choice, he can submit his authorisation in paper or electronic format to the Regional Department for the Environment, Development and Housing (*Directions Régionales de l'Aménagement et du Logement – DREAL*)¹⁰.

Public enquiry during the administrative procedure. Due to the impact of the COVID-19 pandemic, the public consultations taking place during the administrative procedure were strongly affected by the fact that no physical meetings were possible. As a result, the online meetings have been used, but with limited success. Indeed, this lack of a physical meeting proved to be detrimental. This cause generational inequalities, as older people are less inclined to use systematically online communication tools. In addition, there were significant delays in the public consultations, as they all had to be postponed due to COVID-19 (Stakeholder 2, 2021).

⁸ <https://www.cohesion-territoires.gouv.fr/documents-durbanisme>

⁹ <https://www.rte-france.com/projets/les-schemas-regionaux-de-raccordement-au-reseau-des-energies-renouvelables-des-outils-0>

¹⁰ http://www.bourgogne-franche-comte.developpement-durable.gouv.fr/IMG/pdf/annexe_check-list_aeu_vf_cle58c2a4.pdf

4. Complaint procedure

Installations requiring a building permit (e.g. ground-mounted PV projects): In case a building permit is refused by the competent authority, the applicant must send, within 2 months of the refusal, a registered letter with acknowledgement of receipt to ask the competent authority to review its position (*recours gracieux*). If this does not succeed, the applicant can then take legal action to the Administrative Tribunal within 2 months upon notification of the refusal of the competent authority (*recours contentieux*) (art. R600-1 to R600-7, Code de l'Urbanisme).

Installations benefiting from the integrated environmental authorisation regime (e.g. onshore wind projects): The introduction of the integrated environmental permit has made it possible to limit the risks of litigation since the permit can only be appealed once, within a period of 2 months from the notification of the refusal decision for the project developer and 4 months for third parties, from the publication of the decision by the competent authority (art. R181-50, Code de l'Environnement). Previously, the various authorisations could be challenged individually, each within different time limits. In fact, decree of 29 November 2018 reduces the time foreseen for appeal procedures by entrusting the administrative courts of appeal with the processing of disputes in the first and last instance for projects authorised from 1 January 2019 (décret du 29 novembre 2018). This applies both to appeals against authorisations and to rejections of wind energy projects. In other words, this allows to avoid the preliminary stage of the administrative court, while leaving the possibility of an appeal to the Council of State. This enables to gain time in the overall appeal procedure, knowing that each of these levels of jurisdiction, needs approximately 2 years of examination (FEE, 2021).

In case a project is being appealed: Whatever the period of validity attached to the building permit, it is preserved in the event of postponement of the implementation of the work for regulatory or contentious reasons. Thus, when the permit is the object of an administrative or judicial appeal, its period of validity is preserved until the pronouncement of an irrevocable judicial decision (R. 423-19, Code de l'Urbanisme).

Installations connected to the transmission grid: In the event that the applicant wishes to postpone the implementation of his connection once the grid connection offer has been signed, for example in the event of legal action against his project, he may ask the transmission grid operator RTE to suspend the studies and administrative procedures. As of receipt of this information (RTE, 2019):

- RTE ensures that the sums paid by the applicant as part of the advance payments cover the costs already incurred. If this is not the case, RTE shall ask the applicant to pay the sums required to cover these costs;
- RTE and the applicant agree, in an amendment to the grid connection offer, on the revision of the conditions for the connection, specifying in particular the estimated duration of the temporary suspension of the connection procedure, the consequences on the schedule, the consequences on the costs and the payment schedule.

The suspension of the procedure may not exceed a maximum period of one year, renewable once; after this period, RTE shall inform the applicant that the processing of its connection request is terminated (RTE, 2019).

5. Specific features to ease administrative procedure

Table 2 below provides information on the existing specific features to ease administrative procedures in France.

