The Law of Renewable Energies in France

Louis de Fontenelle

A. Introduction

When it comes to renewable energies, France stands out from the other Member States of the European Union because of the central role played by nuclear power.[1] To fully understand the specific issues involved in accelerating the production of renewable energies, we need to situate them in relation to nuclear energy.

The time has come to revive the nuclear industry. In his Belfort speech on 10 February 2022, Emmanuel Macron said: "*ce que nous avons à bâtir aujourd'hui, parce que c'est le bon moment, parce que c'est ce qu'il faut pour notre nation et parce que les conditions sont maintenant réunies, c'est la renaissance du nucléaire français*" ("*what we have to build today, because it is the right time, because it is what is needed for our nation and because the conditions are now in place, is the renaissance of French nuclear power*"[2]).[3] This political ambition led to the adoption of Law 2023–491 of 22 June 2023 on the acceleration of procedures relating to the construction of new nuclear facilities near existing nuclear sites and the operation of existing facilities.[4] The major changes introduced by this law are the removal of the target of a 50 % reduction in the share of nuclear power in the electricity mix by 2035,[5] the removal of the 63.2 gigawatt (GW) cap on nuclear gener-

1 Xavier Arnauld de Sartre/Justin Missaghieh-Poncet/Lise Desvallées, 'En France, l'acceptabilité sociale des technologies de décarbonation de l'énergie à l'ombre de la dépendance au nucléaire' (2022) 4 EEI.

2 The speech-marked parts in this book chapter were translated by the authors.

3 Emmanuel Macron, 'Reprende en main notre destin énergétique!' (Élysée 10 February 2022) <https://www.gouvernement.fr/upload/media/default/0001/01/2022_02_nucleaire_belfort.pdf> accessed 27 August 2024.

4 Law no. 2023–491 of 22 June 2023 on the acceleration of procedures relating to the construction of new nuclear facilities near existing nuclear sites and the operation of existing facilities, *JORF* no. 0144 of 23 June 2023, Text no. 1

5 Article 1 of the law amending Article L. 100–4 of the Energy Code.

ation capacity[6] and the simplification of procedures for the construction of EPR2 reactor projects (temporary simplification rules for a period of 20 years).[7]

Within this framework, renewable energies must find their place. The challenge is therefore one of coexistence between the nuclear and renewable energy sectors. Guillaume Dezobry described the various stages in the coexistence of renewable energies and nuclear power in France: Act 1 involved taking account of the arrival of renewable energies, Act 2 involved competition between nuclear and renewable energies, and Act 3 involved complementarity between nuclear and renewable energies.[8] Today, we are clearly moving towards Act 4, with a reaffirmed place for nuclear power and an additional role for renewable energies in the decarbonisation objective.

B. Definition of Renewable Energies

In France, the Energy Code defines renewable energies in Article L. 211–2 as follows.

> "*Energy produced from renewable sources, or 'renewable energy', is energy produced from renewable non-fossil sources, namely wind energy, solar thermal or photovoltaic energy, geothermal energy, ambient energy, tidal, wave or osmotic energy and other marine energy, hydroelectric energy, biomass, landfill gas, sewage treatment plant gas and biogas*".

6 Article 1 of the Act, which deletes Article L. 311–1 of the Energy Code, states that authorisation to operate any new electricity generation facility "may not be granted if it would have the effect of increasing the total authorised nuclear electricity generation capacity beyond 63.2 gigawatts".

7 Article 7 of the Act, which states that the rules in the section entitled "Measures Designed to Accelerate Procedures Relating to the Construction of New Nuclear Facilities near Existing Nuclear Sites" apply "to the construction of nuclear power reactors, including small modular reactors, which are planned to be located in the immediate vicinity of or within the perimeter of an existing basic nuclear facility mentioned in 1° to 3° of Article L. 593–2 of the Environment Code and for which the application for authorisation to create the facility referred to in Article L. 593–7 of the same code is submitted within twenty years of the promulgation of the present law".

8 Guillaume Dezobry, 'Mesures structurelles – Les investissements – La relance du nucléaire' (2023) 1 RFDA 34.

Since an order was issued in 2021[9], this definition has been in line with the European definition contained in Directive 2018/2001 (known as RED II[10]). Prior to this date, French law did not define renewable energies as opposed to fossil fuels.[11]

C. Legal sources

1. Provisions Common to Renewable Energies Under French Law

The main legal provisions relating to renewable energies are contained in Book II of the Energy Code, entitled "Managing Energy Demand and Developing Renewable Energies" (Articles L. 211–1 to L. 294–1).

In addition to these common provisions, French renewable energy law contains specific provisions for each renewable energy source to take account of their technical and economic characteristics. The purpose of the following is not to describe all the sectoral regulations, rather to give a general overview of the legal framework for renewables.

2. Developments in the French Legal Framework

(a) The Development of the Law Prior to the APER Act

The legal framework for the development of renewable energy sources has been gradually established since 2005. In recent years, there has been a

9 Order no. 2021–236 of 3 March 2021 transposing various provisions of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources and Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 concerning common rules for the internal market in electricity, *JORF* no. 0054 of 4 March 2021, Text no. 4.

10 Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable source [2018] OJ L 328/82.

11 The first version of the codification, prior to this ordinance, stated: "renewable energy sources are wind, solar, geothermal, aerothermal, hydrothermal, marine and hydraulic energy, as well as energy from biomass, landfill gas, gas from wastewater treatment plants and biogas. Biomass is the biodegradable fraction of products, waste and residues from agriculture, including plant and animal substances from land and sea, forestry and related industries, as well as the biodegradable fraction of industrial and household waste".

significant production of legislation, which can be explained by the desire of the public authorities to put in place a legal framework conducive to accelerating the production of renewable energy. This acceleration has also been in response to changes in European Union legislation and the obligation to implement directives under the Clean Energy Package.

- Law of 13 July 2005 on energy policy guidelines[12] (Title III – Renewable energies)
- Law of 3 August 2009 on the implementation of the Grenelle Environment Forum[13]
- Law of 12 July 2010 on the national commitment to the environment[14] (Chapter II Renewable energies (Articles 84 to 93).
- Law of 17 August 2015 on energy transition for green growth[15] (Title V – Promoting renewable energies to diversify our energy sources and make the most of our regions' resources Articles 104 to 122)
- Energy and Climate Act of 8 November 2019[16]
- Act of 22 August 2021 to combat climate change and build resilience to its effects[17] (Chapter IV – Promoting renewable energies, Articles 82 to 102)
- Law of 10 March 2023 on accelerating the production of renewable energy[18]
- Law of 23 October 2023 on green industry[19] (introduces new provisions, but only marginally, to enable the development of renewable energies)

Of course, all the regulatory provisions (decrees and orders) designed to apply and clarify French legislation must be added to this legislative framework.

