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ING
PAPER
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*ENERGY FOR A JUST AND GREEN
RECOVERY DEAL: THE ROLE OF THE
INDUSTRIAL RELATIONS IN THE
ENERGY SECTOR FOR A RESILIENT
EUROPE*

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**REJENERAXION:
French Baseline Report
Christophe TEISSIER**

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REJENERAXION French Baseline Report

Abstract

The green transition of the energy sector is a hot topic in France. This has led to the design of strategies and policy initiatives for several years. Globally, the objective is to support the production and consumption of fossil-free energies. The French energy system is characterised primarily by a largely decarbonised energy production on the territory. However, primary energy consumption remains dominated by fossil fuels. In the context of the green transition, France has chosen to opt for a carbon-neutral and sovereign system.

This baseline report aims to shed light, based on a desk research, on the French situation regarding the green transition of the energy sector. The aim of this overview is to grasp the impacts of the transition on employment and work and the role social dialogue and its actors play to support this transformation.

As a result, the first part of the report takes stock of the national political framework supporting the transition. The second part tries to address the main trends of evolution related to the energy transition (economic, environmental and employment trends). We then highlight main drivers and barriers to the transition identified at different levels. The last part of the report relates to the role of social dialogue and its actors in support of a socially just transition.

A short survey focused on some of the main actors of the energy transition in France, especially social partners, complemented the desk research. The results of the survey are to be found in annex of our report.

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List of abbreviations

ADEME : Agence de l'environnement et de la maîtrise de l'énergie

CARSAT : Caisse d'assurance retraite et de santé au travail

CBE : Comité de Bassin d'Emploi

CFDT : Confédération Française Démocratique du Travail

CFE CGC : Confédération Française de l'Encadrement – Confédération Générale des Cadres

CGT : Confédération Générale du Travail

CGT FO : Confédération Générale du Travail – Force Ouvrière

CNI : Conseil National de l'industrie

CPRI : Commission Paritaire Régionale Interprofessionnelle

EDEC : Engagement de Développement de l'Emploi et des Compétences

FEDENE : Fédération des Services Energie Environnement

FNME CGT : Fédération des Mines et de l'Energie – Confédération Générale du Travail

GPEC : Gestion Prévisionnelle des Emplois et des Compétences

IEG : Industries Electriques et Gazières

INRS : Institut National de Recherche et de Sécurité

MEDEF : Mouvement des Entreprises de France

PCAET : Plan Climat-Air-Energie Territorial

PIA : Programme d'investissements d'avenir

RE&R : Renewable and Recovered Energies

RTE : Réseau Transport D'Electricité

SNBC : Stratégie Nationale Bas Carbone

SRADDET : Schémas régionaux d'aménagement, de développement durable et d'égalité des territoires

SRCAE : Schéma Régional du Climat, de l'Air et de l'Energie

UFE : Union Française de l'Electricité

THE ENERGY SECTOR IN FRANCE¹

1. THE ENERGY SECTOR IN FRANCE: OVERVIEW

The energy sector in France clearly faces the challenge of the green transition. This is a hot topic in the country and this has led to the design of strategies and policy initiatives for several years. Globally, the objective is to support the production and consumption of fossil-free energies. The French energy system is characterised primarily by a largely decarbonised energy production on the territory. However, primary energy consumption remains dominated by fossil fuels. In the context of the green transition, France has chosen a carbon-neutral and sovereign system. The first step is therefore to promote a supply of decarbonised energy produced in France, favouring the production of electricity both through the maintain and renewal of the nuclear industry and the development of renewable energies produced on the national territory. At the same time, this orientation should lead to the progressive abandonment of the production and consumption of fossil-fuel energies. This has both a positive and negative impacts on employment and jobs. On one hand, it supposes to create new jobs to foster the increase in the production of decarbonised energies. On the other hand, it puts at risk some significant industries using, producing and distributing fossil energies, especially oil, gas and coal. In addition, shifting to carbon –free energies also affects economy and employment at territorial level. All of this highlights the need for the development of a social and environmental dialogue at different levels to anticipate and mitigate the negative impacts of restructuring, i.e. a just transition.

2. NATIONAL POLITICAL FRAMEWORK FOR ENERGY TRANSITION

2.1. Overview of relevant policy and legal framework

The French strategy of energy transition towards decarbonised energy sources is rooted in the international awareness of the challenges linked to the fight against climate change (first Earth Summit in Rio in 1992, Kyoto Protocol, which came into force in 2005, successive IPCC

¹ This paper is part of the project “REJenerAXion - Energy for a just and green recovery deal: the role of the industrial relations in the energy sector for a resilient Europe”, a European Union co-funded research project (101052341/SOCPL-2021-IND-REL) aimed at analyzing and strengthening the role of innovative industrial relations structures, including social dialogue, to respond in a socially fair and balanced way to the main challenges and opportunities offered by a clean-energy transition at national and European level.

The project partners are: Fondazione Di Vittorio (Italy, project coordinator); Federazione Italiana Lavoratori Chimica Tessile Energia Manifatturo – FILCTEM CGIL (Italy); Fundacion 1º de Mayo (Spain); Association travail emploi Europe société-ASTREES (France); wmp consult – Wilke Maack (Germany); Laboratoire d’Etudes sur les Nouvelles formes de Travail, l’Innovation et le Changement, LENTIC, Université de Liège (Belgium); Instytut Spraw Publicznych (Poland); Central European Labour Studies Institute CELSI (Slovakia (and Hungary). Supporters are: European Federation of Public Service Unions- EPSU (EU); European Trade Union Institute – ETUI (EU). Website: <https://www.rejeneraxion.com/>.

The aim of the paper is to provide the main results of research reports at a national level based on desk analysis and qualitative research (in-depth interviews with stakeholders) considering the transformations taking place in the energy sector oriented towards clean energy and their impacts on the world of work and the role of industrial relations and social dialogue for a just transition.

reports, etc.). In this context, France has been initiating policies to reduce greenhouse gas emissions since 2000. This included different instruments adopted from 2000 to 2015 : [A national programme to combat climate change \(2000\)](#);[-A Climate Plan 2004 - 2012](#)², the [Law 2005-781 on the programming and orientation of energy policy of 13 July 2005](#)³.

However, it was in 2015 that a new regulation was adopted, laying the foundations for the strategies currently deployed. Proposed in 2014 by the government, the law on the energy transition for green growth follows on from earlier debates, in particular the Grenelle Environment Forum (2007)⁴ and the [national and citizen debate on the energy transition](#) organised by the National Commission for Public Debate (2012-2013). This [law n° 2015-992](#) of 17 August 2015 sets the main objectives of a new French energy model in the framework of France's global and European commitments.

It defines (in article L. 100-4 of the Energy Code) the objectives of the national energy policy, notably:

- Reduction of greenhouse gas emissions by 40% between 1990 and 2030 and division by four of emissions between 1990 (552 Mt CO₂e) and 2050.
- Reduction of final energy consumption by 50% in 2050 compared to 2012
- Reduction of primary energy consumption of fossil fuels by 30% in 2030 compared to 2012.
- Increase the share of renewable energy to 23% of gross final energy consumption in 2020 and 32% in 2030; by this date, to achieve this target, renewable energy must account for 40% of electricity production, 38% of final heat consumption, 15% of final fuel consumption and 10% of total energy consumption.

- Reduction of the share of nuclear power in electricity production to 50% by 2025

In addition, the law set up two tools for programming the energy transition:

- ***Multiannual energy plans***: these documents express the guidelines and priorities for action of the public authorities for the management of all forms of energy on the territory, in order to achieve the objectives of the energy policy. Articles L. 141-1 to L. 141-4 of the Energy Code governs them. Each multiannual programme covers two successive 5-year periods. The first was adopted in 2016 for the period 2016-2023. Following a revision initiated in 2017, the second programme was adopted in April 2020 to cover the period 2019-2028. These documents address all energies and all the pillars of the French strategy: controlling energy demand, controlling energy costs, promoting renewable energies, guaranteeing security of supply and energy independence.

- ***The National Low Carbon Strategy***: The National Low Carbon Strategy (SNBC) describes France's roadmap for conducting climate change mitigation policy. It provides guidelines for implementing the transition to a low-carbon economy in all sectors of activity. It defines short- and medium-term greenhouse gas emission reduction targets through carbon

² this aimed to reduce French emissions by 10% by 2010 and to reduce them by a factor of 4 from 1990 to 2050

³ This law already aimed to promote energy savings and the development of renewable energies without abandoning nuclear energy

⁴ The Grenelle de l'Environnement was a series of political meetings held in France in September and December 2007, aimed at taking long-term decisions on the environment and sustainable development and bringing together various stakeholders (State, local authorities, NGOs, employers and unions)

budgets. Carbon budgets are emission ceilings that must not be exceeded in five-year periods. They are defined for each sector of activity and in relation to the various greenhouse gases. The multi-annual energy programming must be compatible with the objectives set by the carbon budgets. Overall, the strategy has two general objectives: to achieve carbon neutrality, i.e. zero net emissions by 2050 (from 2019, thus exceeding the initial objectives set by the 2015 law) and to reduce the carbon footprint of the French. First adopted in 2015, the SNBC was revised in 2018-2019, with the aim of achieving carbon neutrality by 2050. This new version of the Strategy and the 2019-2023, 2024-2028 and 2028-2033 carbon budgets were adopted in April 2020 by [decree](#).

The revision of these two documents from 2017 onwards is because greenhouse gas emissions exceeded the limits set by the carbon budgets over the first period 2015-2018⁵. These deviations can be explained over this period by the low price of energy, which encouraged greater consumption, but also by the partial unavailability of nuclear power in 2016 and 2017 and by significantly lower than expected emissions in the transport and building sectors. The second low-carbon strategy has therefore raised the emission caps for the period 2019-2023, while expecting a return to the initial trajectory for the period 2024-2028. This illustrates the need for a strategy that is sufficiently flexible to take into account real developments. In any case, these two documents serve as a basis for the development of the National Integrated Energy and Climate Plan (PNIEC)⁶ that France must produce at European level.

In 2019, a new law amended and enriched the existing strategy: the [law n° 2019- 1147 of 8 November 2019 on energy and climate](#). This law updated the energy policy objectives set out in the Energy Code and initially defined by the 2015 law. In particular, it set a target of a 40% reduction in fossil fuel consumption - compared to 2012 - by 2030 (compared to 30% in 2015). It also confirmed the end of coal-fired power generation by 2022 and introduced a cap on greenhouse gas emissions from existing fossil fuel power plants. The law postponed the reduction of nuclear power generation to 50% by 2035 (instead of 2025 in 2015). It established a mandatory installation of solar panels or any other renewable energy production process or vegetation for new warehouses and commercial buildings (1,000 square metres of floor space). The law also encouraged the low-carbon and renewable hydrogen sector with the prospect of reaching between 20 and 40% of total industrial hydrogen consumption by 2030. Regarding the governance of the French strategy, the law establishes a High Council for the Climate, a consultative body in charge of evaluating the strategy and the policies to implement it. Finally, **it provides for the adoption in 2023 of a five-year programming law setting the major energy objectives:**

- Renewable energy;
- Energy consumption
- Exit from fossil fuels;

⁵ For a broader and critical assessment of this strategy, see G. Duval and M. Charru, Climat- Energie : la France doit se donner les moyens, Opinion on the National Low Carbon strategy and Multiannual energy plan, Economic, social and environmental Council (CESE), April 2019

⁶ The last integrated plan produced by France dates from [March 2020](#)

- Minimum and maximum levels of obligation for energy saving certificates.

This law will be drawn up in close collaboration with the High Council for the Climate. It will lead to a new revision of the low-carbon strategy and the multi-year energy plan (for the period 2024-2033).

Prior to the adoption of this new law, however, recent initiatives should be noted:

- The adoption of a very recent [law n° 2023-175 of 10 March 2023](#) on the acceleration of renewable energy production. This text aims to accelerate the production of renewable energies, particularly wind power, photovoltaic. It thus aims to make up for France's delay in achieving its strategic objectives for renewable energies.

- In February 2022, the President of the Republic announced, contrary to previous objectives, a plan to revive the nuclear industry. The aim is to achieve carbon neutrality by 2050 while meeting the increased need for electricity in a sovereign manner. This revival covers both the extension of the lifespan of existing nuclear reactors in France and the construction of new modular, second-generation reactors, initially six in number and eventually eight more. Following this announcement, the Government submitted a bill on the acceleration of nuclear power to the Parliament. This bill is still under discussion in Parliament. Its adoption would result in particular in the modification of Article L.100-4 of the Energy Code by removing the objective of reducing the share of nuclear power in French electricity production to 50% by 2050.

2.2. Institutional initiatives to support a just energy transition

In the context of the very many initiatives taken to support a fair energy transition, we have selected various sources to illustrate the efforts made in France.

- *The State's Green budget*

Since Law No. 2019-1479 of 28 December 2019 on the finances for 2020, the Government has submitted a report on the "environmental impact of the budget" to Parliament each year, as an annex to the Finance Bill (PLF). The last report produced under this heading was therefore published in October 2022 as an annex to the 2023 draft budget. The first part of this document is devoted to the environmental budgeting of the State, commonly referred to as the 'green budget'. It presents the environmental impact of the budgetary appropriations and tax expenditures included in the 2023 Finance Bill (PLF). On this basis, government expenditure is divided into three categories: environmentally friendly expenditure, mixed expenditure (partly friendly and partly unfriendly), neutral expenditure and unfriendly expenditure. Overall, in 2023, favourable and mixed expenditure, i.e. expenditure favourable to the environment on at least one axis, will reach €39.8bn in 2023 and €36.2bn excluding the recovery plan. Within this very large total, we can find expenditure relating to various budget programmes that are relevant to our project. This is the case of programme 174 "*energy, climate and post-mining*". On the one hand, this programme is made up of aid paid to households to assist them in the energy transition: the energy cheque; the "*MaPrimeRenov*" energy transition bonus; aid for the acquisition of clean vehicles. On the other hand, it covers in particular post-mining support, focusing on the management of social guarantees and the economic conversion of mining areas; activities to promote the fight against the greenhouse effect and climate change and to improve air quality.

Overall, spending on these different objectives will amount to approximately 5 billion euros in 2023.

- The Future Investment Programme 4

The “Programme d'Investissements d'Avenir (PIA)” was set up by the State to finance innovative and promising investments on the territory, in order to enable France to increase its growth and employment potential. It started in 2010 and is now known as PIA 4. Launched in 2021, it has a budget of €20 billion over five years. PIA 4 has set itself a target of at least one third of investments in favour of the ecological transition. In this sense, a large part of the new priority innovation strategies of the PIA 4 will be dedicated to the ecological transition on a broad range of areas. This especially includes the national strategy for the development of decarbonised hydrogen announced by the Government in September 2020.

- The France Recovery Plan

Launched in 2020, this €100 billion investment plan should accelerate the ecological transition of the economy, strengthen our competitiveness and bring about an industrial recovery, while supporting employment and skills, particularly for young people, and the development of all regions. It is thus structured along three axes (ecology, competitiveness and cohesion). The ecological transition is one of the components of this plan and has been allocated a budget of 30 billion euros. The plan has several objectives: to accelerate the energy transition, to promote sustainable growth and to make France the first major low-carbon economy in Europe. Nearly 9 billion euros are allocated to the decarbonisation of industry and energy, as well as to research and development in the field of green technologies. Seven billion euros are also earmarked for the energy renovation of buildings. A [scoreboard](#) for monitoring the implementation of the various measures in this plan is available online.