Table 2: Specific features to ease administrative procedures

Specific feature	Existing	Short description
Simultaneous procedures	yes	Since March 2017, wind onshore projects benefit from an integrated environmental authorisation procedure, which covers different permits falling under the Code of Environment, Forestry Code, Energy Code, Transport Code, Defence Code and Heritage Code (Green Univers, 2016).
National contact points and one-stop-shops	yes	Since March 2017, wind onshore projects benefit from an integrated environmental authorisation procedure (Green Univers, 2016). The application for the integrated environmental authorisation shall be submitted to the Prefect. Since 2021, all applications are submitted electronically. Public hearings for all the processes are organised simultaneously, and the decision on the approval of the project is given at the end of the procedure.
Application of 2+1 and 1+1 rules	yes	The French regulations do not mention explicitly the 2+1 or 1+1 rules. However, the deadlines set out for the permit-granting process of wind onshore, ground-mounted and rooftop PV installations do comply with these time limits. For wind onshore projects, the integrated environmental permitting procedure reduces the total time required to process applications for authorisation to 18 months, instead of approximately 30 months before (FEE, 2021). For ground-mounted PV projects, the total examination time of permitting applications is of 7 months, as estimated by the ministries of Ecological Transition and of Territorial Cohesion (Ministère de la Transition Ecologique et Solidaire, Ministère de la Cohésion des Territoires). Finally for rooftop PV projects, the deadlines are much shorter, approx. 6 months as estimated by the renewable energy association HESPUL (HESPUL, 2020).
Simple notification procedure	yes	PV rooftop projects on existing buildings only require a prior declaration, to be submitted to the local town hall (art. *R421-13, Code de l'Urbanisme).
Pre-planning	no	
Pre-application consultation	yes	Even if there is no legislation requiring the project developer to undertake a pre-consultation before the start of the project, the fact remains that during the selection of a suitable site, consultation with the population is often undertaken on a voluntary basis. An ethical charter, created by the association of local communities AMORCE and the French Wind Energy Association FEE (<i>France Energie Éolienne</i>), encourages and encourages project developers to engage in a dialogue with local residents who could be impacted by the development of renewable energy projects in their neighbourhood. This informal incentive allows for a transparent and

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		dynamic dialogue to be undertaken to reduce potential civil opposition during the development of the project.
Project acceptance measures	no	
Measures to streamline litigation by third parties	no	
Other	no	

6. Indicators to measure the performance of the overall process

Table 3 below provides information on the indicators to measure the performance of the overall administrative and grid connection process in France.

Table 3: Performance indicators to assess administrative and grid connection processes

Performance indicator	Description
Average response time by the competent authorities and TSO/DSO for grid connection procedures	<p>The response time for the electricity production license amounts to approx. 4 months for all renewable energy sources.</p> <p>The integrated environmental permit for onshore wind projects involves a response time of 2 to 5 months from the competent authorities, upon submission of a complete application file (Green Unifers, 2016). However, interviewees underlined the significant additional time and information needed until a file is considered complete by the competent authorities (Stakeholder 1, 2021).</p> <p>Regarding the application for building permit or prior declaration for ground-mounted and rooftop PV, the response time of the competent authorities amounts to 1 to 3 months depending on the procedure and the complexity of the project (art. R.* 423-5, art. R*423-20, R*423-23, Code de l'Urbanisme).</p> <p>The connection to the grid starts after the project developer received the administrative authorisation. For connections to the distribution grid, the response time of the DSO varies between 1-3 months upon receipt of the complete application (HESPUL, 2018). For connections to the transmission grid, the response time of the national TSO RTE varies between 3 and 6 months depending on the procedure step (RTE, 2019).</p>
Process duration	<p>According to the regulations in force and following estimates from the RES associations, the total process duration for wind onshore projects varies between 21 months and 3.5 years, depending on the complexity of the project (6-12 months site selection, 9-11 months for the integrated environmental permit, 6-18 months for the grid connection).</p> <p>According to the estimates from RES associations and the regulations in force, the process duration for ground-mounted PV projects over 250 kWp varies between 12 and 18 months (2-6 months site selection, 4 months for obtaining the electricity production licence, 6-8 months for the building permit).</p> <p>Finally for rooftop PV projects, the process duration as set out by the regulation in force and estimated by national RES associations amounts to between 7 months and 1 year (2-6 months site selection, 4 months for obtaining the electricity production</p>

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	<p>licence, 1-2 months for the administrative procedures respectively for existing and new buildings).</p> <p>However, in practice, due to the lack of staff and the frequent requests for additional information from the competent authorities, the process duration for permitting procedures of wind onshore, ground-mounted and rooftop PV projects is significantly extended (Stakeholder 1, 2021).</p>
Project approval rates	N.A.
Costs of administrative processes	N.A.
Share of permits that are legally challenged	According to the national wind association FEE, around 2/3 of wind onshore projects are subject to appeal (FEE, 2021).
Share of legal challenges that are overruled	N.A.
Stakeholder interests	Most administrative processes, including spatial planning and environmental impact assessment, include compulsory stakeholder hearings and are codified in all relevant pieces of legislation. The relevant stakeholders are required to be notified as the administrative process starts and to comment on the planned project before any decisions are made. In all but the integrated environmental authorisation, these rights are relatively wide and almost all actors in the area count as stakeholders, varying from environmental organisations to local residents. Also, the stakeholders have the right to appeal the permitting decision once it has been made.

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¹¹ The name of those interviewees who wanted to remain anonymous has been replaced throughout the report by the mention "Stakeholder 1" for wind onshore experts and by "Stakeholder 2" for PV experts.

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