12 Law no. 2005–781 of 13 July 2005 on energy policy guidelines, *JORF* no. 163 of 14 July 2005, Text no. 2.
13 Law no. 2009–967 of 3 August 2009 on the implementation of the Grenelle Environment Round Table, *JORF* no. 0179 of 5 August 2009, Text no. 2.
14 Law no. 2010–788 of 12 July 2010 on the national commitment to the environment, *JORF* no. 0160 of 13 July 2010, Text no. 1.
15 Law no. 2015–992 of 17 August 2015 on the energy transition for green growth, *JORF* no. 0189 of 18 August 2015, Text no. 1.
16 Law no. 2019–1147 of 8 November 2019 on energy and climate, *JORF* no. 0261 of 9 November 2019, Text no. 1.
17 Act no. 2021–1104 of 22 August 2021 to combat climate change and strengthen resilience to its effects, *JORF* no. 0196 of 24 August 2021, Text no. 1.
18 Law no. 2023–175 of 10 March 2023 on accelerating the production of renewable energy, *JORF* no. 0060 of 11 March 2023, Text No. 1
19 Law no. 2023–973 of 23 October 2023 on green industry, *JORF* no. 0247 of 24 October 2023, Text no. 1, Article 11, Article 17, Article 23.

The result is a complex legal framework, but also evolving and, therefore unstable:[20] "*D'innombrables retouches textuelles sont régulièrement adoptées, lorsqu'il ne s'agit pas de réformes plus profondes, qui témoignent du tiraillement constant du législateur [...] entre la volonté de promouvoir les énergies renouvelables et celle d'imposer un juste encadrement* "[21] ("*Numerous amendments to the text are regularly adopted, if not more far-reaching reforms, reflecting the legislator's constant tug-of-war [...] between the desire to promote renewable energies and the need to establish an appropriate framework.*")

This standards strategy aligns with developments in the European Union's legal framework to promote the development of renewable energies. French regulations incorporate and transpose European legislation.

However, despite this complex and evolving nature, there has been a turning point since the 2020s due to the combination of crises posed by COVID-19 and the war in Ukraine. The major difficulties experienced by energy systems and the serious questions relating to the security of supply in France and within the EU have led the State to adopt a very proactive strategy for the development of renewable energy (in conjunction with the reaffirmation of the role of nuclear power).

In other words, after a period of delay in the legal development of renewable energies, today's legal strategy is to facilitate the massive development of renewable energies in France. From this point of view, the most central law in this strategy is the APER law of March 2023.

(b) The APER Act of 2023

On 10 March 2023, the French Parliament adopted the law on accelerating the production of renewable energies. The main objective pursued by the French legislature is to encourage the quantitative development of renewable energy projects in order to make up for the delay in achieving the renewable energy production targets[22] and the formation of low-carbon industrial sectors compared with other European Union countries.

---

20 Marie Lamoureux, *Droit de l'énergie* (ed. LGDJ, 2nd edition, 2022) 462.

21 ibid.

22 Cour des Comptes, *Les soutiens à l'éolien terrestre et maritime. Exercices 2017 et suivants* (March 2023) 18. The Cour des Comptes observed: "France has not achieved the target set by Directive 2009/28/EC: final consumption of renewable energies (electricity and heat) amounted to 307 TWh in 2020. At 19.1 % of the total, up 10 %

The explanatory memorandum to the law sets out the reasons for this delay, focusing in particular on the cumbersome administrative procedures: "On average, it takes 5 years of procedures to build a solar farm requiring just a few months of work, 7 years for a wind farm and 10 years for an offshore wind farm. Our European partners often go twice as fast as we do. There are many reasons for this: the complexity of our administrative and litigation procedures compared with those of our European partners, a shortage of land that can be easily mobilised and reconciled with environmental issues, a lack of visibility over the planning process for offshore wind farms, problems with the acceptability and attractiveness of renewable energy projects, and a lack of ownership at local level. So we need to move much faster, without compromising our environmental requirements. Given the urgency of the situation in terms of climate and security of supply, temporary adjustments to speed up the implementation of projects are necessary for the energy transition".

The APER Act is structured as follows:

- Title I Measures to Promote the Use of Renewable Energies and their Integration into the Landscape (Articles 1 to 3)
- Title II Simplification and Territorial Planning Measures Aimed at Accelerating and Coordinating the Siting of Renewable Energy Projects and the Industrial Projects Needed for the Energy Transition (Articles 4 to 33)
- Title III Measures to Accelerate the Development of Solar, Thermal, PV and Agrivoltaic Energy (Articles 34 to 55)
- Title IV Measures to Accelerate the Development of Offshore Renewable Energy Production Facilities (Articles 56 to 66)
- Title V Measures Relating to Other Categories of Renewable Energy (Articles 67 to 85)
- Title VI Cross-sectoral Measures for Financing Renewable and Recovered Energy and Sharing the Value (Articles 86 to 103)
- Title VII Miscellaneous Provisions (Articles 104 to 116)

on 2005, it falls short of the 23 % target. It should be noted that France had accepted more ambitious targets for the introduction of renewable energy than most other countries, even though its electricity mix is highly decarbonised and the delay in achieving its targets is not attributable to the electricity mix alone, and particularly not to the wind power sector alone, but also to the insufficient reduction in overall energy consumption, including heating and transport".

The main measures contained in the APER Act[23] are aimed at achieving the following objectives:

- Simplification of administrative procedures to enable the development of renewable energy projects
- An original planning approach (renewable energy acceleration zones) to identify areas suitable for the development of renewable energy projects and to encourage social and territorial appropriation.
- Economic and financial support mechanisms to structure dedicated renewable energy sectors (offshore wind, PV solar, etc.)
- The introduction of legal mechanisms to ensure the legal and financial security of investments (long-term electricity and biogas sales contracts, for example).
- The development of a legal framework for offshore wind power[24] includes the introduction of a planning system (priority zones for the development of offshore wind power),[25] the introduction of a legal regime for floating wind power[26] and measures to provide economic and legal security for projects (such as the creation of a guarantee fund to compensate the operator for financial losses in the event of a court annulling a project authorisation decision).[27]
- The development of a legal framework for agrivoltaics, by drawing up a definition and implementing rules to prevent the risk of conflicts of use between farming and the production and use of energy.[28]

23 Christine Le Bihan-Graf/Pierre Jérémie, 'Les principales mesures de la loi relative à l'accélération de la production d'énergies renouvelables' (2023) 5 EEI study 11.

24 Nicolas Boillet/Gaëlle Guéguen-Hallouët, 'Principaux apports de la loi APER pour le déploiement des éoliennes en mer' (2023) AJDA 1179.

25 Article 56 of the APER law.

26 Article 63 of the APER law.

27 Article 24 of the APER law.

28 Article L. 314–36, Energy Code. Benoit Grimonprez, 'L'agrivoltaisme à la lumière du droit' (2023) AJDA 1168; Victoire Martin, 'Agrivoltaïsme : entre incitation et régulation – Regards croisés sur un droit en construction. – Note à partir des travaux du colloque au Palais du Luxembourg du 7 avril 2023' (2023) 11 EEI study 25.