- Partnership agreement between the European Commission and France 2021-2027 under the EU cohesion policy

Adopted in June 2022, this agreement sets out France's strategy for investing €18.4 billion in EU cohesion policy funding for the period 2021-2027. The funds will help France to promote economic, social and territorial cohesion, while supporting key EU priorities such as the ecological and digital transition. On this basis, it is notably foreseen that the Just Transition Fund, with a budget of around €1 billion, will help ten French territories in six regions (Hauts-de-France, Grand-Est, Normandie, Auvergne-Rhône-Alpes, Pays-de-la-Loire and Provence-Alpes-Côte d'Azur) to cope with the impacts of the energy transition and to diversify their economic activities currently based on carbon-intensive industries. This will include support of around €200 million for skills development and professional transitions to help the workers and jobseekers concerned seize new employment opportunities.

2.3. The geopolitical implications on energy transition

Through its strategic orientations, in particular the low-carbon strategy 2020, France has chosen a carbon-neutral and sovereign system. The first step is therefore to promote a supply of decarbonised energy produced in France, including electricity and biomass produced on the national territory. In this perspective, it should be noted that the development of the nuclear

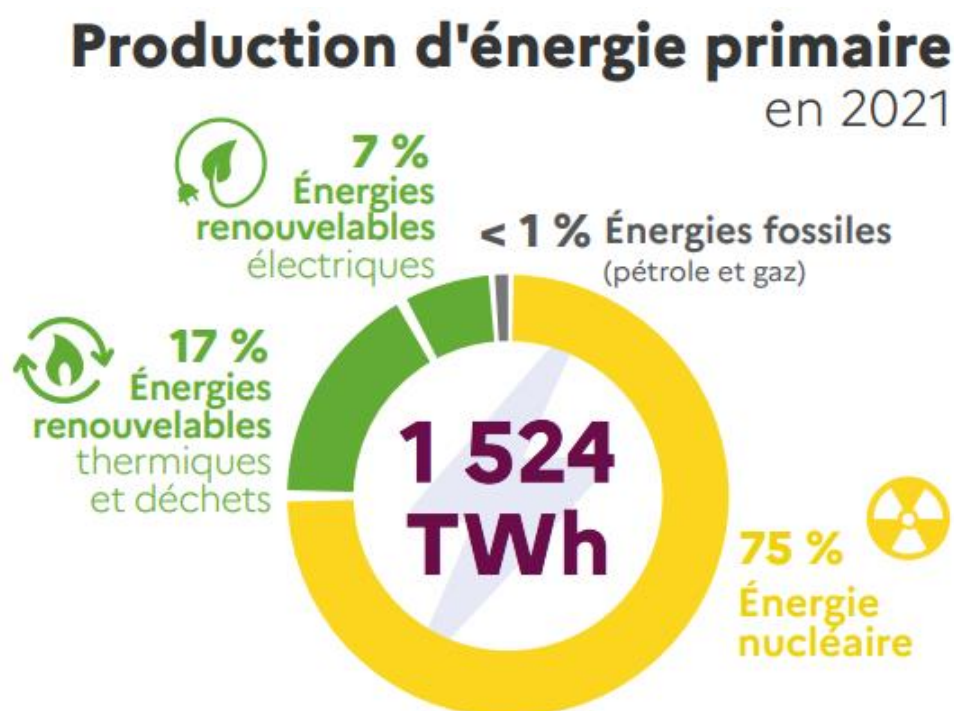
industry in France, initiated in the 1970s, was primarily aimed at guaranteeing France's energy autonomy, following the two oil crises of the 70's. Today, the maintenance of a large nuclear fleet coupled with the development of renewable energies are the answers to both environmental and geopolitical challenges. It is a question of escaping from fossil fuels (oil, natural gas and very marginally coal) which still represent the major part of the energy used in France and are imported from producer countries: Saudi Arabia, Kazakhstan, Russia, Nigeria and Algeria for crude oil; Norway, Russia, Nigeria and the Netherlands for gas. The current war in Ukraine clearly underlines the dangers of being too dependent on certain countries and of being exposed to variations in the price of energy products on world markets, which are very dependent on geopolitical dynamics. Ecological transition and energy sovereignty are thus clearly linked in the French context. This is even more the case as the French low-carbon strategy also excludes massive imports of green gas or decarbonised fuels. However, in France, since the beginning of the 2000s, the uranium used for nuclear power plants is entirely imported. According to the EURATOM Technical Committee (ETC), of the 6,286 tonnes of uranium imported into France in 2020, almost a third comes from Niger (34.7%). The rest comes from Kazakhstan (28.9%), Uzbekistan (26.4%) and Australia (9.9%).

3. MAJOR TRENDS IN THE ENERGY SECTOR

3.1. Main characteristics of the country's energy system

The French energy system is characterised primarily by a largely decarbonised energy production on the territory. As shown in the diagram below, nuclear energy production is dominant and combined with renewable energies (thermal and electrical). Fossil fuels now occupy only a very marginal place in the energy mix. Coal production has been totally abandoned since 2004, when the last coal mine in the country was closed.

**Primary energy production 2021 – source : Chiffres clés de l'énergie – édition 2022*



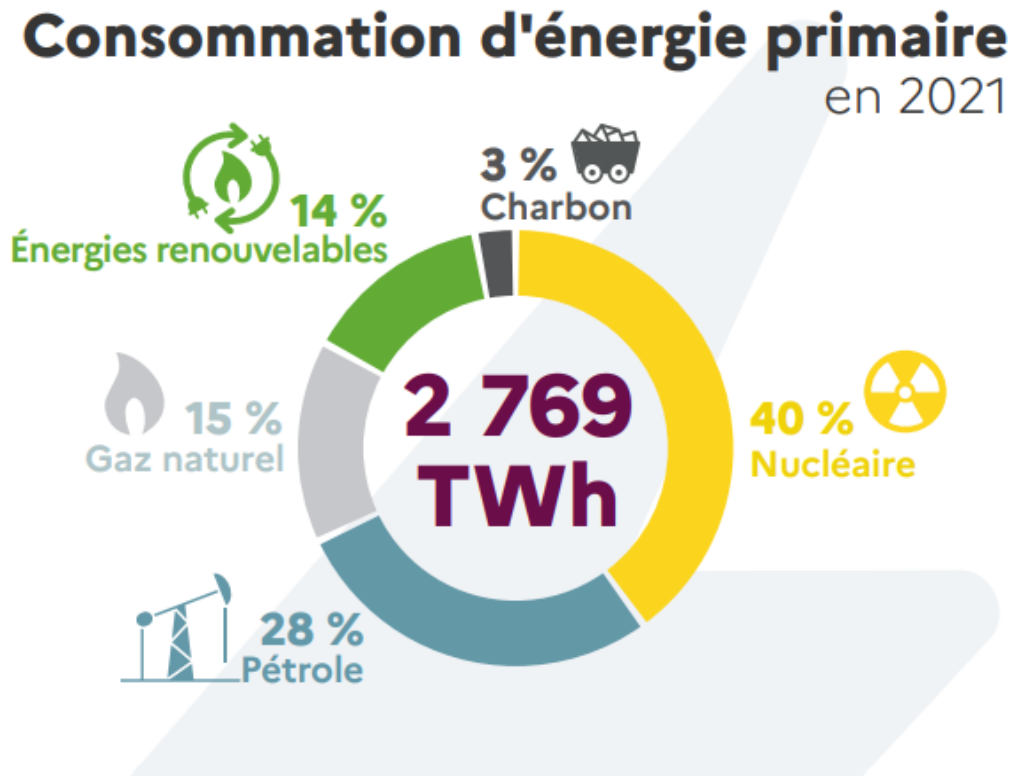
BLUE: fossil energies (oil and gas)

YELLOW: nuclear energy

GREEN: renewable energies (electric on one hand, thermal and waste on the other)

On the other hand, primary energy consumption remains dominated by fossil fuels. Nuclear power accounts for only 40% of consumption, whereas it represents 75% of energy production.

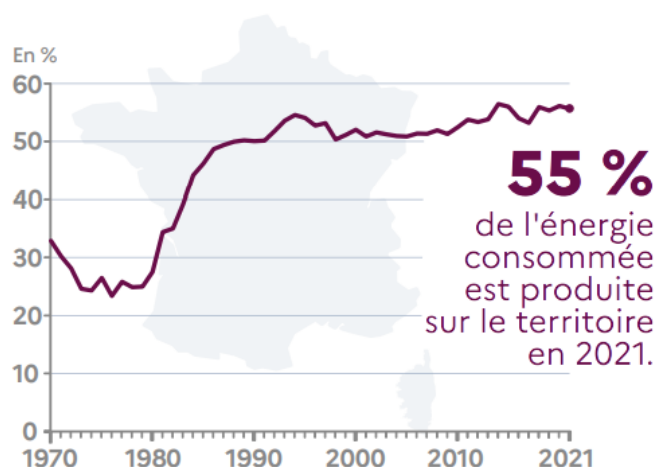
Primary energy consumption 2021 – source : chiffres-clés de l'énergie 2022



The comparison of these data shows a partial energy dependence, as the fossil fuels used but not produced in France must be imported. In 2021, 55% of the energy consumed was produced on the territory, as shown in the diagram below

Energy autonomy – source : Chiffres clés de l'énergie – édition 2022

Indépendance énergétique



This diagram is in line with the [Eurostat Energy imports dependency indicator](#), which was of 44,174% in 2021.

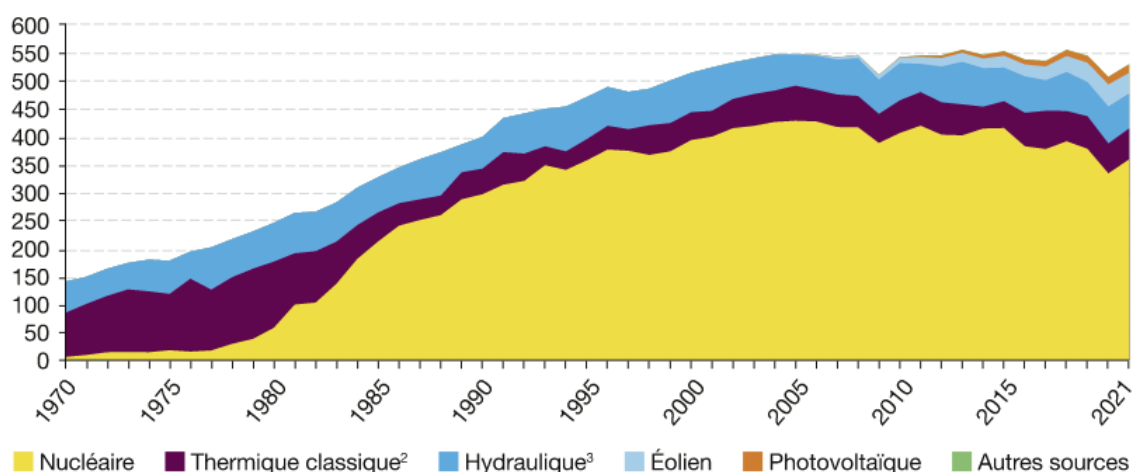
The French electricity mix is predominantly nuclear and, to a lesser extent today, based on renewable energy. The graph below illustrates the evolution of net electricity production by source from 1970 to 2021.

Electricity generation mix 1970 – 2021 – source Chiffres-clés de l'énergie 2022

PRODUCTION NETTE D'ÉLECTRICITÉ

TOTAL : 532 TWh en 2021

En TWh¹



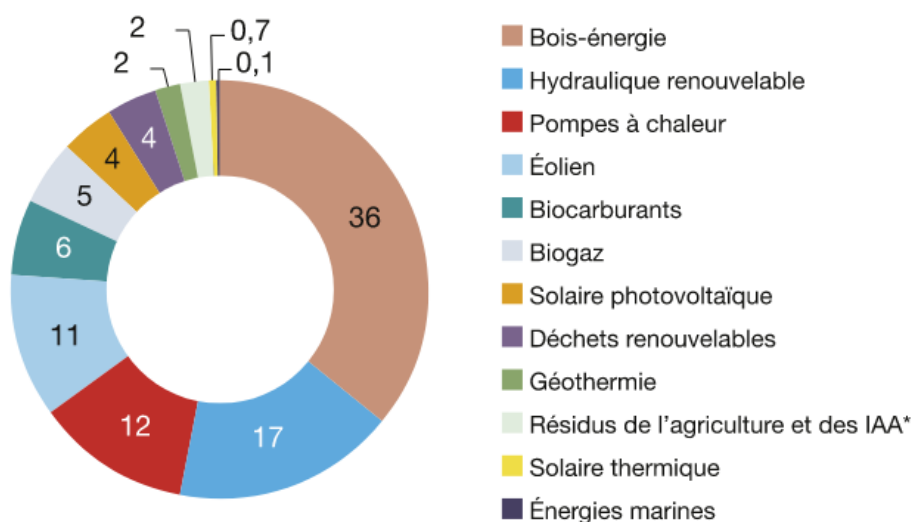
There thus has been a recent and gradual increase in the share of renewable energy in electricity production. In 2021, the primary production of renewable energies in France continued to be dominated by the production of wood energy (36%, i.e. 125 TWh), used mainly for heating, and the production of hydraulic electricity (17%, i.e. 59 TWh). In addition,

renewable heat from heat pumps (12%), wind power (11%), biofuels (6%) and biogas (5%) are also produced.

Primary renewable energy production by sector in 2021 – source: chiffres clés des énergies renouvelables 2022

Total : 345 TWh

En %

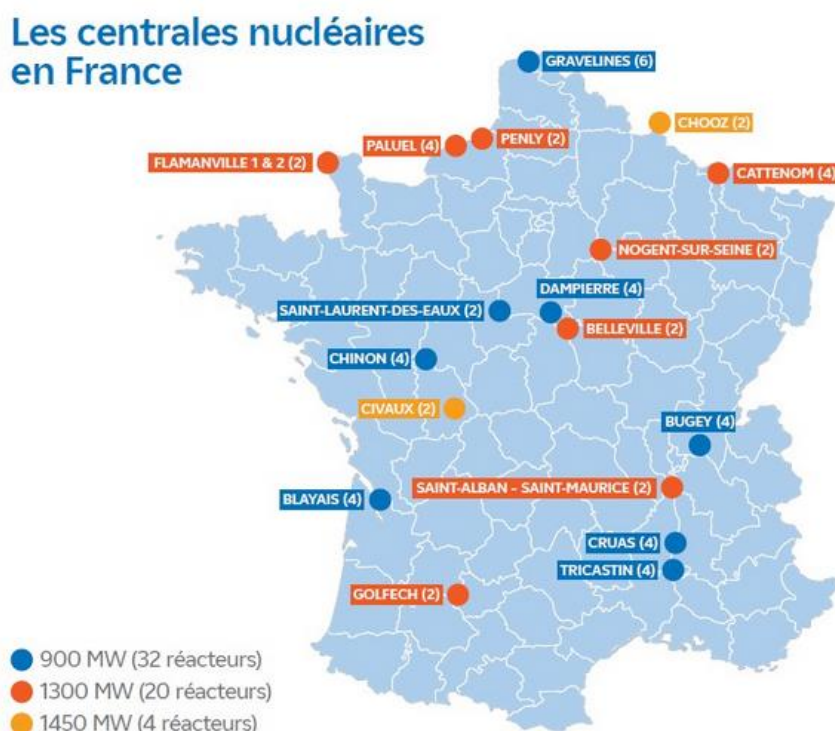


With regard to energy sobriety⁷, it is interesting to observe the evolution of electricity consumption over time. According to RTE, the French electricity transmission system operator, French electricity consumption has remained at relatively stable levels over the period 2010-2019. This trend observed both in France and in Europe, is mainly due to economic (slowdown of growth after 2008, decrease of industrial activities, etc.) and technical (energy efficiency measures within buildings, performance of equipment, etc.) factors.

Finally, the regional distribution of energy production varies according to the source. As regards the nuclear fleet, it is currently made up of 56 reactors spread throughout the country. They are located on 18 nuclear power plant sites, each plant comprising from 2 to 6 reactors (or "unit").

⁷ energy sobriety is the voluntary and organised reduction of energy consumption

Map of nuclear plants – source : EDF company

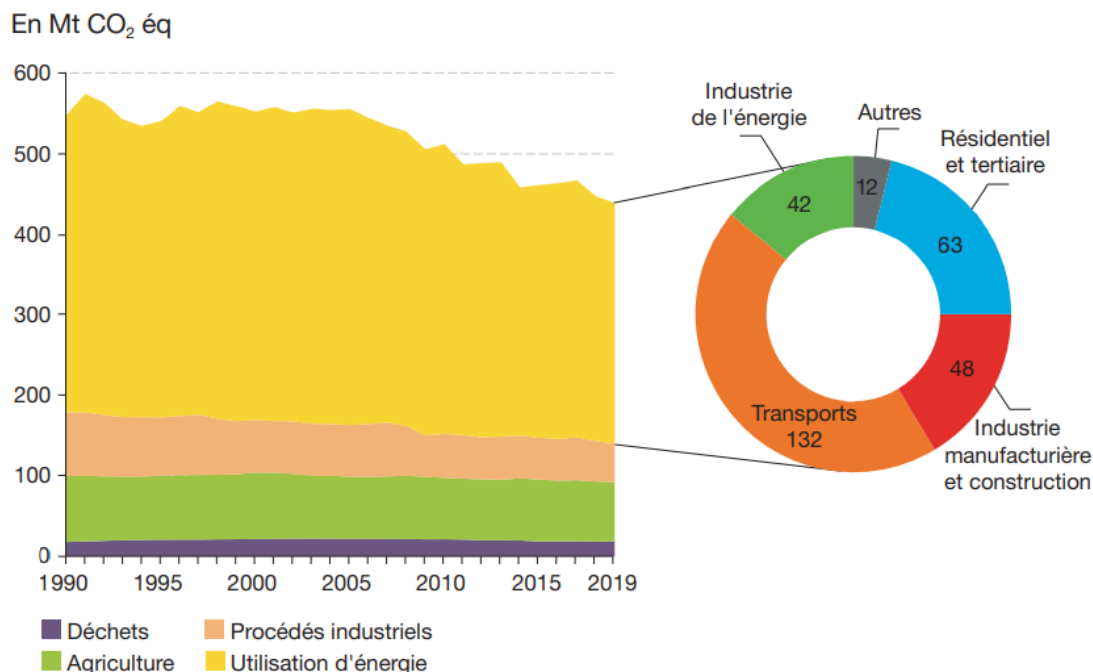


In addition, the decarbonised generation fleet is growing, mainly thanks to onshore and offshore renewables. The French fleet has thus continued to develop in 2022 thanks to the progress of the renewable sectors. Installed capacity reached 144.3 GW on 31 December, an increase of 5.6 GW in one year, including 5 GW of wind and solar capacity. In particular, the solar photovoltaic park reached 15.7 GW on 31 December 2022 (+2.6 GW in one year), the onshore wind park reached 20.6 GW (+1.9 GW) and the first offshore wind farm in France was commissioned in Saint-Nazaire (0.5 GW). The hydroelectric fleet also evolved marginally (+0.1 GW).

3.2. Environmental trends in the energy sector

France differs from the EU in its low share of CO₂ emissions from the energy industry (10% of the national total in 2019), due to the large weight of nuclear power in electricity production. The use of transport was thus the leading emitting sector in 2019, with 132 Mt CO₂ eq, or 30% of the total. In 2019, total emissions decreased by 1.9%. This decrease is concentrated in the energy industry (-6%), the manufacturing industry (-4%) and the residential and tertiary sector (-3%). Over the longer term (1990-2019), emissions from energy use were reduced in all sectors, with the exception of transport (+8%). The most notable decreases were in the energy industry (-46%) and in industrial processes (-39%).

DISTRIBUTION BY SOURCE OF GHG EMISSIONS IN FRANCE BETWEEN 1990 AND 2019 – source : EEA 2021

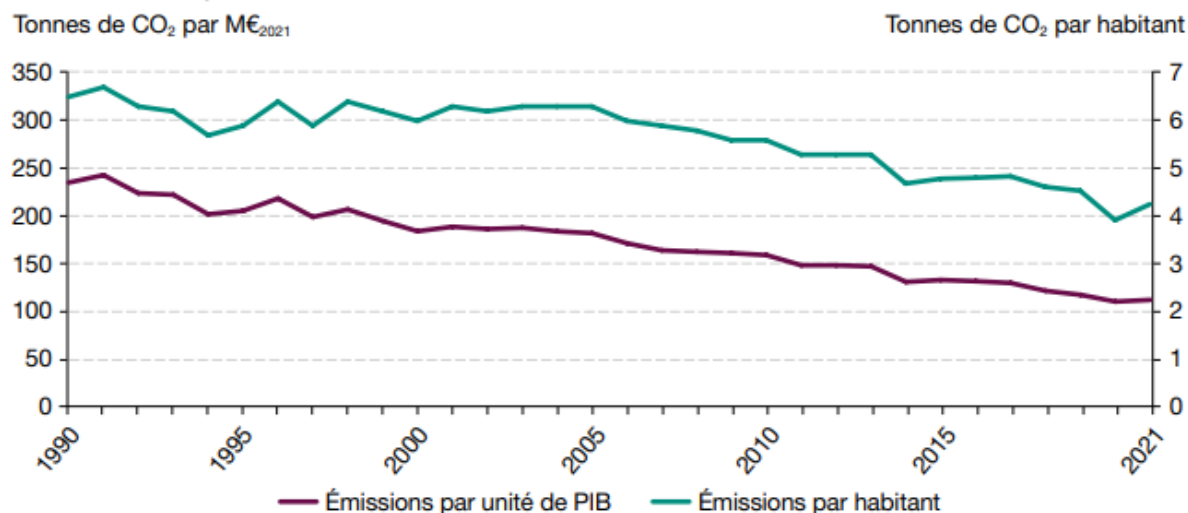


According to the key figures for energy 2022, the rebound in activity following the health crisis and the harsher winter have led to an increased use of carbon-based energy. CO₂ emissions linked to energy combustion in mainland France thus increased by 8.6% in 2021 in real terms (after -13.2% in 2020). In relation to the number of inhabitants, CO₂ emissions linked to energy combustion in mainland France reached 4.3 tonnes of CO₂ per inhabitant in 2021. They increase by 8.3% over one year, after an exceptional drop of 13.4% in 2020, which is much greater than the trend decline observed since the mid-2000s (- 2.2% per year on average between 2005 and 2019). CO₂ emissions relative to gross domestic product increase by 1.5% in 2021, whereas the trend has been downwards since 2005, at an average rate of -2.8% per year. Emissions have thus fallen from 182 t CO₂/M€2021 in 2005 to 115 t CO₂/M€ in 2021.

CO₂ emissions from energy combustion –sources : SDES, bilan énergétique de la France ; INSEE

ÉMISSIONS DE CO₂ LIÉES À LA COMBUSTION D'ÉNERGIE

Par habitant et par unité de PIB



Champ : France métropolitaine.

Sources : SDES, Bilan énergétique de la France ; Insee

3.3. Economic trends in the energy sector

In this respect, the important study conducted by [RTE "Energy Futures 2050"](#) is significant. This study is a prospective one on the evolution of the electricity system with regard to the 2050 objective of carbon neutrality. The study has made it possible to stabilise different scenarios for electricity production and consumption that would help to achieve carbon neutrality by 2050. All of the scenarios selected are based on common assumptions: a reduction in final energy consumption; an increase in the share of electricity; and a strong growth in the use of renewable energies in electricity production. In this context, the evolution of the nuclear sector as well as the eventual share of renewable energies in the French electricity mix vary according to the scenario selected.

The recent relaunch of the French nuclear programme (see above) and the accelerated deployment of renewable energies lead to the targeting of these two sectors.

- *The nuclear industry*

According to the RTE study, doing without new nuclear reactors would imply a faster development of renewable energies than in the most dynamic European countries. This observation underpins the French President's decision to revive nuclear power. The desired increase in the share of electricity in consumption makes it necessary to produce more electricity and from this point of view, the existence of a large nuclear fleet is an asset. However, the current nuclear fleet is old and it is generally accepted that the reactors will probably not be able to operate for more than 60 years. This can justify to adopt an industrial strategy integrating the eventual closure of the current fleet and its renewal through the construction of new reactors. Given the time needed to build new reactors, this is a major industrial and economic challenge

as highlighted by a note published by the Cour des Comptes in November 2021⁸.

The French nuclear industry includes all the players involved in the production of nuclear energy in France (construction, operation/maintenance, fuel, etc.). For the period 2020-2023, the sector includes more than 3000 companies, 85% of which are VSEs/SMEs. Each year, it generates a turnover close to 46 billion euros, including 6 billion euros in exports. Although the majority of nuclear companies are small or medium-sized, there are a handful of major players. Starting with EDF, which is in charge of operating the reactors and ensuring the production, sale and distribution of electricity. For its part, Orano (formerly Areva) covers the stages of the fuel cycle: uranium extraction, enrichment, recycling, logistics, dismantling, etc. The EDF subsidiary Framatome (formerly owned by Areva) specialises in the design and construction of nuclear reactors. In addition, other major groups such as the construction and public works giants contribute to the supply of non-nuclear plant parts and materials (cement, concrete, pipes, etc.). The challenges it faces are, in short: to ensure the extension of the life of reactors; to anticipate the dismantling of the historic nuclear fleet; to allow the development of a new fleet while optimising its cost; to propose sustainable solutions for the management of nuclear waste

- *Renewable energy sources*

Every year since 2008, ADEME⁹ has drawn up an inventory of the markets and jobs associated with more than thirty sectors divided into three main sectors contributing to the Energy Transition (ET), including the renewable and recovery energy sector. Its latest report (2022) therefore offers significant information on the renewable energy market including onshore wind power; photovoltaic solar power; hydroelectricity; domestic aerothermal heat pumps and thermodynamic water heaters; individual wood-fired heating appliances; solar thermal power; wood energy in the collective, industrial and tertiary sectors; geothermal energy; heating networks; energy recovery from household and similar waste through incineration; 1st generation biofuels from the petrol and diesel sectors; biogas from methanisation and from non-hazardous waste storage facilities.

Overall, after a period of stagnation from 2011 to 2016, the market for renewable and recovered energy (RE&R) has been growing since 2017. It reached a new record of €31.3 billion in 2020 (+15% compared to 2018). On the rise since 2016, investments (including exports) in RE&R installations climb by 21% between 2018 (€10.8bn) and 2020 (€13bn). The market for the three main renewable energy sources (onshore wind, hydroelectricity, solar photovoltaic) reached €15.1 billion in 2020 (+16% compared to 2018), thus exceeding for the first time the 2010 record of €13.9 billion. The photovoltaic market saw the strongest growth (+39%) between 2018 (€4.2bn) and 2020 (€5.8bn). Hydroelectricity grew by 8% (€3.4 billion in 2020).

⁸ Cour des Comptes, Les choix de production électrique : anticiper et maîtriser les risques technologiques, techniques et financiers, Les enjeux structurels pour la France, novembre 2021

⁹ ADEME is a public industrial and commercial establishment (“Établissement public à caractère industriel et commercial”), under the supervision of the Ministry for an Ecological Transition and Territorial Cohesion, Ministry for the Energy Transition and the Ministry for Higher Education and Research. It participates in the construction of national and local policies for ecological transition. Its missions, organisation and operation are set out in the French Environmental Code.

- *Sectors under pressure : oil and coal*

In contrast, to the sectors oriented towards economic growth, there are also sectors whose activities are negatively affected by the energy transition. The first is coal-fired power generation. As at 31 December 2020, there were still five coal-fired power generation units active in mainland France, spread over four sites. Those in Le Havre and Provence were closed at the end of March 2021 and the others were scheduled to be closed or converted to biomass, in line with the target of ending coal-fired power generation in 2022. However, this closure plan was disrupted by the war in Ukraine. The coal-fired power plant in Saint-Avold (Moselle), one of the last two plants closed in March 2022, had to be restarted in the winter of 2022 due to the Ukrainian situation and the tensions on the energy market. The other remaining plant (Cordemais in Loire Atlantique in western France) has had its closure postponed to 2026. In addition, three coal-fired power plants remain in the overseas territories. The latter partly use a renewable fuel from sugar cane, named “bagasse”, during the sugar season. Their conversion into 100% renewable units (bagasse-biomass) is underway.

Another example of a sector in transition is the oil industry. Crude oil extraction in France will be 0.7 Mtoe in 2020. Divided by more than three since the end of the 1980s, this production now represents only about 1% of national oil consumption. Moreover, the production capacity of French refineries has been reduced in recent years. National production of refined products, net of refineries' own consumption, will be 36.3 Mtoe in 2020. The trend has been downward since the end of the 2000s, and it has fallen by 27.9% over one year, due to the unprecedented drop in demand caused by the measures taken to combat the coronavirus pandemic, particularly in transport. Exports of refined products fell by a similar amount (-24.5%) to 13.1 Mtoe in 2020. Imports of refined products fall to 44.1 Mtoe in 2020 (- 3.2%), after two consecutive years of increase (+ 6.4% in 2019 and + 2.4% in 2018). After a period of restructuring in the sector, the number of companies has been stable since 2015. Activities are dependent on oil prices and global geopolitics and, at the French level, on the Multiannual Energy Programme and decisions taken in favour of the climate and the ecological transition. The sector represented around 250 companies in 2018. Nearly 80% of the companies are VSEs/SMEs operating in the oil industry in support of extraction, refining or transport and wholesale of fuels on the territory. In 2018, the refining and processing sector comprised around 60 establishments in mainland France, including 8 refineries (+1 in Martinique). The other establishments are dedicated to storage (around 200 oil depots), transport and distribution of fuels and heating oil¹⁰.

The energy sector in the pandemic

France Stratégie¹¹ quickly produced an analysis of the impacts of the pandemic on the electricity system. The pandemic immediately brought a large part of the economic activity to a halt. This resulted in a very sharp drop in electricity consumption and a change in consumption patterns during the day. This led to a drop in market prices: *"this drop in prices and quantities has a*

¹⁰ Voir OPCO2I, Panorama des branches professionnelles 2020, Industries pétrolières.

¹¹ France Stratégie is an expert and forward-looking analysis body on major social, economic and environmental issues, France Stratégie publishes reports and analysis notes, reports to the Prime Minister, makes recommendations to the executive, organises debates, leads consultation exercises and contributes to the ex-post evaluation of public policies

negative impact on the revenues of the various players in the sector, producers, suppliers and network operators". In addition to the mechanical impact of the drop in sales at an already fixed tariff, non-supported producers (EDF, Engie in France) have seen their revenues associated with the quantities they sell on the markets decrease. Overall, it seems that the crisis has weakened the electricity production, transport and distribution system: "The crisis increases the relative share of intermittent renewable energies in electricity production (merit order principle), which increases the volatility of the volumes produced (and as a corollary of market prices) and requires the presence of more flexible means on the network, while these are shut down"; The crisis leads, for reasons related to lockdowns rules or supply difficulties, "to postpone a certain number of maintenance or fuel loading works that were supposed to take place between now and winter 2020 on various production means (thermal power plants - nuclear or fossil - but also renewable energies)".

The energy sector and the War in Ukraine

The war in Ukraine initially caused, in France as elsewhere, a sharp increase in the price of energy sources (oil, gas and electricity) naturally affecting individuals as well as public and private organisations (companies). Faced with this situation, the government adopted a [resilience plan](#) in March 2022 aimed at meeting a large number of objectives, in particular:

- Temporary financial assistance to individuals and companies in the face of rising energy costs (including limitations on fuel prices)¹²
- Strengthening energy independence¹³: securing gas supply for the winter of 2022/2023; accelerating the deployment of renewable energies (see above); supporting the reduction of gas and energy consumption.

In this context, there were tangible concerns about the possibility of energy supply disruptions in the winter of 2022.