D. Planning

1. National Planning

France has put in place a planning framework based on incorporating national objectives into local planning documents, which is ultimately translated into the development of renewable energies on the ground. The strategy is set first and foremost at the national level as part of an energy and climate programming law provided for in L.100 – 1, A of the Energy Code: the text stipulates that before 1er July 2023, and every 5 years after that, a law must determine and set the objectives of the national energy policy to respond to the ecological and climate emergency. This law must specify, in particular, "3°The objectives for developing and storing renewable energies for electricity, heat, fuel, gas and renewable and low-carbon hydrogen, for two successive five-year periods. In the case of hydroelectricity, the development and storage targets relate to changes in the production capacity of hydraulic installations, authorised and licensed in application of Article L. 511–5, as well as pumped storage stations".

The objectives set out in this law must be incorporated into the multi-annual energy programme (hereinafter referred to as the PPE), the content of which must be compatible with these objectives.[29] The PPE, provided for in L. 141–1 of the Energy Code, is set by decree and defines the terms and conditions for the public authorities' action in managing all forms of energy in France. This planning document, created by the 2015 TECV law (Loi de Transition Énergétique pour la Croissance Verte), has replaced the previous planning documents (Pluriannual et al. for electricity production, Pluriannual Investment Programme for heat production, Pluriannual Indicative Investment Plan for the gas sector). There is one document for mainland France and one for each non-interconnected zone. The document consists of a decree adopting the PPE, which also defines the main objectives and priorities for action, a report, and an explanatory summary of these guidelines and actions, accessible to the public. This PPE must be compatible with the programming law provided for in L. 100–1, A, and the objectives defined in L. 100–1, L. 100–2 and L. 100–4 of the Energy Code.

- Article L. 100–1 defines the main objectives of energy policy (competitiveness of the economy, security of supply, competitive and attractive energy prices, protection of human health and the environment, social

29 Article L. 100–1 A, Energy Code.

and territorial cohesion, combating fuel poverty, participation in the European Energy Union).

- Article L. 100–2 concerns the involvement of local and regional authorities and their groupings in achieving energy policy objectives. In particular, they are required to diversify energy supply sources by reducing the proportion of fossil fuels, diversifying energy production sources in a balanced way and increasing the proportion of renewable energy sources in final energy consumption.

For the time being, the new national energy policy has still not been implemented, despite the July 2023 deadline mentioned in Article L. 100–1 A. Legislation – a bill and a decree publishing the new PPE – is under consideration.

Today, the objectives for developing renewable energy sources are therefore partly contained in the law at L. 100–4 and partly in the PPE (see above, 4° to 4°, bis, ter, quart and 8°, 9°, 10° and 11° L.100 – 4).

The sectoral objectives for the development of renewable energies are specified in Article 3 of the decree of 21 April 2020 relating to the PPE[30]:

Table 1:

Installed Capacity on 12/31 (in GW)	**2023**	**2028**	
		Low Option	**High Option**
Onshore Wind Energy	24,1	33,2	34,7
Solar Enegry	20,1	35,2	44,0
Hydroelectricity (including tidal energy)	25,7	26,4	26,7
Offshore Wind Energy	2,4	5,2	6,2
Methanation	0,27	0,34	0,41

Source: Decree no. 2020–456 of 21 April 2020 on multiannual energy programming

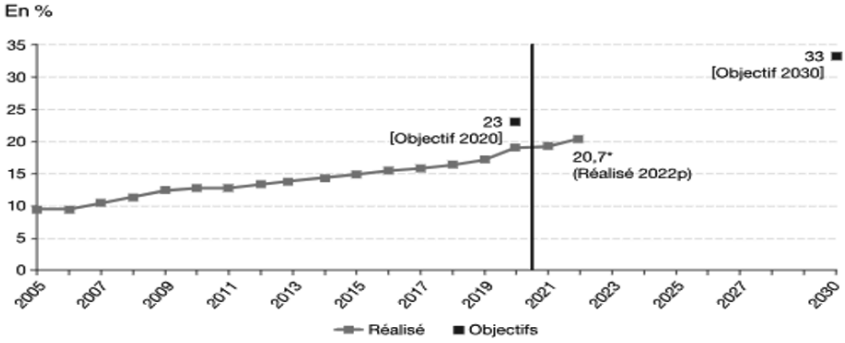
Therefore, there is a significant ambition for development from 2019 to 2028, with a doubling of renewable energy installation capacity in 2028 compared with 2017.

However, if we look at the reality of renewable energy development, France is definitely behind schedule in meeting its targets. In a report

30 Decree no. 2020–456 of 21 April 2020 on multiannual energy programming, *JORF* no. 0099 of 23 April 2020, Text no. 3.

for 2023, 20.7 % of gross final energy consumption will be accounted for by renewable energy sources, 3 % short of the target set for 2020 (23 %). We can also see that a considerable amount remains to be done achieve a target of 33 % of energy from renewable sources in gross final energy consumption by 2030.[31]

Figure 1: Renewable energies – Share of renewable energies in gross final energy consumption and 2030 target (calculated according to the Directive (EU) 2018/2001)



Source: Ministère de la transition écologique et de la cohésion des territoires, Chiffres clés de l'énergie – Édition 2023, Statistique publique, September 2023

2. Local Planning

National planning documents are then translated into local planning documents, with a multi-tiered organisation based on the following:

– The SRADDETs (L.4251 – 1 to L.4251 – 11 of the CGCT) set medium and long-term objectives for the use of renewable and recovered energy. These development objectives are compatible with the objectives mentioned for each sector in the PPE and with the regional renewable energy development objectives[32] as set out in L. 141–5–1 of the Energy Code. The regional renewable energy development targets are established by decree for mainland France after consultation with the regional councils

31 Ministère de la transition écologique et de la cohésion des territoires, *Chiffres clés de l'énergie* (Édition 2023, Statistique publique).

32 Article L. 4251–2, CGCT.

concerned. These targets are based on a common method and indicators that enable them to be monitored (L. 141–5–1, Energy Code).

- The PCAETs are specified in the French Environment Code at L.229 – 25 et seq. They are compulsory for the Lyon metropolitan area and the EPCIs à *fiscalité propre*.[33] These PCAETs define the action programme to be carried out in the EPCI or metropolitan area in order to increase the production of renewable energy and make the most of recovered energy potential, and to develop positive energy territories. This PCAET can also set targets for agrivoltaic installations (L.314 – 36 Energy Code).
- Renewable energies can also be covered by regional and urban planning documents, such as the SCOT, which can include guidelines in its orientation and objectives document that help to promote the energy transition, in particular through the development of renewable energies (Article L. 1141–10, 4°, Town Planning code). This is also the case for the regulations contained in PLUs, urban planning documents for groups of municipalities or communes, which can "delimit sectors in which the installation of renewable energy production facilities, including their connection works, is subject to conditions, provided that these installations are compatible with the inhabited neighbourhood or with the use of land located nearby, or that they are detrimental to the preservation of natural spaces and landscapes, architectural, urban and landscape quality, the enhancement of heritage and the integration of installations into the surrounding environment".[34]

In short, France aims to make its strategy coherent through a top-down approach based on setting national objectives, which are then translated into local planning documents, with a view to putting its energy policy into practice on the ground. However, obstacles to deploying this energy policy have been identified, which is why the APER law introduced a strategy based on identifying renewable energy acceleration zones (hereinafter ZAENR).