3.4. Employment trends in the energy sector

3.4.1 The impacts of the energy transition on employment

The energy sector is not unitary and covers a wide range of economic activities. Therefore, approaching the issue of employment in the energy sector is difficult and can be done at different levels, more or less broad. We have opted here for an approach to employment issues based on two distinct perimeters identified in the course of our work:

- *The energy sector as defined by public statistics*

The energy sector as defined by national statistics (NAF88: 35) covers the production, transport, distribution and trade of electricity, gaseous fuels and air conditioning. It thus includes distribution network operators, suppliers and energy producers. In 2020, this sector employed 136,400 full-time equivalent employees, i.e. 0.5% of total domestic employment¹⁴. On this

¹² In particular those for whom gas and electricity costs represent a high proportion of their expenses

¹³ Despite a national energy production that is already very decarbonised (nuclear and renewable), a significant part of France's energy consumption is still of fossil origin (oil for mobility and gas for heating). About 20 to 30% of gas was imported from Russia and between 10 and 20% of oil

¹⁴ Chiffres clés de l'énergie, issue 2022

perimeter, the 2022 barometer published by the consultancy firm Kyu provides interesting information on the evolution of employment¹⁵. According to the latter, the sector has been confronted with an increase in recruitment tensions since 2015, largely than the national average. Even if these tensions have started to decrease since 2019, this situation seems to be explained both by a shortage of manpower but also by a decrease in the intensity of hiring since 2018 linked to a strategic reorientation of certain major players (outsourcing of certain positions, refocusing on certain activities...), and to digitalization allowing the optimization of certain activities (distribution...). Despite the decrease in tensions, the increase in geographical mismatch can also generate localised tensions. The development of renewable energies leading to a decentralisation of energy production may generate diffuse needs on the territory when the needs linked to energy production were more concentrated around certain activity areas.

- *Understanding employment by economic sector*

The energy sector comprises a variety of economic sectors, which include different professional branches. Some of them carried out analyses relating to the evolution of employment within them. Four¹⁶ of them are mentioned here:

➤ ***The nuclear sector***

Here we mobilise information from the EDEC¹⁷ conducted by the nuclear industry, which led to the publication in June 2022 of an inventory of employment and skills in the industry¹⁸. The latter follows the latest political decisions to relaunch the French nuclear programme. The nuclear industry includes all the players involved in the production of nuclear energy in France (construction, operation/maintenance, fuel, etc.). It represents more than 200,000 direct and indirect jobs. According to the study, from the point of view of jobs, occupations and skills, the nuclear sector is potentially in a favourable position in terms of its capacity to absorb the challenges of 2022-2030. The period 2022-2030 will be a cumulative period for the French nuclear industry:

- Work to extend the operating life of existing reactors (“Grand Carénage”), the construction of new reactors and the increase in work to dismantle reactors and manage waste, not to mention sustained routine maintenance.

- In order to create industrial series effects, all phases of these projects will simultaneously call for a wide variety of trades and skills (e.g. engineering, civil engineering and nuclear safety in 5 years and construction/installation in 10 years). These needs will also be the same as those of other sectors that will maintain and build large facilities, with regional variations in recruitment tensions.

- Finally, technological developments will cross the sector (e.g. development of SMR over the period, digitalisation of the sector, robotisation, predictive maintenance) and will add a

¹⁵ Baromètre KYU des tensions au recrutement - Mai 2022 – Production et distribution d’énergie

¹⁶ 2 other studies of the same nature are mentioned in our annex – qualitative survey synthesis

¹⁷ The commitment to develop employment and skills (EDEC) is an annual or multi-year agreement concluded between the State and one or more professional organisations or branches. They provide technical and financial assistance to anticipate and support the development of jobs and qualifications and thus secure the professional careers of the employees

¹⁸ État des lieux des formations qualifiantes initiales et continues et Cartographie des besoins en compétences, emplois et métiers dans le domaine nucléaire Rapport final – 21 juin 2022

qualitative transformation to the quantitative challenges.

In this context, the study identifies and analyses 60 macro-skills (necessary for the sector or available outside it) and 67 benchmark occupations (covering constant activities, regardless of the company in the sector where it is carried out).

➤ **The electrical sector**

This sector has also given rise to an EDEC (see above) in the context of the energy transition¹⁹. The scope of the sector taken into account by the study is broad. It covers several sectors of the economy: electrical system²⁰; building; industry; urban and transport infrastructures. The activities of the electrical sector cover a variety of professions and skills, from upstream to downstream of the value chain: research and development, manufacturing and distribution of equipment, installation and construction, operations and maintenance. The sector also mobilises support functions (management, financial and legal expertise, asset management, etc.) which can be found in each layer of the value chain.

With regard to the "electrical system" field retained by the study, the total number of jobs estimated in 2018 is 300,000²¹. The nuclear sector accounts for the largest number of jobs (129,000). Renewable electrical energies constitute the 3rd largest source of jobs in the segment (49,000 including more than 12,000 for hydraulic energy) with a significant potential for growth. In total, taking all sub sectors together, the study estimates the weight of the electrical sector at 600,000 jobs in 2018.

Overall, the study estimates that the implementation of the 2020 multi-annual energy programme (see above) will create more than 200,000 additional jobs by 2030. The potential for job creation in the sector is driven in particular by the energy renovation of buildings, with 80,000 jobs, and renewable electrical energy, with 34,000 to 66,000 jobs. The challenge would also be, within the framework of the recovery plan, to ensure that the 600,000 existing jobs and their skills are maintained.

➤ *ADEME's analyses of the renewable energy sectors*

The report produced annually by ADEME (see above) provides an analysis of the direct jobs offered by renewable energy. To do this, it breaks down the different renewable energy sectors into 5 sub-sectors: electrical renewable energy; renewable heat for individuals; collective renewable heat (heat networks), biofuels: biogas.

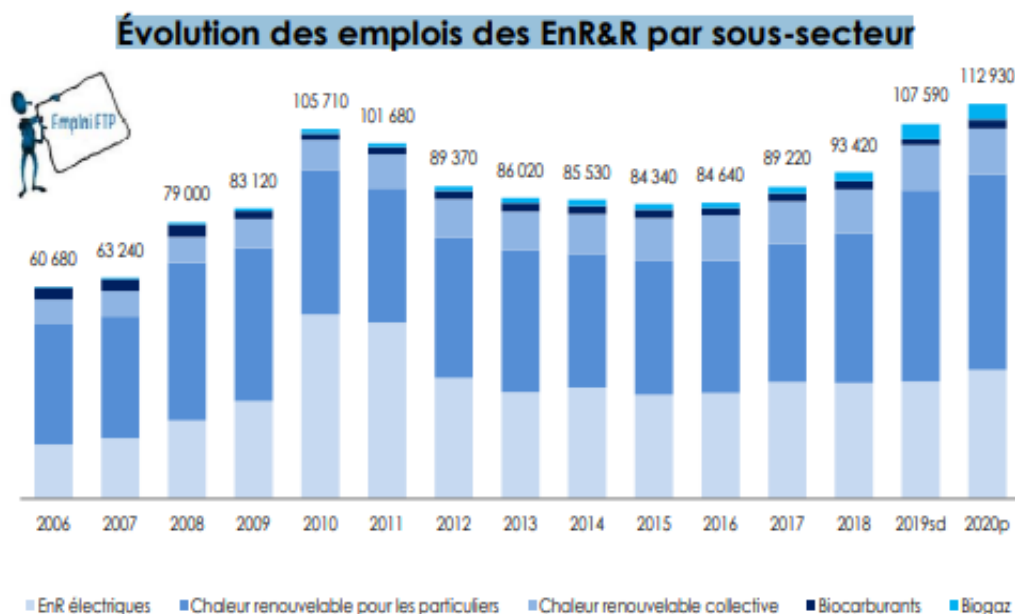
The table below provides an overview of the evolution of direct employment in these different sub-sectors from 2006 to 2020

¹⁹ Etude prospective emplois et compétences de la filière électrique, 2020

²⁰ Nuclear, fossil-fired, renewable (solar photovoltaic, wind, hydro, biomass, biogas)

²¹ The study concerns both direct employment (directly attributable to the activity over one year and on the French territory, specialised in the electrical sector, with a distribution key for electrical/non-electrical jobs for multi-activity) and indirect jobs that mobilise the suppliers and service providers whose main activity (> 50% of turnover) is carried out within the electrical sector. The jobs identified in the study are attached to French companies and French subsidiaries of foreign groups.

Evolution of renewable energy jobs by sub-sector – source : ADEME – 2022



With the exception of biofuels, all sub-sectors see their markets and employment grow between 2018 and 2020. The strongest developments concern biogas through methanisation and storage of non-hazardous waste and domestic heat. As regards electrical renewable energies, in 2020, the three main subsectors of this sector employed 36,890 FTEs, an increase of 11% compared to 2018. Even if it remains the leading employer among the electric renewable energies, wind power saw its workforce decreased in 2019, then in 2020, when it was at 12 680 FTEs (-13% since 2018). On the other hand, photovoltaic jobs are climbing exceptionally well. While they stood at only 6 480 FTEs in 2018, they reach 12 160 FTEs in 2020 (+88%). Hydroelectricity remains an important employer in the sector with 12,040 FTEs in 2020, a level equivalent to 2018 and very stable since 2013.

➤ ***The gas, heat and related energy solutions industry***

This sector has given rise to an EDEC²², which resulted in a prospective study published in April 2022. In the context of the French strategy, the document is based on the idea that *"gas has its place and offers innovative solutions in terms of energy transition, with the gradual replacement of natural gas of fossil origin by biogas, right up to new green decarbonised processes such as hydrogen"*.

The study covers the entire gas value chain: from the transportation of gas (imported natural gas or domestically produced biogas) via gas transport and storage infrastructures, to marketing and distribution to the end consumer (industrial, local authority, private individual), including all energy services, heating networks, installation, operation and maintenance of equipment. This sector is broad, at the intersection of several professional branches, and brings together very varied activities (production, infrastructure, services) and heterogeneous players (from the artisan plumber-heater to the large groups). The sector, as defined in this study, employed

²² Étude prospective des métiers et compétences de la filière des gaz, de la chaleur et des solutions énergétiques associées à horizon 2030

231,400 people in 2021, spread over the five layers in the value chain: production (9,800), transport and storage (11,800), distribution (16,300), marketing and sales (14,500), energy services, equipment and installations (179,000). This last layer, which is very voluminous, includes a large number of small companies that are involved in the installation, operation and maintenance of heating equipment, particularly for private homes. On the other hand, the production layer still has few employees because of the relative weight of natural gas imports. According to the study, it is however on this layer that a large part of the jobs of tomorrow will be concentrated, in connection with the development of green and decarbonised solutions. The employees are unevenly distributed across the regions, with Ile-de-France and Auvergne-Rhône-Alpes in the lead. A very large majority of VSEs and SMEs make up the industry's business fabric (86% of the industry's companies, 58% of employees) alongside the large groups that structure the industry (GRDF, ENGIE, GRTgaz, Terega, etc.).

The prospective scenarios put forward in the study point out a very important potential for the development of the sector and employment for the next decade, if certain conditions are met (a "green acceleration" scenario). The study estimates that 170,000 new jobs could be created in this scenario, mainly in energy services, equipment and installations, but also in the production of green gas (hydrogen and bio methane in particular), which could benefit all regions, including rural areas.

This study has already resulted in concrete initiatives. To ensure the attractiveness of the gas, heat and associated energy solutions sector, the study led to the creation of an ["energy skills" internet portal](#) presenting the sector's skills and job vacancies. The study also led to the launch of an experiment called the "road to gas". The aim of this scheme is "to help people with no qualifications to build their career plans by discovering the jobs in the gas, heat and associated energy solutions industry"²³.

3.4.2 Skill needs and training

The 2015 law on energy transition and green growth (see above) provided for the development by the State, in cooperation with the social partners and local authorities, of an employment and skills programming plan taking into account the guidelines set by the multiannual energy programming. In this respect, the government organised a mission in 2018 to draw up this plan under the direction of Mrs Laurence Parisot. This mission resulted in the submission of an official report in February 2019²⁴. This report first noted the impossibility of identifying the occupations linked to the energy transition by direct extraction from the official nomenclatures available. It then analysed the macro-economic models used in France to assess the potential for job creation linked to the energy transition. In this respect, the report notes the positive dynamics of job creation predicted by these different models but underlines their limitations. In particular, all the models used assume a maximum and theoretical mobility of labour between sectors and territories. The report therefore calls for the integration of a

²³ From June to December 2022, 12 trainees took part in a programme combining training and work placements in Lyon-based companies at all stages of the industry.

²⁴ Plan de programmation des emplois et des compétences, Mission de Préparation, Rapport de la mission confiée à Mme Laurence Parisot, 19 février 2019

training-education component into the macro-economic models used, making it possible to understand the issue of mismatch between labour supply and labour demand.

In addition, the report provides some interesting lessons about the jobs and skills specific to the energy transition. It emphasises that the energy transition is creating few new jobs, but is leading on the one hand to changes in the content of many existing jobs and on the other hand to new ways of working. It also identifies new jobs, which, although not totally new, would play a very important role in the Energy Transition: the energy advisor or energy manager ; the green IT consultant ; Aggregators, dispatchers and traders ; the engineer in materials.

The report also stresses the convergence between energy transition and digitalisation, taking as an example the development of smart grids. It then notes the growing integration of the energy transition into initial training courses at many levels: new courses, new diplomas in vocational education and in university education. It notes, however, that specialised training in carbon capture, storage and reuse, and the recovery and use of waste heat are still very rare. As regards vocational training, the report notes that it is difficult to assess the quantity and quality of vocational training related to the energy transition. This is despite developments, particularly with regard to the introduction of new professional qualifications by the professional branches, including one in the energy sector (professional certificate for air-conditioning operating agents). In this respect, one should add recent initiatives in certain sectors: on 27 April 2021, the French nuclear industry, the Union des Industries et Métiers de la Métallurgie, the Union Française de l'Electricité, France Industrie and Pôle Emploi met for the first time since their commitment to the creation of the "Université des Métiers du Nucléaire / Nuclear occupations University" to adopt the association's statutes. This initiative aims to boost training in the nuclear sector, at regional, interregional and national levels, particularly in critical skills²⁵.

Finally, the report analyses the challenges of developing skills related to the energy sector. It is impossible to repeat these developments in their entirety, but the major challenges are clearly formulated. The different energy sectors do not face the same challenges: some historic sectors are to evolve (nuclear, hydraulic) while others are set to disappear (coal) ; some new but almost mature sectors are to grow (wind energy, photovoltaic solar energy) ; some are still nascent (storage, batteries and hydrogen) or to be developed (electricity networks).

These challenges are all factors in the evolution of skills in the various sectors or branches of the energy sector. From this point of view, the EDECs mentioned above (nuclear, electricity, gas) all contribute to identifying skills needs and ways of meeting them in their specific areas.

In light of those different initiatives to explore the impacts of the energy transition on jobs and skills, one should point out limitations identified through our interviews:

- The 2015 law on energy transition for green growth provided for the establishment of a national programming plan for jobs and skills linked to the energy transition. In the end, however, it was only a preparatory study for such a plan that was published, rather than a programme that would provide practical support for forward-looking management of jobs and skills. For some of the people we spoke to, this failure illustrates the historic difficulty, in the French context, of organising comprehensive support for the

²⁵ This scheme is supported by the State via the France Relance Plan, see above

development of jobs and skills in the context of the ecological transition. We can assume that the absence of such a tool does not facilitate the mobilisation of players at different levels (economic sectors, professional branches, territories, companies) to identify and provide concrete support for changes in jobs and skills linked to the energy transition.