33 Article L. 229–26, Environment Code.
34 Article L. 151–42–1, Town Planning Code.

3. Renewable Energy Acceleration Zones

The Government seeks to regulate the siting of renewable energy projects on a national scale and is developing bottom-up spatial planning to this end.

The ZAENRs, set out in L. 141–5–3 of the Energy Code, are based on six principles: they must have the potential to accelerate the production of renewable energy in order to achieve the objectives of the national energy policy (set out in Article L. 100–4, Energy Code), those of the PPE and those that will be mentioned in the future programming law; they must contribute to solidarity between territories and to securing the supply, they must aim to prevent and control the dangers or inconveniences associated with their siting, they must take into account the diversification of renewable energy sources according to the territory, they must not, as a matter of principle, be included in national parks and nature reserves, nor, in the case of wind power, in special protection areas or special areas for the conservation of chiropterans in Natura 2000 areas; they must take into account the potential of areas of economic activity.

From a general point of view, the ZAENRs are based on consultation with all the players in the area and on the assumption of responsibility by the municipalities. The link between the State and the municipalities is established through a prefectural referent (*réferent prefectoral*) created for this purpose (Article L. 181–21–10). The duties of this prefectural contact are set out in Article L. 181–28–10 of the Environment Code and specified in a circular.[35] The prefectural referent is responsible for examining renewable energy development projects and industrial projects required for the energy transition. The prefectural referent is appointed by the State representative in the department, from among the sub-prefects. Without prejudice to the remit of the relevant departments, he is responsible for facilitating administrative procedures for applicants, coordinating the work of the departments responsible for examining authorisations and producing an annual report on the examination of projects in his area. They are also responsible for supporting local authorities in their energy transition planning. The circular states that "the role of the prefectural renewable energy referent is to

35 Ministère de la Transition Écologique et Solidaire/Ministère de la Cohésion des Territoires et des Relations avec les Collectivités Territoriales, *Circulaire du 28 novembre 2023 relative aux missions du référent préfectoral à l'instruction des projets d'énergies renouvelables et des projets industriels nécessaires à la transition énergétique et à la géothermie de minime importance* (ENER2331339J).

facilitate and provide support for regional renewable energy planning, particularly for local authorities, at a time when the development of renewable electrical and thermal energy production resources is essential to ensure our security of supply and combat global warming".

The ZAENRs are expected to contribute to the achievement of regional renewable energy development targets introduced by the Climate and Resilience Act, which will be formally adopted by decree.[36] This decree, which has not yet been adopted, should specify "a method and common indicators for monitoring the deployment and implementation of regional renewable energy development targets, in a way that is shared between the regions and the State, as well as between local authorities in the same region". These indicators are to be made public.

During the first phase,[37] the State and network operators will make available information "relating to the potential for the installation of renewable energy sources" to municipalities, EPCIs, energy distribution organising authorities, departments and regions. This information must be submitted within 2 months of the promulgation of the APER law, and will be updated each time the PPE is revised.

During the second phase, the municipalities have 6 months (this is not a deadline, however) to identify the acceleration zones. This identification follows a public consultation procedure, the details of which they are free to determine. The municipalities must then forward this initial zoning to the prefectural referent, to the EPCIs and, where applicable, to the SCoT.

During the third phase, the prefectural referent draws up the ZAENR map, after sending it to the regional energy committee for its opinion and organising a consultation within a territorial conference (including EPCIs and SCoT establishments).

36 Article L. 141–5–1, Energy Code: "Regional targets for the development of renewable energies are established by decree for the mainland metropolitan area, after consultation with the regional councils concerned, to contribute to the objectives mentioned in Article L. 100–4, in the law mentioned in I of Article L. 100–1 A and in the multiannual energy programming mentioned in Article L. 141–3. These objectives take into account the regional renewable and recovered energy potential that can be mobilised".