- Sectoral analyses of changes in jobs and skills²⁶ have recently been developed at different levels and in different areas. These studies provide a mapping of jobs and skills and a prospective analysis of their development (from both a quantitative and qualitative perspective) within the scope they define. All of them attempt to identify the needs in terms of jobs and skills generated by the energy transition, and to deduce recommendations for the players in the sector. However, the assessments offered by these studies concerning the risks of job losses may seem limited or imprecise. Based on our interviews, these limitations can be attributed to the fact that some significant uncertainties affecting the future of traditional fossil fuel industries remain: capacity to develop alternative green solutions (biogas, hydrogen, biofuels....) in a strong way, place of those alternatives in the French new energy and climate strategy defined by the Government, etc. In this context, uncertainties affecting possible job losses are strong and depend on a number of factors that are difficult to assess. This raises different questions according to us :

- Will all workers from fossil fuel industries be able to shift to green jobs in their company / group?
- Can we identify cross-functional jobs and skills useful in other companies / sub sectors in the energy sector?
- What are the obstacles workers face to shift from one job/company/ sector to another?

Our survey in annex provides with details regarding those issues. One significant question that remains is how to support employees' professional development, in particular by identifying and organising gateways from one profession to another. The EDEC for the gas industry clearly mentions this need. It remains to be determined at what level(s) (company, territory, country) and within what perimeter (a more or less broad economic sector or several distinct economic sectors from an inter-professional perspective) these gateways should and could be built.

3.4.3 The impact of the energy transition on work organization and working conditions

With regard to the organisation of work, Ms Parisot's report (see above) notes in a generic way that *"the Energy Transition generates an increased need for coordination between professions. The organisation of work is being redesigned with the multiplication of crosscutting contacts between occupations and the de-compartmentalisation of disciplines. In the same way, the Energy Transition brings together different occupations. The installation of photovoltaic panels on roofs involves both roofers and renewable energy specialists. Some activities are on the borderline between different sectors. Given the particular conditions of the job, offshore*

²⁶ Including the EDEC studies in different sectors mentioned above

wind turbine maintenance can be carried out by onshore wind turbine maintenance technicians as well as by professionals specifically trained for this type of repair. For all executives and managers exercising project management, coordination and supervision functions, the Energy Transition implies adopting a systemic approach that is as global as possible. If there is one attitude that the Energy Transition should encourage, it is mutual adjustment. Basically, the real new skill that a successful Energy Transition requires is collective competence”. These observations would deserve to be examined in greater depth in relation to specific contexts.

With regard to occupational health and safety issues, we can briefly mention the analyses conducted on occupational health and safety issues in certain sectors. For example, the INRS²⁷ has devoted analyses and tools to the identification and prevention of risks in the onshore wind energy sector²⁸, but also in the installation of photovoltaic panels²⁹, since 2010, in connection with the development of solar energy. In addition, given the long history of the nuclear industry in France, a great deal of work has been done in the past on working conditions in this sector and the associated subcontracting³⁰. More recently, the issue of health and safety in the offshore wind energy sector has attracted attention due to the expansion of offshore wind farms in France. [Work to assess the health and safety risks for workers in this sector](#) has been announced for 2021 by the Pays de la Loire CARSAT³¹, in connection with the opening of the first French offshore wind farm in Saint Nazaire in September 2022.

3.4.4 The territorial and regional impacts of the energy transition

In the French current context, the territorial impact of the energy transition can refer to two distinct dimensions:

- The impact linked to the closure of energy production infrastructures in the context of the abandonment of fossil fuels or the reduction/renewal of nuclear power plants
- The impact linked to the development of renewable energies, which, by definition, are characterised by their territorial dispersion

➤ *Site closures*

As explained above, France first embarked on a process of closing down coal mines (completed in 2004), and then on a process of completely closing down coal-fired power plants. In this respect, a very recent study carried out by the Climate Action Network and the Veblen Institute aims to examine the exit from dependence on fossil energy from the point of view of its social and territorial impacts³². In particular, it analyses the support system set up by the State from 2019 (the aforementioned 2019 Law) for the workers of the last coal-fired power plants.

²⁷ INRS is a scientific and technical body in charge of promoting health and safety at work

²⁸ Parcs éoliens terrestres – Prévention à la conception, INRS, 2020. This publication is specific to the design phase of onshore wind farms.

²⁹ Pose et maintenance de panneaux solaires thermiques et photovoltaïques, fiche pratique de sécurité, ED 137, INRS

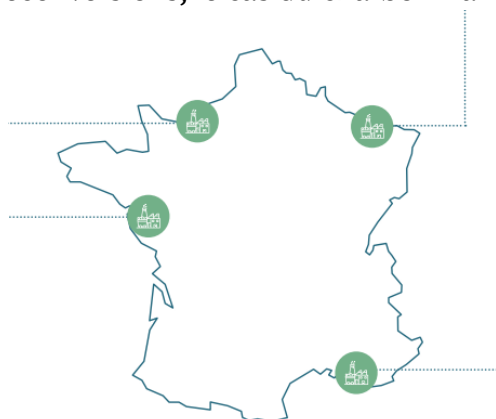
³⁰ See for instance, Vie , travail, santé des salariés de la sous-traitance du nucléaire, Références en santé au travail n°136, INRS, décembre 2013

³¹ A CARSAT is a regional fund of the French social security system in charge of managing employees' pension insurance and occupational risk prevention

³² C.Duriez, J. Hallak, Relever les défis des reconversions, le cas du charbon français, Réseau Action Climat et Institut Veblen, 2022

The development of coal-fired power stations in France began at the beginning of the 20th century and experienced a boom in the 1960s (more than 15 units commissioned). It was the country's main source of electricity production, along with hydroelectricity, until the 1970s (and the development of nuclear power). Several dozen units were closed because they were too old in the 1990s, 2000s and 2010s. As for the most recent production units, they opened at the beginning of the 1980s on the sites of Cordemais (382 employees), Le Havre (171 employees), Saint-Avold (87 employees) and Gardanne (98 employees). These are the ones targeted by the total closure initially set for 2022.

Map of French coal-fired power stations – source : Relever les défis des reconversions, le cas du charbon français (2022)



In this context, the closures, apart from the employees directly affected, also affect, according to the study, 206 port employees and 500 employees of subcontracting companies. More generally, the study clearly shows how much, historically (since the beginning of the 1970s), the abandonment of coal was conceived as a territorial issue (including in anticipation and at the time of the closure of the coalmines). This justified the involvement, also historically, of a multiplicity of actors in charge of territorial redevelopment, thus in charge of diversifying local economies away from a declining sector³³. In the context of the last four French coal-fired power stations, this consideration of the territorial impact of closures was given concrete form in the signing, in 2020, of territorial pacts involving the State, local authorities, public agencies (such as ADEME, see above) and the companies concerned. These pacts aim to define a 5-year economic diversification strategy, co-piloted with the different public and private actors. The study analyses in detail these different pacts, which also contain an "employment" section, often not very precise (except in the case of the Gardanne power plant) to organise reconversion and mobility towards other sectors³⁴. An important point underlined by the study is the time lag between territorial reconversion actions (often long term) and those aiming to allow the

³³ This point is not specific to the energy sector but concerns all the major industrial restructurings that the country has undergone over time (e.g. steel industry)

³⁴ For an analysis of the employment opportunities offered by renewable energy in the 4 affected territories, see also ADEME, *Marchés et emplois liés aux filières ENR&R dans les territoires impactés par la fermeture d'une centrale à charbon*, Synthèse, Septembre 2019

reclassification of employees (necessary in a short time). This time lag does not facilitate employee mobility. Finally, it should be noted that the study states that there is no publicly available progress report on the pacts (in 2022). In short, although the territorial impacts of the abandonment of coal are clear (from the point of view of the reconversion of employees and the diversification of the territory), the anticipation and support of these impacts seem to suffer from numerous limitations.

One can identify the territorial dimension of the energy transition in other sectors. For example, Mrs Parisot's report (see above) stresses, with regard to the nuclear industry, that *"in terms of jobs and skills, the closure of a power station cannot be limited to the substitution of one energy production for another, but implies the definition of a new orientation and attractiveness for an entire territory"*. This is exactly what the case of the closure of the Fessenheim nuclear power plant (3 June 2020), which affected nearly 2,000 direct, indirect and induced jobs in eastern France (Alsace), shows : the particular difficulty of ensuring the reconversion of a territory faced with the disappearance of a fundamental economic activity on its scale.

➤ The development of renewable energies

On a more positive note, the desire to develop the use of renewable energies also highlights the territorial dimension of the energy transition. ADEME has thus developed, with the Climate Action Network, a tool called TETE (Transition Energétique Territoires Emplois) which makes it possible to estimate the direct and indirect jobs created and maintained, vulnerable or in decline, according to the transition scenario envisaged. On this basis, ADEME recently conducted a study of the impact of the energy transition on employment and the economy in the Grand Est Region³⁵. It takes into account various economic sectors linked to the energy transition: renovation of residential and non-residential buildings; renewable and recovery energies (development of heat networks; renewable electricity; renewable heat, agrofuels and biogas); transport (of people, goods, and distribution of fossil fuels). According to the study, achieving the most positive scenario depends on the joint mobilisation of the various players in the area (public authorities, economic development, employment and training players, companies, etc.). This example thus shows the need for multi-actor cooperation at the territorial level to implement a desirable energy transition.

3.5. Drivers, Barriers and dilemmas to the energy transition: obstacles and limits for a just energy transition

A general dilemma related to the French context probably relates to the role and future of the nuclear industry. The choice made by the government and a part of the society to maintain and renew the nuclear park, as a solution to produce enough decarbonised electricity, has clearly raised a debate between those people betting on nuclear and those thinking it should be abandoned for diverse reasons³⁶. Beyond this significant discussion, we report here first general remarks at different levels.

➤ National level:

³⁵ Transition énergétique en Grand Est : quels impacts sur l'emploi local ?, Expertises, ADEME, Novembre 2020

³⁶ In light of this, see the debate around the recent comic "Le monde sans fin"(2021), published by a well-known expert M. Jancovici and the [critics of this publication](#)

The current French strategy is mainly based on the maintenance and development of electricity production capacity, through the maintenance and renewal of the nuclear fleet and the development of renewable energies and France's energy sovereignty. As such, it is a decisive factor in the transition to fully decarbonised energy.

In this context, several types of difficulties can be observed, notably mentioned by the National Council for Ecological Transition³⁷ and the High Council for the Climate³⁸:

- a sometimes insufficient readability of the global strategy adopted, a strategy still in evolution (see above: future programming law on energy planned for 2023, while specific acceleration laws on nuclear and renewable energies are being adopted)

- technical and financial obstacles: time needed for the possible renewal of the nuclear fleet; the ageing of the existing nuclear fleet ; the human and financial resources needed to structure certain renewable energy sectors (green hydrogen, for example) ; the delay in the development of renewable energies ; new methods of storing the energy produced; adaptation of the electricity transport and distribution network, etc.

- Obstacles relating to the management of human resources required by the ecological transition: limits or absence of overall planning of the impacts in terms of jobs, skills, training and working conditions generated by the transition

- Political obstacles: the need to make the energy transition acceptable (social acceptability of the development of wind turbines; nuclear safety issues, etc.); guaranteeing energy sobriety in the long term.

- Sectoral and territorial level:

The ability to anticipate the impacts of the energy transition at the level of economic sectors, professional branches and territories is certainly a key factor in organising a fair transition. It nevertheless assumes effective and efficient cooperation between a diversity of actors depending on the level considered. In this respect, a variety of tools exist and can be mobilised at least in theory: sectors strategies, industrial site transition tools, Ecological Transition Contracts³⁹, etc.

4. SOCIAL DIALOGUE, INDUSTRIAL RELATIONS AND INNOVATIVE PRACTICES IN SUPPORT OF THE ENERGY TRANSITION

4.1. Industrial relations systems in the energy sector

The energy sector is, in terms of social dialogue, fragmented between a lot of different professional branches. It is at the level of these branches that collective bargaining is conducted. In the face of this fragmentation, it should be noted that large companies in the energy sector integrate a wide range of activities upstream and downstream of the energy value chain. They may therefore apply different branch collective agreements depending on the main economic

³⁷ The National Council for Ecological Transition (CNTE) is a French administrative commission of an advisory nature created in 2013. The CNTE is especially consulted on bills whose main subject is the environment and/or energy. Peak level unions, employer organisations as well NGOs dedicated to the protection of the environment are represented in this Council.

³⁸ Haut Conseil pour le Climat, rapport annuel 2022

³⁹ See below section 4 for more developments about those different tools

activity of their components/subsidiaries. In accordance with Article L. 2261-2 of the Labour Code, the collective agreement applicable to the employees of a company is the one that covers the main activity carried out by the employer. This rule is assessed for each company constituting a distinct legal entity, so that subsidiaries of the same group may be covered by different collective agreements depending on their main activity, which is determined with regard to the number of employees assigned to this activity or the turnover achieved. Thus, the main activity rule also applies to operators in the energy sector, so that the subsidiaries of large energy groups specialising in support activities must apply the provisions of the collective agreement relating to their main activity.

In this context, for want of completeness, we briefly mention some professional branches of the energy sector. Globally, at this level, energy transition is not an explicit topic for collective bargaining.

- **The professional branch of the electrical and gas industries (IEG)**

This branch covers companies engaged in the production, transmission, distribution, marketing and supply of electricity and gas, **whose staff are covered by the specific national statute for the electricity and gas industries**. As of 31 December 2021, this branch comprised 157 companies and 135,789 employees. 93% of the employees worked in the companies that came out of the two historical public companies EDF and GDF: EDF SA, ENEDIS, RTE, ENGIE SA, GRTGaz, GRDF, STORENGY, ELENGY; the other employees were employed in more than 148 public utilities, cooperatives, gas and electricity production or distribution companies with between 1 and 1,400 employees. The creation of this branch, and the related social dialogue, is linked to the liberalisation of the energy sector by the law of 10 February 2000.

The companies in the sector are represented by two employers' organisations: the Union Française de l'Electricité (UFE) and the Union Nationale des Employeurs des Industries Gazières (UNEmIG). Since 2021, 4 trade unions are representative in the sector: the CGT (39.68% of the votes in the professional elections), the CFE CGC (managers - 26.74%), the CFDT (17.46%) and the CGT FO (16.12%)

At branch level, collective agreements are negotiated on a wide range of subjects: social activities, family rights, professional equality, vocational training, jobs and skills, vocational training and work-linked training, pay, health and safety at work, social protection, etc. The 2021 collective bargaining report for the branch⁴⁰ shows that 126 agreements or amendments have been signed since 2001. They mainly concern

- Wages (30 texts)
- Social protection (17 texts)
- Professional elections (11 texts)
- Social dialogue (9 texts)
- Professional equality (9 texts),

Only a negotiation, entitled "Securing career paths and mobility", aimed in 2021 to clarify the role of the branch, to renovate and simplify the management of mobility within the branch

⁴⁰ SGE des IEG, la négociation collective au sein de la branche des IEG 2021

(transparency of the offer, attractiveness of the branch, simplicity of the processes) and to provide the branch with a reference framework to accompany restructuring resulting from decisions by the public authorities. It gave rise to an agreement signed on 30 November 2021 by two out of four representative trade union federations. However, it did not result in an applicable agreement because the two other trade union federations, which are representative and have a majority in the sector, exercised their right to oppose the agreement reached.

- The oil branch

The oil industry is divided into two distinct branches: the oil industry branch and the oil trade branch. Both are subject to separate collective agreements.