37 Article L. 141–5–3 II, Energy Code.

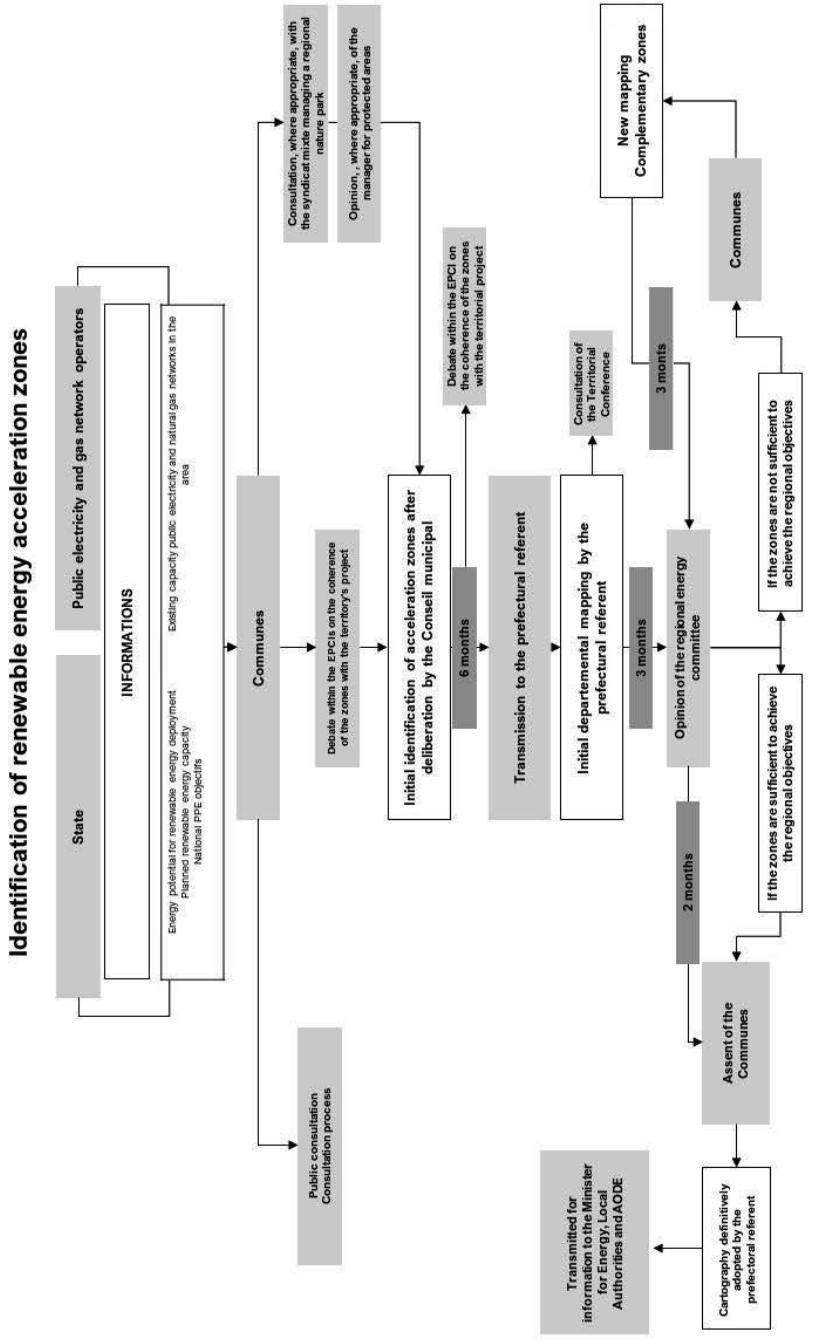


Figure 2: Identification of renewable energy acceleration zones

Source: created by Louis de Fontenelle (2024)

- If the ZAENRs are sufficient to achieve the regional objectives for the development of renewable energy – then the ZAENRs are definitively decided by the prefectural referent at the level of each department, after obtaining the assent of the communes in the department.
- If the ZAENRs are not sufficient to achieve the regional objectives for the development of renewable energy, then the municipalities will have to identify additional zones at the request of the prefectural referents. These new zones will be submitted to the regional energy committee within 3 months so that it can issue a new opinion. Then, within 2 months, the prefectural coordinator will have to draw up a department-wide map after obtaining the approval of the department's municipalities.
- The maps of these zones and the opinions are sent to the Minister for Energy and to local authorities and their groupings for information.

The identification of these ZAENRs must be renewed every five years, to coincide with the timeframe of the PPE. From 31 December 2027, they must contribute to achieving the objectives of the PPE.

In practical terms, these ZAENRs will serve a number of purposes, including simplifying administrative procedures and taking account of the location of renewable energy projects as part of the competitive procedures for obtaining public support (criteria for selecting beneficiaries).

Obviously, this zoning poses difficulties that were identified in the National Assembly's evaluation report: "The success of the scheme depends on local elected representatives taking ownership of it and on sufficient human and financial resources".[38]

E. Social acceptability

The issue of acceptability and even social appropriation is crucial. The public authorities are fully aware of this challenge. The explanatory memorandum to the APER 2023 law is very clear: "We need to move faster while creating the conditions for the acceptability and attractiveness of these projects, which are also decisive factors in their success and the development of future projects in other areas. Successfully meeting this

38 Henri Alfrandari/Eric Bothorel/Maxime Laisney/Nicolas Meizonnet, *Rapport d'information déposé en application de l'article 145–7 du Règlement par la Commission des affaires économiques sur l'application de la loi n° 2023–175 du 10 mars 2023 relative à l'accélération de la production d'énergies renouvelables* (2023).

dual challenge means removing all regulatory barriers once projects have been accepted locally by simplifying procedures and adopting a pragmatic local approach to project support. This bill aims to meet the dual challenge of local and regional acceptability on the one hand and speeding up and simplifying the process on the other. It is the cornerstone of our country's major energy transformation, which should enable France to become the first major country in the world to move away from dependence on fossil fuels while at the same time strengthening our energy independence and our exemplary climate credentials".

This question of social and territorial appropriation is based on three major issues: landscape integration, territorial sharing of value, and dispute management.

1. Landscape Integration of Renewable Energy Projects

The APER law introduces provisions relating to the proper integration of renewable energies into the landscape.[39] Article L. 141–4 of the Town Planning Code states that "the orientation and objectives document determines the conditions for implementing the strategic development project. It defines the general guidelines for organising the area, coordinating public policies and developing the area", and in particular incorporates "the preservation and development of biodiversity, natural resources, natural, agricultural and forest areas and landscapes, with the aim of integrating and enhancing the landscape quality of the various human activities, in particular renewable energy production and transmission facilities". Article L. 141–10 specifies that the guidance and objectives document defines the guidelines for " the preservation of landscapes and the integration and landscape quality of economic, agricultural, forestry and energy production and transport activities, and the natural, agricultural, forestry or urban areas to be protected, in particular because of their contribution to improving the quality of life. It specifies the way in which landscapes and their natural, historical and socio-cultural components are taken into account in development choices and ensures that the effects of visual saturation are limited. It transposes the relevant provisions of regional nature park charters to an appropriate scale".

39 Title I Measures to Promote the Use of Renewable Energies and their Integration into the Landscape (Articles 1 to 3).

In addition, with specific regard to wind turbines, the APER law introduces the "visual saturation" factor into the environmental authorisation regime for wind farm projects.[40] This means that environmental authorisation takes into account, where appropriate, the number of existing onshore wind power installations in the area concerned, in order to prevent visual saturation. The concept of "visual saturation" is not new. It was first found in administrative doctrine (concerning impact studies) and then in jurisprudence. However, this is the first time it has been incorporated into energy law[41] and has attracted criticism, particularly as it only applies to wind power (whereas large solar farms have an impact on the landscape).[42]

The question of landscape plays a central role in wind turbine litigation. From this point of view, the decision by the CE on 4 October 2023, n° 464855, Société Combray Energie, provided an interesting analysis. Before this decision, the judge "classically assessed the damage to a monumental perspective or an architectural dimension, even if it meant making an incidental reference to historical elements to support the reasoning. Adding to this traditional assessment, but going beyond the spatial criterion alone, it now sees the landscape to be protected as having a specific cultural dimension. In this way, the Conseil d'État adds an intangible criterion to a previously tangible control".[43] In this instance, it also drew on a reference to Marcel Proust, "whose work is incorporated, as it were, into the site through the memorial force of literature".[44] Thus, "the innovative character of this decision consists in relating the control of the siting of a wind farm to the protection of cultural heritage, in this case literary".[45]

2. The Concept of Territorial Value-Sharing Introduced by APER Law

With a view to promoting social ownership and raising awareness among energy consumers, the APER Act introduces a new mechanism for territorial sharing of value. The Parliament even draws a parallel with the nuclear

40 Article L. 515–44, Environment Code.
41 Blanche Lormeteau/Rémi Radiguet, 'Le volet paysage dans la loi APER: panorama d'une approche pointilliste' (2023) AJDA 1156.
42 ibid.
43 Jean-Pierre Camby/Jean-Eric Schoettl, 'L'insertion des éoliennes dans un paysage : autant en emporte la subjectivité du juge' (2023) RFDA 1073.
44 ibid.
45 ibid.

industry: "In the same way that the nuclear fleet has enabled the French to benefit from electricity prices that reflect its competitiveness, we can, with renewable technologies, enable our territories and their inhabitants to benefit from their competitiveness".[46] The law thus introduces a mechanism for sharing the value of low-carbon energies, which is seen as "one of the keys to buy-in and ownership lies in demonstrating a concrete and direct benefit for local residents".[47]

The APER Act of 2023 devotes a chapter to measures promoting the territorial sharing of the value of renewable energies, with a view to improving the social acceptability of energy projects. However, an in-depth analysis of these mechanisms suggests that there will be difficulties in implementing them.[48] Similarly, decrees clarifying the legal provisions are still awaiting publication.[49]

The first mechanism, contained in Article L. 294–1 of the Energy Code, establishes an obligation for the members or shareholders of a REN production company to inform the mayor of the municipality or president of the EPCI where the REN project is located, so that they can make an offer to participate in the capital of this company (information no later than two months before the articles of association are signed). Similarly, in the event of the sale of all or part of the capital, the company must inform the mayor or president of the EPCI no later than 2 months before the sale so that they can make a purchase offer (if the municipality or EPCI remains silent, this will be deemed to be a refusal on expiry of the deadline). In principle, this mechanism should apply to all renewable energy sources. There are no penalties for failure to meet this obligation.