The oil industry branch, which we will focus on, covers extraction, refining and some petrochemical activities and the distribution of fuels. These activities are governed by the collective agreement of the petroleum industries (dated 3 September 1985). According to the overview of the sector⁴¹ *"after a period of restructuring in the sector, the number of companies has been stable since 2015. The activities are dependent on oil prices and world geopolitics and, at the French level, on the Pluriannual Energy Programme and the decisions taken in favour of the climate and the ecological transition (idem at the European level with Green Deal). They have also been impacted by the pandemic"*. In 2020, the sector's workforce remains stable over time at around 33,000 employees in total. The vast majority of employees are employed by large companies, led by the Total Energies Group. The move towards low-carbon economies will lead to a reduction in the consumption of oil products in the medium term. In this context, Total Energies has announced or initiated major projects: conversion of refineries for the production of biofuels, partnership projects with other companies in other sectors for the production of green hydrogen (ENGIE) and batteries (Stellantis).

In social dialogue processes within this professional branch, the companies are represented by Ufip Energies et Mobilités, a name that succeeded that of the "Union Française des Industries Pétrolières" (UFIP) in 2022. Since 2021, there have been four representative trade union organisations: the CGT (32.24%), the CFE CGC (32.04%), the CFDT (24.66%) and the CGT FO (11.06%).

The topics of negotiation are primarily traditional ones (wages, vocational training, health and safety at work, provident fund, etc.). Nevertheless, there is a collective agreement dated 1 June 2018, signed by the CFE CGC and the CFDT, on employment, maintaining employment and developing skills. This text is general and states in its preamble : *"the oil industries have been implementing regular reorganisations and restructurings for several decades due to the industrial, economic and technological changes that impact them"*. And that *"these reorganisations and restructurings may have consequences on the jobs carried out and the qualifications required within the companies in the sector, on the number and composition of the jobs available, on the career paths and professional development of the employees in the sector"*.

- The energy efficiency services sector

The sector covers energy efficiency services activities through the installation and operation of production systems, distribution networks and energy recovery, mobilising jobs and local

⁴¹ OPCO 2I, Panorama des branches professionnelles 2020, industries pétrolières

supply chains⁴². In terms of social dialogue, this sub-sector covers two distinct professional branches and therefore two distinct collective agreements: the branch of the exploitation of thermal and climatic engineering equipment on the one hand and the branch of thermal and air conditioning equipment management companies on the other.

FEDENE is the employers' organisation for the sector and a partner in collective bargaining for the two professional branches in question. The representative trade union organisations differ, however, depending on the branch in question. In the "operation of heating and air-conditioning equipment" branch, since 2021, the leading organisation is the CGT (34.08%), followed by the CFDT (32.63%), the CGT FO (24.35%) and the UNSA (8.94%). In the "heat and air-conditioning equipment management companies" branch, the leading organisation since 2021 is the CFE CGC (49.50%), followed by the CFDT (26.59%), the CGT FO (12.60%) and the CGT (11.31%).

According to the OPCO 2I mentioned above, the sector will continue to grow, as *"energy saving is a key issue for all private and public players who are making major investments in their networks and climate systems, driven by government incentive policies and the search for ways to reduce costs"*. In this context, *"the sector recruits every year, but has difficulty finding suitable technical profiles, particularly due to a lack of initial training in the specialised skills of heating engineers, refrigeration engineers, electromechanics, energy performance engineers and management positions, particularly unit or operational managers"*. *"Technological developments and the challenge of energy optimisation, mainly through the collection of data (connected objects), their processing (big data) and the control of interconnected systems (Smart Grids), with a view to the possible applications of artificial intelligence, lead to recruitment and training needs, particularly in the field of design (BIM) and digital technology. In addition, new issues are emerging, particularly those of indoor air quality and biomass gasification, which require new scientific and technical profiles"*. It seems to us that we can find traces of these issues in two recent collective agreements (December 2021) of the branch of thermal and air conditioning equipment management companies. These two agreements, one relating to professional and managerial staff and the other to other categories of staff, aim to implement the work-linked promotion scheme known as PRO A⁴³. They identify the professional qualifications required to meet the needs of the sector and refer directly to some of the objectives of the multi-annual energy programme: increasing the production of energy from renewable sources, reducing energy consumption, improving the energy efficiency of buildings, democratising local energy production.

4.2. Position of social partners with regard to the energy transition

As already mentioned, the energy transition concerns many sub-sectors and professional branches if we take into account the organisation of social dialogue. For example, in the case of the electricity sector, it may cover both the players in the electricity system (and, within them, those from the various activities concerned: electricity production, transmission and distribution networks, etc.) but also those in the building sector, industry (including energy efficiency

⁴² See OPCO 2I, Panorama des branches professionnelles 2020, services d'efficacité énergétique

⁴³ This scheme is provided for in the Labour Code (Article L. 6324-1). The purpose of retraining or promotion by alternation is to enable the employee to change trade or profession, or to benefit from social or professional promotion by means of training or by means of actions enabling the validation of acquired experience

services) or urban or transport infrastructures. Similarly, the development of renewable energies concerns both energy production and the construction of the infrastructures themselves (wind turbines, etc.). Therefore, the social partners involved are diverse and fragmented, often organised in relation to the different existing professional branches.

In this context, we briefly mention the public positions of several organisations, both employers' and employees' unions, mainly covering the electricity and gas industries. The energy transition and its impact is generally a subject that is widely addressed through analyses and demands. On the employers' side of the electricity and gas industries, the Union Française de l'Electricité (UFE) published, in December 2021, its vision of an "[energy transition at the service of the French people](#)" in view of the 2022 presidential elections. This publication mentions in particular: *"The foundation of the energy system will be the decarbonised electricity fleet. It will mobilise numerous sectors and ensure a balance between a renewable and variable production share (solar, wind) and a controllable share based on nuclear, hydraulic, decarbonised thermal power stations and the flexibility that networks, storage and the customers themselves can now provide. The ambition is so great that it is urgent to act. This requires rapid choices concerning both renewables and France's nuclear assets"*.

On the trade union side, the FNME-CGT, the CFE CGC Energies, the FCE-CFDT and FO Energie et Mines, representing the French energy sector of the Electricity and Gas Industries, were able to adopt common positions with regard to the challenges linked to the energy transition in France. In [July 2022](#), these organisations reacted very favourably to the inclusion of nuclear energy and gas in the European taxonomy and jointly stated their demands:

- Extend the French nuclear power fleet as widely and as long as possible
- Rapidly renew the French nuclear fleet to ensure the long-term survival of a major tool for decarbonisation and sovereignty, *"the fruit of an industrial sector of excellence whose skills must be perpetuated in favour of the country's reindustrialisation objective"*
- Accelerate the development of renewable gases, allies of energy sovereignty and the territorial circular economy

On reading these general guidelines, it is not surprising to see that the trade unions in the sector are committed to defending the sustainability of traditional sectors (nuclear and gas) and their jobs, while trying to consider environmental issues.

These positions can be supplemented by others at the level of each trade union organisation. For example, in September 2020, the CGT drew up a progressive energy programme⁴⁴. This rich document calls for the reconstitution of a national public energy service that includes energy efficiency and performance, the right of citizens to access energy, the removal of energy from the spectrum of commercial activities and strong social guarantees for all workers in the energy sector. This last point is interesting because it refers to the demand for the application of the specific employment status of the electricity and gas industries (IEG status) to all workers in the energy sectors (instead of the diversity of collective agreements applicable to different activities within the major energy groups). In 2022, in the context of the energy crisis, this organisation has also taken a clear position in favour of a moratorium on the closure of the last French coal-

⁴⁴ FNME CGT, Programme Progressiste de l'Energie, Répondre aux besoins énergétiques et lutter contre le réchauffement climatique, septembre 2020

fired power stations.

For its part, in January 2023 (in reaction to the government's nuclear acceleration bill, see above), the CFE CGC Energies reiterated its support for "*a competitive electricity production base, based on decarbonised, controllable means of production, including nuclear power, that are sufficiently large to meet growing electricity needs*". However, it regrets the absence to date of a global energy strategy from the State and stresses the need, in order to accompany the revival of the French nuclear industry, for "*a solid planning of jobs and skills*".

Finally, the CFDT confederation, at the cross-industry level, has also taken a detailed position on the energy transition by publishing, in March 2022, an argument "*for a fair energy transition*"⁴⁵. This document argues in favour of a transition combining "*sobriety, efficiency and decarbonisation with an open energy mix*". The latter should be based on the exploitation of all forms of biomass, the development of solar and wind farms and the reinvestment in nuclear power. The document also stresses the importance of achieving a just transition that also integrates issues related to employment, job quality, skills and working and living conditions (using existing legal instruments to anticipate and mitigate the negative impacts of restructuring, including at territorial level).

4.3 Role of the social dialogue in support of a socially just energy Transition

It is difficult to provide generic information on the role that social dialogue plays in relation to the imperative of a fair energy transition, because:

- The energy sector is fragmented into a multiplicity of professional branches, more or less numerous depending on the limits assigned to the energy sector.
- The issues raised are diverse: changes in jobs and skills in declining or developing sectors; support for changes resulting from the promotion of a decarbonised energy mix; professional mobility; working conditions and health at work, etc.

This being the case, we have seen that the traditional actors of social dialogue in the energy sector (employers' organisations and employees' unions) are all questioned by the energy transition and particularly by the conditions for a fair transition. To this extent, it is clear that this objective cannot be tackled at a single level of social dialogue, but rather requires an articulation of initiatives at different levels. Moreover, moving towards a just energy transition probably also presupposes that other actors act jointly with the traditional actors of social dialogue, at least at different levels.

In this context, given the limited nature of our research, we distinguish several levels

- *The national and strategic level*

In this respect, it is interesting to note the recent developments in cross-industry social dialogue in France. Since a national agreement concluded in April 2022⁴⁶, the social partners have decided to institutionalise their previous practices by setting up an autonomous joint

⁴⁵ CFDT, [Argumentaire pour une transition énergétique juste](#), Mars 2022

⁴⁶ The National Interprofessional Agreement of 14 April 2022 "For an ambitious paritarism adapted to the challenges of a world of work in profound change" was signed by all the trade unions, with the exception of the CGT, and the three employers' organisations: Medef, U2P and CPME

economic and social agenda. The aim is to set up a "*space for continuous social dialogue*". This should allow for dialogue on economic, social and environmental issues and establish, as far as possible, common positions between the organisations: "*a new approach to interprofessional social and economic dialogue. It is a question of working together on a series of concrete subjects, which demonstrate that social dialogue is useful, that paritarism can be renewed, and that it allows companies to be supported in managing transitions*" (MEDEF, 2021). A list of dialogue topics was thus set at the beginning of 2021. The climate and energy transition in companies is one of the topics for negotiation. As a result, a negotiation was opened in July 2022 on the ecological transition and social dialogue. This negotiation is still ongoing and does not really target the decarbonisation of the energy sector and its impacts. Moreover, it should not lead to binding provisions but rather to tools to support companies in their ecological transition in general. The fact remains that this space for dialogue constitutes a possible lever for intervention by the social partners at national and cross-industry level that could potentially be mobilised to contribute to a fair energy transition.

Beyond, the establishment at national level of a programming plan for jobs and skills, particularly in the energy sector⁴⁷, was provided for since the 2015 law. The latter obliged the State to draw up this plan in consultation with the social partners and local authorities. However, it does not seem that the report on the preparation of this plan has been followed up to date. On the other hand, there is little doubt that the ambition to build such a programming of jobs and skills at national level should mobilise the actors of social dialogue.

In this context, we can quote one of the recommendations of the aforementioned report by Mrs Parisot in 2019: "*Setting up an information-sharing body bringing together the Ministries of the Environment, Economy and Finance, Labour, representatives of the CNI (National Industry Council), employers' organisations and employees' organisations, meeting twice a year. The management of the energy transition requires a better simultaneous consideration of energy issues, the specific problems of the industrial sectors and the social issues of reconversion and local revitalisation*".

- *The level of professional branches and economic sectors*

At the level of professional branches, Article L. 2241-12 of the Labour Code provides that the organisations bound by a branch agreement or, failing that, by professional agreements, meet at least once every three years to negotiate on the forward-looking management of jobs and skills, particularly to meet the challenges of the ecological transition⁴⁸. From this perspective, it is therefore possible for these subjects to be negotiated at this level. We can thus identify agreements relating to the development of jobs and skills in certain branches: for example, the agreement of 1st June 2018 on employment, maintaining employment and developing skills in the oil industries.

However, it may seem difficult to deal properly with employment/skills issues at the level of

⁴⁷ See the report by Ms Parisot, which has already been quoted several times

⁴⁸ This reference to the environmental dimension (to be taken into account in forward-looking management of jobs and skills) results from the Law 2021-1104 of 22nd August 2021 "combating climate change and building resilience to its effects"

professional branches alone, given the global impacts of the energy transition, which affect a variety of economic activities. This is why initiatives relating to economic sectors and covering various professional branches have been developed. This is the case of the EDECs already mentioned above: economic sector of gas, heat and associated energy solutions, economic sector of electricity, sector of nuclear occupations. These works, which aims to map the changes in jobs and occupations within the selected perimeter, involves employers' organisations and trade unions from different professional branches. It clearly illustrates the need to identify the relevant economic perimeter to be considered and therefore transcends the level of the professional branches.

From a similar economic perspective, mention should be made of the National Industry Council⁴⁹. This Council includes strategic sector committees: each strategic sector committee corresponds to a strategic industrial ecosystem. Each one has signed a strategic contract with the government defining its key issues and operational projects, intended to accompany the evolution of French industry. The contracts are thus structured around major public policy issues for industry: ecological transition, innovation and digitalisation, sovereignty and competitiveness, development of skills and attractiveness of industry. There are two strategic industry committees in the energy sector: the strategic committee for the nuclear industry and the strategic committee for new energy systems. They involve the trade union federations of the branches concerned and the latter are signatories to the two sector contracts alongside the State and company representatives. These contracts address the issues of attractiveness and the development of jobs and skills, and in both sectors, they are at the origin of the EDECs carried out. This is therefore another forum for tripartite dialogue. However, some of our interviews suggest that, globally, employment and skills issues are given little attention in the frame of the National Industry Council.

- *The territorial level*

The need to deploy initiatives to organise the ecological transition, including the energy transition, at territorial level is clear. For this reason, territorial tools have multiplied over time involving various territorial authorities, including the largest, namely the regions. Thus, at the local level in France, we find:

- The regional plan for planning, sustainable development and territorial equality (SRADDET).
- The Regional Climate, Air and Energy Plan (SRCAE).
- The territorial climate-air-energy plan (PCAET)
- Ecological transition contracts: These are contracts between the State and local authorities to accompany and support the ecological transformation of territories in an innovative approach. Some of them are directly related to the energy transition in certain territories.

All of these tools are evidence of dialogue at the territorial level. However, they do not seem to involve the social partners, or at least the trade unions. Beyond, one might also find other

⁴⁹ The National Industry Council (CNI) is a tool for France's industrial strategy. It sheds light on and advises the public authorities on the challenges facing industry in France, in particular on the ecological and digital transition, reindustrialisation and the country's resilience

territorial tools, which, unlike the first focused on the ecological transition, are instruments for a territorial **social** dialogue. There are thus:

- Regional structures to represent very small enterprises and their employees, where there are no social dialogue bodies: there are thus regional interprofessional joint commissions (CPRI). These structures have the task of providing employees and employers with all the information, advice and opinions they need on the legal provisions or agreements applicable to them and specific to them. The Ministry of Labour presents these commissions as a response to a feeling of isolation often expressed by employers in the face of a legal and economic environment perceived as complex. The members of the CPRI (including trade union representatives) must therefore be competent in issues specific to companies with fewer than 11 employees and their employees, particularly in the areas of employment, training, forward-looking management of jobs and skills (GPEC), working conditions, occupational health, professional equality, part-time work, etc.. This type of body could potentially be interesting given that the energy sector also includes small companies. However, we do not have any precise information attesting to a real role for these committees on these subjects (impacts on employment and training of the energy transition).

- Employment basin committees: The employment basin committees (CBE) are French bodies for extended social dialogue. Created in the 1980s, under the name of "local employment committees", they are defined by law as *"local bodies for the coordination of social dialogue, consultation and action, the aim of which is to contribute to the improvement of the local employment situation and local development of the territories"*. Generally constituted under an associative status, on the initiative of elected representatives and local social and economic players, their composition is at least quadripartite: a college of local elected representatives; a college of business representatives; a college of employee trade unions; a college of the associative sector and the social and solidarity economy. Some of these committees contribute to the forward-looking management of jobs and skills at territorial level. However, we do not yet have more precise information directly related to our subject. But here again, we can see that tools exist for territorial social dialogue.

Furthermore, as already mentioned⁵⁰, there are examples of territorial dialogue in territories affected by industrial reconversions linked to the energy transition. However, the role actually played or not by the trade unions in this context is not well-documented in the current state of our work.

It seems to us, therefore, that we can observe, at least provisionally, that territorial social dialogue on the energy transition could be strengthened, perhaps by mobilising all or part of the many existing tools. This observation echoes that of Mrs Parisot's report, which recommended in 2019 that *"regions and large local authorities should be encouraged to monitor very regularly, in collaboration with employers' and employees' organisations, the local impacts of the Energy Transition in order to put in place, as far upstream as possible, the best instruments for successful transitions"*.

- ***The company level: the classic problem of industrial restructuring?***

The impact of the energy transition on employment and working conditions undoubtedly

⁵⁰ See above section 3.4.4

implies an interest in social dialogue at company level. It is indeed precisely at this level that the changes are likely to take place first. The examples of restructuring of industrial sites discussed during our interviews highlight the fundamental role played by the large companies concerned in supporting the job cuts. These companies, such as EDF and Total Energies, have experience in managing restructuring, i.e. they have significant systems and resources to support their employees. As a result, the support offered to affected employees is considered satisfactory in the context of our interviews: mobilisation of support measures for voluntary mobility, redeployment within the group, exclusion of imposed measures such as redundancies, etc. However, this capacity of large companies to mitigate the negative impacts of restructuring is not specific to the energy sector and has long been found in other sectors in France. In this respect, such responsible management of restructuring is important but not innovative.

In this context, we are therefore limiting ourselves to setting out avenues for questioning and investigation.

Firstly, it is clear that large companies faced with the planned abandonment of fossil fuels affecting the core of their traditional activity (oil for example) have already invested in the new energy sector (renewable, green, etc.). According to some trade unions, these restructurings are leading to the development of "multi-energy" groups (instead of an activity initially focused on a single energy source). This diversification leads to reorganisations marked in particular by the constitution of subsidiaries specialising in renewable energies. Ultimately, this can lead, given the fragmentation of the collective agreements applicable in the energy sector, to groups 'piling up' within them a multiplicity of different branch collective agreements and therefore a multiplicity of differentiated social statuses for workers within the same group. This situation motivates the CGT's demands for an extension of the specific regulatory employment status of the electricity and gas industries (IEG status).

This observation leads to the identification of a possible obstacle to the professional mobility of workers in the context of the reconversions required by the energy transition. This is clearly pointed out by the case study on the coal industry in France already cited with regard to the mobility of coal power plant employees⁵¹: *"Coal workers are attached to the electricity and gas industries and therefore benefit from the 'national status of IEG staff'. This status allows them to pay much less for electricity, an advantage known as the 'agent tariff', and to benefit from a special pension scheme⁵². Other industries (e.g. the oil industry) also offer benefits to their employees through their collective agreement: for the retraining to be satisfactory, it is necessary to be able to offer quality alternative jobs. And the quality of a job goes far beyond the sole criterion of pay"*.

This clearly raises the problem of creating inter-branch or inter-sector bridges (for example, from coal to wind power), via social dialogue, to facilitate the mobility and retraining of affected workers. However, the problem does not necessarily lie at the level of a single company and involves other levels of dialogue (notably territorial).

Beyond these considerations, collective agreements on forward-looking management of jobs

⁵¹ C.Duriez, J. Hallak, Relever les défis des reconversions, le cas du charbon français, Réseau Action Climat et Institut Veblen, 2022

⁵² This specific pension scheme is to disappear in a near future following the recent reform of the French pension system

and skills can be found in companies, which at least implicitly take into account the context of the energy transition. This does not seem to us to be innovative in itself insofar as the Labour Code requires such collective bargaining in companies with more than 300 employees⁵³. Moreover, the practical effectiveness of this type of agreement in organising employees' career paths is not at all certain, if we are to believe the many studies that have been carried out over the years.

This leaves the problem of site closures, or more precisely of energy production plants. We have already mentioned this type of restructuring above in the case of coal-fired power stations or a nuclear power station. Here we face *a priori* with unfortunate but classic situations of industrial restructuring (site closures). In these situations, the legislative framework is very extensive, particularly in that it regulates in detail the procedures for collective redundancies on economic grounds. This may include the implementation of a social plan (to help redeploy employees affected by a job loss) but always implies compliance with social dialogue procedures (information and consultation of staff representatives, collective bargaining). So there is nothing original here either, except for the question already mentioned of the organisation of bridges that could effectively make it easier the redeployment of employees.

However, one can note that collective conflicts have recently arisen in these situations. This was the case in 2021, following the closure of the coal-fired unit at the Gardanne power station (southern France) by the company Gazel Energies. The conflict between the management and the trade unions related precisely to the concrete possibilities of redeploying **all** the employees of the power station to alternative renewable energy production activities supported by the management.

More generally, a specific feature of industrial restructuring in the context of the energy transition is that these closures are the consequence, not only of the choice made by companies, but also of decisions taken by the public authorities. This explains why the law on energy and the climate of 8 November 2019 provides for specific measures to support the employees of the power stations and ports affected by the cessation of coal traffic in the power stations: financial security measures, in addition to those provided for by the employers; development of skills and access to training, to enable employees to benefit from adaptation or retraining actions according to their needs; the implementation of an individual support unit for employees. The State and the employers pay for these additional measures, compared to ordinary law, jointly.

⁵³ This collective bargaining process is compulsory every three years for companies with at least 300 employees or belonging to a group with at least 300 employees. Negotiations may be conducted at company or group level. See article L2242-2 of the Labour Code

ANNEX - QUALITATIVE SURVEY

Energy for a just and green recovery deal: the role of the industrial relations in the energy sector for a resilient Europe

Introduction

The purpose of this appendix is to supplement the overview of the French situation carried out during the first phase of the REJEnerAXion project based on a literature review.

It consists of a short summary of interviews conducted with a variety of stakeholders involved in the energy transition and its social consequences (employment, skills, working conditions, etc.).

The project coordinator defined the categories of stakeholders targeted. In relation to the issue at hand, the aim was to approach a wide range of stakeholders, including especially:

- Representatives of employers' organisations
- Trade union representatives
- Experts
- Representatives of non-governmental organisations involved in environmental protection.

In accordance with the guidelines defined by the project co-ordinators, the survey was also to focus primarily on:

- Sectors involved in the production, extraction and distribution of energy produced from fossil fuels: oil industry, gas industry, coal industry.
- A predominantly national approach to the issues addressed.

In this context, we chose to target as a priority the professional organisations and trade unions active in the targeted sectors. In the case of France, this has mainly led to a focus on the oil and gas industries, as coal production and mining have already been virtually abandoned in the French context⁵⁴. The identification of the organisations to be interviewed was based on an understanding of the various professional branches that make up the energy sector in France. The starting point for the research was therefore the oil industry and the electricity and gas industries. Employers' organisations and representative trade unions in these sectors were therefore targeted. However, the deadlines set for the interviews meant that it was not possible to meet with all the organisations concerned. For this reason, we were finally able to interview.

➤ *Employers' organisations*

- UFIP Energies et Mobilités: employers' organisation representative of the oil industry (interview April 2023)
- France Gaz: trade association for the French gas industry (natural gas, renewable and low-carbon gases, liquid gases and hydrogen - interview May 2023)

➤ *Trade union organisations*

- Fédération Chimie Energie CFDT: representative trade union federation covering both the oil industry and the electricity and gas industries (interview April 2023)
- CFE CGC petroleum and new energies union (interview April 2023)
- The FO Energies et Mines federation, covering in particular the electricity and gas industries (interview May 2023)

⁵⁴ Subject to the temporary reopening of coal-fired power stations in 2022 as a result of the energy crisis, see our report for details

- The CFE CGC Energies federation, covering the electricity and gas industries (interview May 2023).

In addition to these interviews with social dialogue players, we also conducted:

- An expert interview with the Economics and Foresight department of ADEME (*Agence de l'environnement et de la maîtrise des énergies* - interview April 2023)

- An interview with the Climate Action Network's (Réseau Action Climat⁵⁵) programme coordinator (April 2023).

In total, we had the opportunity to carry out 8 interviews during a period marked in France by strong social mobilisation around pension reform. The limited number of interviews conducted means that this summary is not representative of all the players involved in the issues addressed⁵⁶.

All the interviews were conducted remotely over a period of 1.5 to 2.5 hours per interview. Three main themes were addressed in the interviews:

- Changes in jobs and skills brought about by the energy transition
- Professional retraining and the local impact of restructuring processes linked to the energy transition
- Social dialogue processes mobilised in support of the energy transition.

The following is a summary of what we learned from our interviews in those three different areas. A conclusive part attempts to point out challenges linked to a “just transition” identified during our interviews

We would like to thank all the people we interviewed for the time they accepted to dedicate to our project!

1. Evolution of employment and skills

The context in which jobs and skills are changing in the energy sector needs to be clarified. In the sectors that have traditionally produced and used fossil fuels (oil and gas in our case), our interviews show that all the players⁵⁷ interviewed recognise and accept the need for a green transition. This justifies research and development into alternatives to fossil fuels. The oil industry is supporting and working on the development of oil substitutes: low-carbon liquid fuels and synthetic fuels. As for the gas industry, the production of green gas (particularly through methanisation) and hydrogen is being developed. Support for these innovations means that these industries are likely to change, but not to disappear from the French landscape. The players interviewed reject the idea of a future French energy mix based solely on the production and consumption of electricity. What's more, some of them point to the uncertainties surrounding the rate at which fossil fuels will be phased out: the same applies to the actual reduction in consumption of finished petroleum products in France, given the still very limited deployment of electric vehicles. These factors underline the uncertainty felt by some players.

⁵⁵ The “Réseau Action Climat” brings together 27 national associations and 10 local associations active in the fight against climate change. It is a member of the Climate Action Network Europe.

⁵⁶ Such an ambition would have meant conducting a very large number of interviews, which was not possible given the project's timetable.

⁵⁷ Employers' organisations and trade unions

This uncertainty does not make it any easier to anticipate the trade-offs to be made in terms of changes in the volume of jobs in industries undergoing change.

For several years now, the major oil and gas companies have been engaged in a process of diversifying their activities. In short, the aim is to develop new activities that are not limited to traditional fossil fuels: biofuels and green gas on the one hand, but also, and in particular, the production and distribution of electricity through the development of renewable energies. Because of this diversification, some of the companies' activities are extending beyond the boundaries of their original professional sector /branch : these are multi-energy companies that are developing, so that the scope within which job changes and professional mobility can be addressed is widening in line with this diversification.

Against this general backdrop, it is difficult to get an overall picture of the development of jobs and skills linked to the energy transition. The 2015 law on energy transition for green growth provided for the establishment of a national programming plan for jobs and skills linked to the energy transition. In the end, however, it was only a preparatory study for such a plan that was published, rather than a programme that would provide practical support for forward-looking management of jobs and skills. For some of the people we spoke to, this failure illustrates the historic difficulty, in the French context, of organising comprehensive support for the development of jobs and skills in the context of the ecological transition⁵⁸. We can assume that the absence of such a tool does not facilitate the mobilisation of players at different levels (economic sectors, professional branches, territories, companies) to identify and provide concrete support for changes in jobs and skills linked to the energy transition.

However, one should note that analyses of changes in jobs and skills have recently been developed at different levels and in different areas. Three of such studies were mentioned during our interviews:

- The "Impact de la transition écologique sur les métiers et les compétences de l'industrie" study (June 2022). Piloted by the OPCO2I, it covers 32 industrial branches, including the oil, electricity and gas industries, as part of an EDEC⁵⁹.

- The "prospective study of jobs and skills in the gas, heat and associated energy solutions sector up to 2030" (April 2022). This study, led by France Gaz, is also part of an EDEC.

- The "Skills and careers in low-carbon energies" study (COMED - December 2022). Led by EVOLEN⁶⁰, this study benefited from public financial support but is not part of an EDEC.

In the light of these studies, it is first interesting to note that they all adopt an approach covering a plurality of professional sectors/branches. This shows that the actors perceive the need to understand the development of jobs and skills in a broader scope than that of the energy sector's professional branches. In the case of the OPCO2I study, it resolutely adopts a cross-industry approach (between 32 different industrial branches). The study devoted to the gas industry, on the other hand, adopts a broader definition of the gas value chain: production, transport and distribution, but also all energy services, heating networks and the installation and maintenance of equipment. These studies therefore include analyses that could not be carried out by the oil

⁵⁸ See our interview with ADEME, April 2023

⁵⁹ On this concept, see our baseline report p. 16

⁶⁰ EVOLEN is an association of companies from the oil, oil-related services and gas-related services sectors.

industries or the electricity and gas industries alone. Defining the scope of the industries covered by such studies is therefore in itself an important choice to be made in order to establish a relevant framework for assessing changes in employment and skills. There is always a risk that the scope adopted will be too broad or, on the contrary, too narrow, limiting the relevance of this type of analysis so that it can be applied in practical terms (for example in companies).

Overall, these studies provide a mapping of jobs and skills and a prospective analysis of their development (from both a quantitative and qualitative perspective) within the scope they define. All of them attempt to identify the needs in terms of jobs and skills generated by the energy transition, and to deduce recommendations for the players in the sector: changes in skills by job/occupation⁶¹, forecasting recruitment needs (jobs in short supply). These studies can lead to concrete initiatives. For example, to ensure the attractiveness of the gas, heat and associated energy solutions sector, the study led to the creation of an "energy skills" internet portal presenting the sector's skills and job vacancies. The study also led to the launch of an experiment called the "road to gas". The aim of this scheme is "to help people with no qualifications to build their career plans by discovering the jobs in the gas, heat and associated energy solutions industry"⁶².

With regard to the risks of job losses, some of the initiatives mentioned above make it possible to identify occupations that are in decline and therefore at risk of job losses. For example, the OPCO2I study identifies, for the oil industry, that "jobs in the upstream oil industry are likely to experience a decline in numbers: geophysicists and geoscience engineers, for example, are destined to decline as oil production ceases. However, these professions will need to be maintained in companies to manage the deposits currently being exploited. Although certain activities are set to decline sharply in the long term, the associated skills will not become obsolete. The context in which the skill is applied will change, but the core business activities will change little or not at all". For its part, the "gas" EDEC mentions that "four occupations could see a downward trend, mainly in connection with the regulatory framework and digital technology: specialised heating oil technicians, assistants (sales assistants, etc.), customer service and logistics agents". In this respect, one should note that the energy transition is only partly to blame for the changes mentioned⁶³.

Overall, the assessments offered by these studies concerning the risks of job losses may seem limited or imprecise. Based on our interviews, these limitations can be attributed to the fact that some significant uncertainties affecting the future of traditional fossil fuel industries remain: capacity to strongly develop alternative green solutions (biogas, hydrogen, biofuels...), place of those alternatives in the French new energy and climate strategy defined by the Government (work in progress), etc. In this context, uncertainties affecting possible job losses are strong and depend on a number of factors that are difficult to assess. An example of these uncertainties was given to us during our interviews. One of the measures the government currently considers is the gradual phasing out of gas-fired boilers in order to promote the decarbonisation of buildings, from 2026. On this project, a trade union official told us: "with these projects, GRDF⁶⁴

⁶¹ In all these studies, given that the scope covers a diversity of professional branches, it was necessary to construct a reference framework of occupations common to the various branches and companies targeted.