The second territorial value-sharing mechanism for financing the energy transition and biodiversity is based on the creation of a "territorial value-sharing contribution" for renewable energy electricity generation projects (Article L. 314–41 of the Energy Code) and biogas projects (Article L. 446–59, Energy Code). This scheme only concerns project developers who receive economic support (winners of the competitive tendering procedure

46 Explanatory memorandum on the APER law.
47 Explanatory memorandum on the APER law.
48 Louis de Fontenelle, 'Territorial value-sharing of renewable energies. Critical analysis of the French mechanism introduced by the 2023 Renewable Energy Acceleration Act', in Sébastien Bourdin (dir.), The Social Acceptability of Renewable Energy Projects, éd. Edward Elgar Publishing, (to be published 2025).
49 Chapter II: Measures to promote territorial sharing of the value of renewable energies (Articles 93 to 97).

under Article L. 311–10 of the Energy Code or of the call for projects under the experimental contract). These project sponsors are obliged to finance either energy transition projects (energy renovation, energy efficiency, mobility, combating fuel poverty) or projects to protect or safeguard biodiversity, supported by the municipality or EPCI. These contributions can be made either directly to a project, or by payment into a fund. The amount of the contributions is determined according to the installed capacity of the electricity generating facility, and may not be less than a threshold set by decree. There is a possibility that this contribution will take the form of an equity stake for energy transition projects. Biodiversity protection projects may be financed by payments to the French Biodiversity Agency, provided they are part of national operational action plans for the conservation or recovery of endangered species. The contribution is paid prior to the activation of the feed-in tariff and remuneration supplement contracts, with a reporting obligation for municipalities and EPCIs (annual report on the amount of the territorial contribution and its use).

The third provision is set out in Article 95 of the APER law. As part of the competitive tendering procedure, it may be specified that renewable energy production companies are required to offer a share of the capital to residents living near the project site or to the municipality or grouping of which it is a member, on whose territory the project is to be located, and to make their shares available to them, where appropriate. This provision is in line with the public authorities' desire to extend participatory investment to all renewable energy production projects.

The fourth and final provision is set out in Article 96 of the APER law. It provides for an exemption from payment of the occupancy fee by the REN production SA (*société anonyme*) or SAS (*société par actions simplifiées*) "if the proceeds of the fee thus collected are used to finance the acquisition of holdings in its capital".

3. Litigation

Renewable energy projects in France are the subject of litigation, sometimes systematically (in the case of developing renewable energy). The legislature has introduced measures to streamline litigation procedures. Litigation is a factor in slowing down the deployment of renewable energy projects. According to the impact study for the APER law: "Today, it is estimated that more than 75 % of authorisations issued for onshore wind farms are

subject to appeal, and this figure rises to 100 % for offshore wind farms. Around 7 % of these appeals result in the authorisation being cancelled altogether".

The strategy to contain litigation is based on:

- The creation of a specialised institution to rationalise and simplify offshore wind energy litigation. The example of offshore wind power is topical. Before the 2020 law on the acceleration and simplification of public action,[50] offshore wind power litigation was assigned in the first and last instance to the Nantes Administrative Court of Appeal.[51] Since 2020, this litigation has been assigned to the Conseil d'Etat. The regulations list the decisions that may be appealed to the Conseil d'Etat at first and last instance.[52]
- The creation of a guarantee fund to compensate for part of the financial losses resulting from the annulment by an administrative judge of a decision authorising the deployment of renewable energy projects (lists of decisions specified in Article 24 of the APER law).
- Powers of regularisation attributed to the administrative judge.[53]

F. Support, Business Models and Contracts

The State has a multi-faceted strategy for supporting various types of projects (of varying sizes), carried out by different types of players. To achieve this, it has set up a number of mechanisms.

1. Feed-in Tariffs and Feed-in Premium

Under French law, there are two main support mechanisms that enable producers to make a profit from the energy they have produced, while obtaining a minimum guarantee to ensure a return in relation to the investment costs of renewable energy installations: the *tarif d'achat* (feed-in tariff) and the *complément de rémunération* (feed-in premium).

50 Law no. 2020–1525 of 7 December 2020 on accelerating and simplifying public action, JORF no. 0296 of 8 December 2020, Text no. 1.

51 François-Xavier Bréchot, 'Compétence nantaise en matière d'éolien en mer: autant en emporte le vent?' (2022) 1 AJDA 32.

52 Art. R. 311–1–1 CJA.

53 Article 60 of the APER law.

Despite the common rules, which relate in particular to the procedure for concluding these contracts and certain terms and conditions relating to their performance, they retain certain specific features that are unique to them.[54] The legal regime for the *tarif d'achat* is defined in Articles L. 314–1 to L. 314–13 of the Energy Code. The legal status of the *complément de rémunération* is defined in Articles L. 314–18 to L. 314–27 of the Energy Code.

The *tarif d'achat* seeks to ensure that the producer can sell all the energy produced. The *complément de rémuneration* aims to involve the producer directly in the market, while offering him economic support in the face of market fluctuations. These two support schemes have their own scope of application. The renewable energy installations eligible for each of the contracts differ according to certain technical and economic characteristics, in line with the degree of maturity of the renewable energy sector. The scope of these contracts varies, which explains why certain renewable energy sectors that have reached a sufficient degree of maturity and structuring are no longer eligible for the *tarif d'achat* contract, but only for the *complément de rémunération* contract (as in the case of "installations using mechanical wind energy located on land that do not have any wind turbine generator with a rated output of more than 3 MW and a maximum of six wind turbine generators").[55]

2. Long-Term Sales Contracts

Article 86 of law no. 2023–175 of 10 March 2023 on accelerating the production of renewable energy is dedicated to contracts for the direct sale of electricity and biogas, renewable gas and low-carbon gas ("contrats de vente directe d'électricité" and "contrat de vente directe à long terme de biogaz, de gaz renouvelable ou de gaz bas-carbone de gaz"). These contracts are better known as "*power purchase agreements*" (PPAs), over-the-counter contracts

54 Louis De Fontenelle/Stephane Andrieu, 'La valorisation de l'électricité produite par de l'énergie photovoltaique: analyse juridique des modèles de vente et d'autoconsommation' in David Bailleul/Helene Claret (eds), *Le développement de l'énergie photovoltaique* (Presses universitaires Savoie Mont Blanc 2023).