⁶² From June to December 2022, 12 trainees took part in a programme combining training and work placements in Lyon-based companies at all stages of the industry.

⁶³ In this example, it is the ban on the installation of new oil-fired boilers from July 2022 that has led to the identification of a risk to the employment of specialised oil-fired technicians.

⁶⁴ **Gaz Réseau Distribution France (GRDF)** is the French gas distribution company founded on 1 January 2008.

is going to find itself with thousands of jobs on its hands - jobs that work on gas connections - where are they going?"

In this context, we believe that three specific questions can be asked:

- *Will all workers from fossil fuel industries be able to shift to green jobs in their company / group?*

This question makes sense in the light of the diversification of the activities of major companies in the traditional oil and gas industries. This involves substituting fossil fuels with green energy sources. In this context, our interviews highlight, for example, that this reorientation is leading to the replacement of large infrastructures with a multitude of small infrastructures scattered across the country (for example, methanisation units for the production of bio-gas). While this development is creating direct and indirect jobs locally, *"these are only a few jobs: 10 employees at most in a methanisation unit. So it's difficult to move from massive production units to this without losing jobs"*.

The same type of difference was reported in the oil industry: a bio-refinery produces less fuel than a conventional refinery and therefore employs fewer people.

In addition, several of our interviews also highlighted the difficulty for at least some categories of employees within large groups⁶⁵ to move into renewable energy-related activities. This raises the question of whether some employees will be left by the wayside because of the energy transition.

- *Can we identify cross-functional jobs and skills useful in other companies / sub sectors in the energy sector?*

The question raised here is that of the transferability of the skills of employees, whose jobs are at threat in their company of origin, to other companies or other growth sectors because of the energy transition.

The studies mentioned above and our interviews address this issue. For example, the COMED study, dedicated to jobs in the energy transition, mentions *"all the opinions converge in considering that most of the traditional skills of the oil and gas industry can be transposed to almost all the professions involved in the energy transition, with a fairly simple upgrade. Whether in the management of major industrial projects, expertise in technological advances, mechanical engineering or capacity"*. A common example is that of the offshore oil platform design engineer who could design offshore wind turbine projects.

In a comparable perspective, the employment forecasts in the gas sector refers to the possibilities to build up bridges between different sectors, especially for jobs identified as being at risk: heating oil technician / sales assistant /

Finally, some specific occupations refer to skills needed in all energy sectors and even beyond. These jobs therefore often appear to be in short supply, generating competition between a variety of economic sectors and companies. Maintenance technicians and welders are mentioned several times in this context.

In the light of these factors, it seems clear that certain occupations and skills can easily enable employees to move from one company to another or from one sector to another. However, not all occupations are in this favourable situation. The question that remains is how to support employees' professional development, in particular by identifying and organising gateways from

⁶⁵ Especially employees with a high job tenure

one profession to another. The EDEC for the gas industry clearly mentions this need. It remains to be determined at what level(s) (company, territory, country) and within what perimeter (a more or less broad economic sector or several distinct economic sectors from an inter-professional perspective) these gateways should and could be built.

- *What are the obstacles workers face to shift from one job/company/ sector to another?*

This question is significant in order to facilitate workers mobility in light of the energy transition. Several representative unions (representing workers under the gas and electricity industries status) defend the idea of a same status for all workers of the energy industry to harmonise competitions between large firms and to facilitate professional redeployment (CFDT, FO, CGT....)

2. Professional retraining and the local impact of restructuring processes linked to the energy transition

It is interesting to combine an examination of the occupational mobility of workers affected by the energy transition with another examination of the territorial impact of the restructuring generated by the energy transition. This may make it possible to consider the extent to which job losses in a given area may or may not be offset by the creation of new jobs in that same area⁶⁶.

From this perspective, our interviews confirm the territorial impact of industrial site closures or reconversions already mentioned in our preliminary report. In this respect, France already has experience of the abandonment of coal mines and, more recently, of the government's decision to close coal-fired power stations (scheduled in 2019). But this type of situation also applies to nuclear power plants, which have a limited lifespan. In June 2020, France's oldest nuclear power station in the east of the country (Fessenheim) was closed.

In the light of these situations, our interviews highlight several important points:

- The need for a clear, stable industrial strategy ahead of actual closures: experience with the closure of coal-fired power stations highlights the need to communicate clearly about the closure and when it will occur. Only then can the various players involved (companies, employees, local authorities, outplacement operators) mobilise early enough to provide effective support for employees. In other words, "stop and go" is to be avoided. This also relates to the Government strategy.

- There is a time lag between the need to redeploy affected employees quickly enough and the need to reconvert the region. It often takes a long time for industrial redevelopment opportunities to materialise, so employees do not see them as concrete redeployment solutions. There is therefore a risk that employees will no longer be there when local redeployment opportunities become available. From this point of view, it is the capacity of local public players (local authorities) to provide a precise vision of recruitment needs in the area as well as the bridges open to employees affected by site closures that is called into question. In this respect, shortcomings are clearly identifiable from our interviews. This explains why the Climate Action

⁶⁶ In order to avoid the economic and social decline of the affected area

Network and ADEME recently set up an innovative tool for local authorities called **TETE** (**Transition Ecologique, Territoires et Emplois**). The aim of this tool is to enable local authorities to calculate the employment impact⁶⁷ of their "energy and climate" strategies⁶⁸, so that they can then support the creation and elimination of jobs in their territory

- The examples of restructuring of industrial sites discussed during the interviews⁶⁹ highlight the fundamental role played by the large companies concerned in supporting the job cuts. These companies, such as EDF and Total Energies, have experience in managing restructuring, i.e. they have significant systems and resources to support their employees. As a result, the support offered to affected employees is considered satisfactory in the context of our interviews: mobilisation of support measures for voluntary mobility, redeployment within the group, exclusion of imposed measures such as redundancies, etc. This aspect is not specific to the energy sector and has long been found in other sectors in France. The exercise of this social responsibility by major groups often leads them to enter into dialogue with local public players, but it does not necessarily lead to jobs being maintained in the area affected. It is therefore not part of a territorial management of restructuring, which may seem necessary in order to address all the impacts of the restructuring of a major industrial site (indirect jobs, local businesses and economic activity of the area as a whole).

- The actual conversion of the affected areas to new activities varies greatly depending on the areas under consideration. In any case, as we have already emphasised, it takes longer than the closure of a site and may be subject to a large number of uncertainties. This argues again in favour of a form of territorial anticipation of the impacts of the energy transition.

3. Dialogue in support to employment impacts of the energy transition?

Upstream of the formal social dialogue, our interviews have highlighted the difficulties encountered in developing, at a strategic level (national and regional), concrete anticipation and support for the employment and skills challenges associated with the ecological transition in general and the energy transition in particular. From this point of view, our contacts at ADEME and the Climate Action Network (RAC) regret the failure to date of the jobs and skills programming plan provided for in the 2015 law. The work on energy and climate programming at national and regional level does not address the issue of job losses associated with the gradual abandonment of fossil fuels, and does not provide any tools for professional transition between the old and new energy sectors. According to our interviews, this situation is partly due, in practice, to the silo way in which various central administrations (Ministries) responsible for the different issues raised operate: the ecological transition comes under the Ministry of Ecological Transition, the Ministry of the Economy focuses on the development of new energy sectors and employment issues come under the Ministry of Labour. The diversity of the public players involved does not therefore seem to make it any easier to anticipate and support professional transitions. In addition, there are a large number of consultative bodies under the authority of each ministry, in particular the National Industry Council (under the authority of the Ministry

⁶⁷ The number of direct and indirect jobs created in various industries, including renewable energy.

⁶⁸ See our baseline report and the tools mentioned, p.32

⁶⁹ Fessenheim nuclear power plant, conversion of the La Mède refinery into a bio-refinery, etc.

of the Economy) and the National Council for Ecological Transition (under the authority of the Ministry for Ecological Transition). Although trade unions and NGOs are represented on these bodies⁷⁰, employment and skills issues are given very little attention. It would therefore appear that there is a problem of coordination between a variety of public players, leading to a failure to consider enough the employment and skills impacts of the green transition. It is no doubt partly for this reason that a General Secretariat for Ecological Planning, placed under the authority of the Prime Minister, was set up in 2022.

According to the RAC, this difficulty in linking different perspectives (economy, environment and employment) in concrete terms is repeated at regional level, where the various existing local ecological planning tools⁷¹ are not linked to economic development tools⁷² and therefore do not make it possible to identify where employment problems may arise.

In this context, it appears that the links between the ecological transition and changes in employment are not sufficiently explored and equipped to date. This is what has long justified ADEME's initiatives and experiments to strengthen collaboration between environmental and employment actors⁷³. The aim is to build shared scenarios for the future, between different players and at different levels, which can then lead to concrete actions that benefit both the environment and employment. These objectives are reflected in ADEME's Roadmap for Employment 2021-2023. Against this backdrop, a number of interesting regional experiments have been launched on the issue of energy-efficient renovation of buildings: the aim is to set up local forums for forward-looking dialogue involving a range of stakeholders. This method, known as *"Support for forward-looking dialogue"*, has been tested in the Cambrésis region (northern France), with a view to spreading it to other employment areas. It has 3 objectives:

- Build a clear vision, shared by all stakeholders, of the challenges and prospects for energy-efficient home renovation in the region
- Conduct a detailed analysis of the jobs and skills required to meet the demands of these markets.
- And, based on this vision and these analyses, to draw up an action plan.

This is a good example of a method aimed at co-constructing, with a wide range of stakeholders, a local mobilisation strategy for the energy transition in a given sector and region.

This type of approach is based on a general diagnosis that informs ADEME's positioning and actions: *"All too often, social dialogue remains confined to professional branches, whereas environmental issues are resolutely cross-branch, cutting across all economic activities"*.

This observation is echoed in the sectoral initiatives already mentioned, aimed at organising the anticipation of employment and skills needs at the level of economic sectors⁷⁴. In this way, they enable social dialogue to transcend the boundaries of numerous, highly fragmented professional branches. This approach is undoubtedly a better way of dealing with an energy transformation that involves a diversity of professional sectors.

⁷⁰ With regard to the National Council for Ecological Transition for the environmental NGOs

⁷¹ See our baseline report p.32

⁷² In particular, regional economic development plans (SRDEII)

⁷³ In all their diversity: public employment service, training providers, etc.

⁷⁴ See section 1, for example in the gas sector

Apart from these crosscutting initiatives, industry-level (branch) social dialogue in the oil and gas industries does not seem to be directly addressing the employment impacts of the energy transition. According to our interviews, these issues are much more a matter for companies, and in particular the large companies in these sectors, which are taking direct responsibility for these issues. This may be the result of a "political" choice made by the companies in a given sector⁷⁵. It may also result from the diversification of large companies in the energy sector: their activities have expanded beyond the scope of the economic activities covered by their original professional branch (the electricity and gas industries branch or the oil industries branch), so that the latter is no longer in line with all their activities.

Anticipating and supporting restructuring linked to the energy transition is therefore primarily a matter for the company level. On this point, the abandonment of certain activities and/or sites may give rise to significant social support on the part of large companies⁷⁶. Anticipation, on the other hand, seems to be largely lacking. In other words, for all our trade union contacts, problems are dealt with when they arise and not before, for example, the announcement of a site closure. We were unable to obtain any further details on this point. It probably refers to the development in companies and groups of "job and career management" (GEPP) approaches⁷⁷. The question then is whether these approaches, where they exist, are effective in anticipating companies' medium- or long-term business and skills requirements, while supporting employees' career development.

It therefore seems that the energy transition is likely to shake up the traditional perimeters of social dialogue and highlights the need for cross-sectoral approaches to its impact on employment and skills. It may therefore call for the development of a multi-stakeholder dialogue at different levels (national, regional, local employment areas) in a cross-sectoral perspective (a given economic sector and its various components, a territory as a whole, etc.). The subject is undoubtedly complex, particularly as the major energy industries (oil, gas and electricity) are long established and highly structured. In addition, and logically, our interviews with trade union representatives show that the negative impact on employment of the abandonment of fossil fuels is in itself a brake on the green transition. However, a number of initiatives mentioned in our interviews⁷⁸ show that employee representatives and their organisations are increasingly taking on board the challenges of the energy transition. Overall, then, a concerted and coordinated approach to the environmental AND social challenges of the energy transition at different levels seems likely to continue to develop in the future.

4. Main challenges for a just transition?

In respect to our interviews, we try to point out here some elements related to ways to support

⁷⁵Example of the oil industry branch

⁷⁶ See section 2. above

⁷⁷ This collective bargaining process is compulsory every three years for companies with at least 300 employees or belonging to a group with at least 300 employees. Negotiations may be conducted at company or group level. See article L2242-2 of the Labour Code

⁷⁸ At the level of a trade union federation, of European works councils of major energy companies or informal alliances between NGOs and trade unions ([Pacte du Pouvoir de Vivre](#)).

linkage between environmental transition and employment and work issues. We talk about challenges rather than *barriers vs drivers* as the points mentioned can be seen both as barriers (currently) and as drivers (in a near future)

Overall, the challenges we mention call into question the ability to sufficiently anticipate and support the job losses and professional transition needs likely to result from the energy transition.

- *Political challenges*

Despite acceptance of the need for an energy transition by the actors in the sectors undergoing transition, both the gas and oil sectors are arguing for the maintain of a sufficiently broad French energy mix, i.e. one that leaves a place that is deemed essential for the traditional gas and oil industries. An example of this issue is the current debate on the possible ban on gas boilers in the near future. Similarly, the precise timetable for phasing out fossil fuels is open to debate, for example as regards the fuels used for light vehicles (cars) in a context of slow electrification of the French car fleet. A common diagnosis between all the players involved in the transition still needs to be perfected. And such a common diagnosis is not self-evident, as the interests of the various players are divergent⁷⁹.

- *Technical challenges*

The transition of the gas and oil industries relies on the development of new products and technologies, for example biogas, biofuels, CO2 capture and storage, etc. The fact remains that the latter must be able to develop strongly to support the reconversion of these industries, which remains a challenge to this day.

- *Social challenges*

We retain two points here:

- A forward-looking and shared vision of the quantitative and qualitative evolution of jobs in the context of the energy transition remains to be developed or reinforced at several levels. The challenge is in particular to be able to meet the needs for jobs and skills that are expected to grow, but also, at the same time, to precisely identify the risks of job loss in order to be able to support them. This is certainly key to support the social acceptability of the energy transition by the employees themselves.
- The professional mobility of workers in traditional industries towards green activities or industries: employees in the electricity and gas industries (IEG) or the oil industry

⁷⁹ Maintaining traditional industries and their jobs on the one hand, promoting a real green transition on the other. For example, the development of capacities to capture and store CO2 by the oil industries to achieve carbon neutrality is not seen as a green measure by environmental associations.

benefit from specific social statuses often perceived as advantageous and protective: the national status of IEG or the application of the collective agreement of the petroleum industries. As a result, redeployment to other jobs may be hampered by the risk of losing this advantageous status. This therefore effectively reduces the possibilities of inter-branch or inter-sector bridges. In this perspective, it should be noted that, in various forms, several trade union organisations in the energy sector (CGT, FO, CFDT) plead for a single and sufficiently protective social status for all employees in the energy sector. This social dimension linked to the status of workers must in any case be taken into account to build satisfactory retraining (redeployment in quality jobs), including within the same group⁸⁰

- Economic challenges

The development of concerted approaches to anticipate and support the employment impacts of the energy transition, at national and local level, requires the commitment of companies in these processes. However, energy companies, and in particular the largest ones, are today in competition, including for access to the human resources they need. This competitive situation probably does not facilitate concerted anticipation of restructuring or the establishment of bridges between companies that may be necessary.

⁸⁰ For example, not all EDF group employees are subject to the IEG status. This is particularly the case for employees working in renewable energies within the group.

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