55 Order of December 29, 2022 amending the order of May 6, 2017 establishing the conditions for additional remuneration for electricity produced by electricity generation facilities using mechanical energy from wind, with a maximum of six wind turbines, JORF No. 0303 of December 31, 2022, Text No. 120.

for the sale of energy by a producer to an end consumer.[56] It is a model that breaks with the existing and traditional models of energy production and consumption, in other words a "new form of energy marketing".[57] The aim of the law is to develop the use of PPAs. In France, the use of PPAs is less widespread than in other EU countries.[58] "There are several reasons for this situation: the absence of a dedicated regulatory framework; the scale of public support (via feed-in tariffs or remuneration supplements), which was not compatible with the sale of guarantees of origin; the already highly decarbonised composition of the electricity mix due to nuclear power; and the cost of nuclear power".[59] In concrete terms, French law legally enshrines a certain model of PPA contracts: "For the purposes of Article L. 333–1(I) (2), the term 'direct electricity sales contract' means any contract for the sale of electricity by a producer connected to the mainland electricity grid to an end consumer for final consumption or to a network operator for its losses, without subsequent transfer" (Article R. 333–1, Energy Code[60]). It also opens up the possibility of mixed offers combining public support and direct sales as part of competitive tendering procedures. It now clearly states that contracting authorities and entities may enter into long-term direct sales contracts for electricity produced solely from renewable sources (Article L. 331–5 of the Energy Code), as well as long-term direct sales contracts for biogas, renewable gas or low-carbon gas (Article L. 441–6 of the Energy Code).

56 On these contracts, see in particular. Louis-Narata Harada/Marie Coussi, 'Les "Power Purchase Agreements" en France, un outil émergent au cœur de la transition énergétique' (2020) 87 BDEI 20; Mathias Dantin/Adil Kourtih, 'Corporate Power Purchase Agreements. Premiers retours d'expérience sur les points clefs de négociation' (2023) Cah. dr. entr dossier 14; Cecil Fontaine/Flavien Loustau, 'La commande publique à l'épreuve des nouvelles formes de commercialisation de l'énergie' (2023) 4 Contrats et Marchés publics study 2.

57 Louis de Fontenelle/Marie Lamoureux, 'Les contrats de vente directe d'électricité et de gaz' (2023) AJDA 1173.

58 E-CUBE, 'Analyse des dynamiques et des mécanismes publics de soutien aux énergies renouvelables favorables aux PPA en Europe' (10 February 2022) <www.cre.fr> accessed 27 August 2024.

59 De Fontenelle/Lamoureux (n 57) 1173.

60 Introduced by Decree No. 2024–613 of June 27, 2024 on the authorization to supply electricity and the reduction of the tariff for the use of public electricity networks, JORF n°0151 of June 28, 2024, Text No. 7.

3. Self-consumption and energy communities

The Clean Energy Package introduced the concept of self-consumption and energy communities. These concepts have been translated into French law. There are now several legal regimes:

- Individual and collective self-consumption as referred to in Articles L.315 – 1 to L.315 – 8 of the Energy Code
- Citizen energy communities and renewable energy communities as referred to in Articles L.291 – 1 to L.294 – 1 of the Energy Code. Recently, Decree 2023–287 of 26 December 2023 created the regulations applicable to energy communities.[61] It clarifies the distinction between renewable energy communities and citizen energy communities, and sets out the criteria for autonomy and geographical proximity, the procedures for withdrawing from these communities, and the conditions for compensating network operators.

These concepts aim to develop renewable energies through the direct involvement of citizens, local authorities and small and medium-sized enterprises in the local production and consumption of energy as part of local circuits.[62]

G. Administrative Simplification

The timeframe for developing renewable energy projects is conditioned by the procedural and formal stages to which they are subject. This is one of the main constraints for project developers.

The Government's instruction of 16 September 2022 on the organisation of the distribution and load shedding of natural gas and electricity consumption in the run-up to the winter of 2022–2023 and the acceleration of the development of renewable energy projects explained that "an unprecedented acceleration in the deployment of renewable energies (wind, photovoltaic, renewable gas, etc.) is essential if we are to meet our targets for reducing greenhouse gas emissions, break our dependence on imported

61 Decree no. 2023–1287 of 26 December 2023 on energy communities, JORF no. 0300 of 28 December 2023, Text no. 96.

62 François-Mathieu Poupeau/Blanche Lormeteau, *L'autoconsommation collective d'électricité en France: Émergence d'une innovation contrariée* (Presses des Mines 2024).

fossil fuels and ensure our security of supply, which is currently under threat in the short term. It is therefore up to the departmental prefects, who are responsible for enforcing the law, to ensure that the renewable energy development targets set out in the multiannual energy programme (PPE) are fully implemented. France can no longer be the only country in the European Union to fail to meet its binding national target for the development of renewable energies".[63] The aim of this original instruction is to facilitate and speed up the processing of applications for current and future renewable energy projects, and to ensure that no application will take longer than 24 months, except in very exceptional circumstances.

The procedures for authorising renewable energy projects are based on a succession of complex procedural stages[64] at the intersection of various provisions (urban planning law, environmental law, energy law). This means that it takes a long time to obtain permits and authorisations – "It takes an average of 5 years of procedures to build a solar farm requiring a few months of work, 7 years for a wind farm and 10 years for an offshore wind farm" (according to the explanatory memorandum to the APER law). The urban planning and environmental constraints are based on the idea of reconciling the interests likely to be affected by the project with the interests of the project itself. These constraints vary greatly depending on the nature of the project. There are specific rules depending on the sector concerned, and the characteristics and location of the project. For example, onshore wind power is subject to the ICPE and environmental authorisation regime (the aim of environmental authorisation is to bring together in a single authorisation several authorisations that a project developer must obtain), whereas photovoltaic power is essentially subject to town planning and energy law.

There is a desire to simplify and streamline the administrative authorisation process:

– The first manifestation is the presumption of major public interest in obtaining a "protected species" exemption (Article L.211 – 2–1 of the Energy Code).

63 Ministère de la transition énergétique, *Instruction du Gouvernement du 16 septembre 2022 relative à l'organisation de la répartition et du délestage de la consommation de gaz naturel et de l'électricité dans la perspective du passage de l'hiver 2022–2023 et à l'accélération du développement des projets d'énergie renouvelable* (ENER2226074C).

64 Pierre Delvolvé, 'Mesures structurelles – Les investissements – Les installations de production d'énergies renouvelables' (2023) RFDA 42.

- From a procedural point of view, the APER law also provides for a reduction in certain appraisal deadlines, 3 months in ZAENR, 4 on justification, (Article L. 123- 15 of the Environment Code), 15 days to deliver the public enquiry report, compared with 30 days today (Article L.223- 15 of the Environment Code (new version)).
- The APER law introduces rules to simplify repowering.
- In addition, Article L. 121–12–1 has been added to the Town Planning Code, stipulating that, as an exception to the principle of limiting the expansion of urban development (Article L. 121–8), photovoltaic and thermal production units may be set up, in exceptional circumstances, on brownfield sites "particularly industrial sites" listed by decree, after consultation with the Conservatoire de l'espace littoral et des rivages lacustres.

H. Conclusion: The Complexity of the Law and the Risk of a Deterioration in the Quality of Standards

Some authors have raised the issue of the deterioration in the quality of the standard,[65] both as regards the drafting of the standard and the content of the standard itself.[66] Today, the French Government is keen to control and steer the development of renewable energies in France, and to this end is putting in place a complex system of standards aimed at liberating

65 Philippe Terneyre, 'L'accélération de la dégradation de la norme législative' (2023) AJDA 1145.

66 The Conseil d'Etat has itself been critical of the impact study that preceded the APER law (CE, 15 and 22 September 2022, opinion on a draft law on the acceleration of renewable energies): "3. The impact study of the draft appears to be uneven, inadequate in several Articles, and even non-existent in certain important provisions. The shortcomings noted are due, firstly, to the absence of an inventory of the current situation, of precise data concerning the situations to which the measures relate, which, in some cases, corresponds to oversights that can be remedied, but, in other cases, seems to lend credence to the idea that the proposed changes to the texts are based on presuppositions rather than substantiated observations: this is the case, in particular, with the idea that litigation is a determining factor in the delays noted in the implementation of a project. Secondly, the impact study lacks justification for certain important choices, as well as legal analyses, even summary analyses, of the delicate points of the proposed provisions. Nor does it put into perspective the margins for progress that exist under constant law for speeding up projects. Finally, European Union law and international law have not always been sufficiently taken into account. The impact study should be completed on the various points mentioned above before the bill is submitted to Parliament".

renewable energies while at the same time protecting certain interests. The arsenal of planning and regulations makes this law very difficult to understand. It opens up possibilities for litigation, since the risk of litigation is increased by incorporating new concepts and notions. This overabundance of standards could have the opposite effect to that intended.

Bibliography

Alfrandari H/Bothorel E/Laisney M/Meizonnet N, *Rapport d'information déposé en application de l'article 145–7 du Règlement par la Commission des affaires économiques sur l'application de la loi n° 2023–175 du 10 mars 2023 relative à l'accélération de la production d'énergies renouvelables* (2023)

Boillet N/Guéguen-Hallouët G, 'Principaux apports de la loi APER pour le déploiement des éoliennes en mer' (2023) AJDA 1179

Bréchot F X, 'Compétence nantaise en matière d'éolien en mer: autant en emporte le vent?' (2022) 1 AJDA 32

Camby J P/Schoettl J E, 'L'insertion des éoliennes dans un paysage : autant en emporte la subjectivité du juge' (2023) RFDA 1073

Cour des Comptes, *Les soutiens à l'éolien terrestre et maritime. Exercices 2017 et suivants* (March 2023)

Delvolvé P, 'Mesures structurelles – Les investissements – Les installations de production d'énergies renouvelables' (2023) RFDA 42

De Sartre X A/Missaghieh-Poncet J/Desvallées L, 'En France, l'acceptabilité sociale des technologies de décarbonation de l'énergie à l'ombre de la dépendance au nucléaire' (2022) 4 EEI

Dezobry G, 'Mesures structurelles – Les investissements – La relance du nucléaire' (2023) 1 RFDA 34

Emmanuel Macron, 'Reprende en main notre destin énergétique!' (Élysée 10 February 2022) <https://www.gouvernement.fr/upload/media/default/0001/01/2022_02_nucleaire_belfort.pdf> accessed 27 August 2024

Dantin M/Kourtih A, 'Corporate Power Purchase Agreements. Premiers retours d'expérience sur les points clefs de négociation' (2023) Cah. dr. entr dossier 14

De Fontenelle L/Andrieu S, 'La valorisation de l'électricité produite par de l'énergie photovoltaique: analyse juridique des modèles de vente et d'autoconsommation' in **Bailleul D/Claret H** (eds), *Le développement de l'énergie photovoltaique* (Presses universitaires Savoie Mont Blanc 2023)

De Fontenelle L/Lamoureux M, 'Les contrats de vente directe d'électricité et de gaz' (2023) AJDA 1173

E-CUBE, 'Analyse des dynamiques et des mécanismes publics de soutien aux énergies renouvelables favorables aux PPA en Europe' (10 February 2022) <www.cre.fr> accessed 27 August 2024

Fontaine C/Loustau F, 'La commande publique à l'épreuve des nouvelles formes de commercialisation de l'énergie' (2023) 4 Contrats et Marchés publics study 2

Grimonprez B, 'L'agrivoltaisme à la lumière du droit' (2023) AJDA 1168

Harada L N/Coussi M, 'Les "Power Purchase Agreements" en France, un outil émergent au cœur de la transition énergétique' (2020) 87 BDEI 20

Lamoureux M, Droit de l'énergie (ed. LGDJ, 2nd edition, 2022) 462

Le Bihan-Graf C/Jérémie P, 'Les principales mesures de la loi relative à l'accélération de la production d'énergies renouvelables' (2023) 5 EEI study 11

Lormeteau B/Radiguet R, 'Le volet paysage dans la loi APER: panorama d'une approche pointilliste' (2023) AJDA 1156

Martin V, 'Agrivoltaïsme : entre incitation et régulation – Regards croisés sur un droit en construction. – Note à partir des travaux du colloque au Palais du Luxembourg du 7 avril 2023' (2023) 11 EEI study 25

Ministère de la transition écologique et de la cohésion des territoires, *Chiffres clés de l'énergie* (Édition 2023, Statistique publique)

Ministère de la transition énergétique, *Instruction du Gouvernement du 16 septembre 2022 relative à l'organisation de la répartition et du délestage de la consommation de gaz naturel et de l'électricité dans la perspective du passage de l'hiver 2022–2023 et à l'accélération du développement des projets d'énergie renouvelable* (ENER2226074C)

Ministère de la Transition Écologique et Solidaire/Ministère de la Cohésion des Territoires et des Relations avec les Collectivités Territoriales, *Circulaire du 28 novembre 2023 relative aux missions du référent préfectoral à l'instruction des projets d'énergies renouvelables et des projets industriels nécessaires à la transition énergétique et à la géothermie de minime importance* (ENER2331339J)

Poupeau F M/Lormeteau B, *L'autoconsommation collective d'électricité en France: Émergence d'une innovation contrariée* (Presses des Mines 2024)

Terneyre P, 'L'accélération de la dégradation de la norme législative' (2023) AJDA 1145