

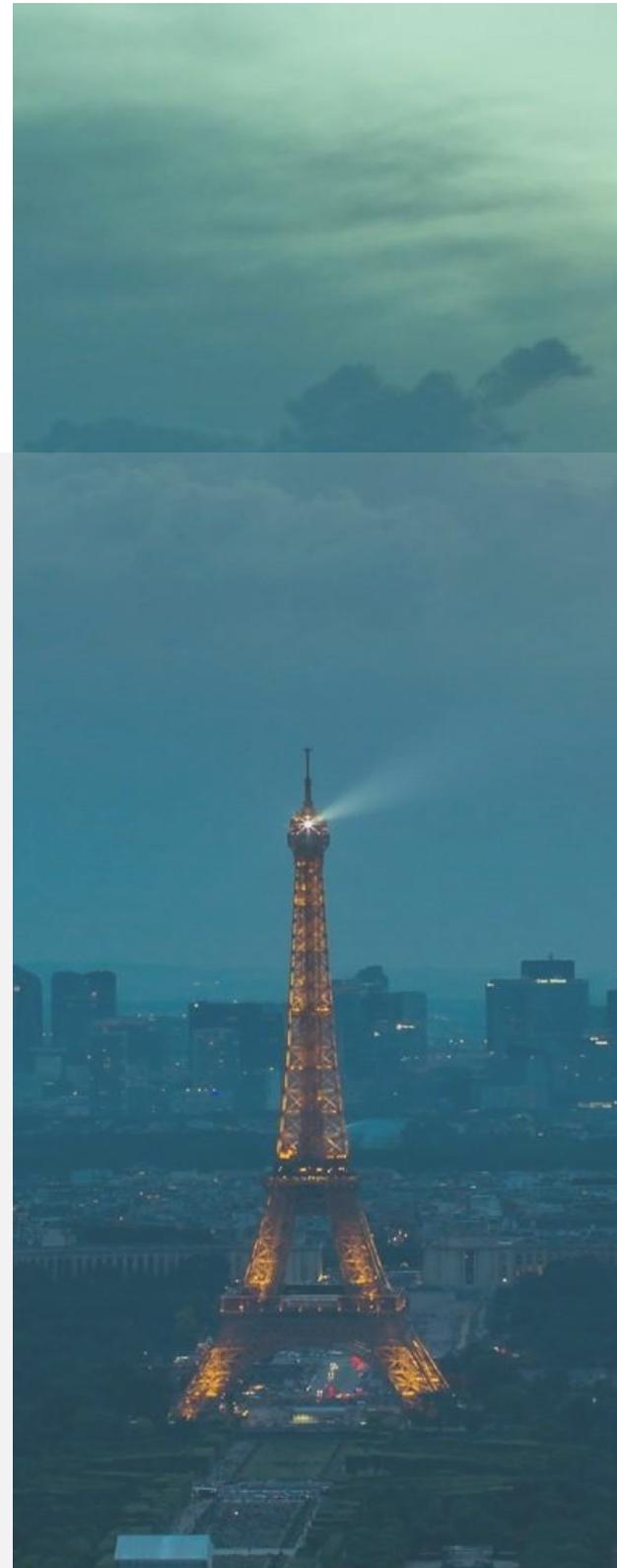
PANORAMA OF RE PRODUCERS LISTED IN PARIS

10 bets on renewable

Awareness of the challenge of global warming, political objectives and the explosion in fossil fuel prices are fuelling a strong interest in renewable energies (RE). In France alone, the Pluriannual Energy Programme, adopted in 2020, plans to double renewable electricity production capacity by 2028 to achieve carbon neutrality by 2050. The production of decarbonised electricity and heat, the capture and transformation of methane emissions, and the mass production of green hydrogen are all avenues to be followed to achieve this ambition.

Alongside the large energy companies such as Engie or EDF, gas producers such as Air Liquide and the oil majors, which are investing massively in renewable energy, there are ten smaller listed renewable energy producers in France. They complement the action of the larger ones, often in partnership with them, by bringing innovation, agility and proximity. We have selected: Agripower, Charwood Energy, Groupe OKwind, Haffner Energy, Hydrogène de France, La Française de l'Energie, Lhyfe, Neoen, Voltalia and Waga Energy.

We have chosen to describe their positioning and strategy in order to help investors discern, beyond a buoyant trend, the key success factors specific to each of them. While growth potential is present in all segments, risk profiles vary greatly. Valuations reflect the potential for growth and profitability and are generally high.



This overview of French listed renewable energy producers aims to help investors discern, beyond a mega trend, the key success factors specific to each of them. Some valuations may give rise to fears of a bubble fuelled by the desire to participate in the energy transition "at all costs", and while the growth potential is present in all segments, the risk profiles vary greatly.

Summary conclusion

As a signatory to the Paris Agreement in 2016 and the European Green Deal in 2018, France is committed to achieving carbon neutrality by 2050. In 2019, the country adopted the Energy-Climate Law. The Multiannual Energy Programme (PPE), adopted by decree on 21 April 2020, provides for a doubling of renewable electricity generation capacity by 2028 as part of the 2050 carbon neutrality objective.

France has a low-carbon electricity mix thanks to its nuclear power plants. The country has however begun its transition to green energy by developing a national low-carbon strategy and a planning framework for energy investments. Government support has enabled RE companies to expand their operations and invest in new and efficient technologies.

We have chosen to describe the positioning and strategy of the 10 listed renewable energy companies, excluding the historical energy companies. With the exception of Neoen and Voltalia, two structured and profitable industrial groups, and also La Française de l'Energie, these are young companies for which we highlight strengths and key success factors. RE valuations are high and favour the own-account producers in terms of turnover multiple. For the youngest companies, the exercise remains theoretical. Investors will have to remain attentive to the coherence between the contracts won, the cost structures and the financing needs and the often very ambitious objectives.

Increased collective awareness of the issue of global warming, political objectives and the explosion in fossil fuel prices are fuelling strong interest in this topic. The need for investors to green their portfolios is also increasing this interest. In this buoyant environment, Albioma, a 76% renewable independent power producer that operates mainly overseas, was the subject of a friendly takeover bid by KKR this summer. Its portfolio includes 14 power plants and an installed capacity of over 1GW. The €1.45bn deal, financed entirely in cash, yielded EV/Sales multiples of 4.1x and EV/EBITDA of 12x.

Table of contents

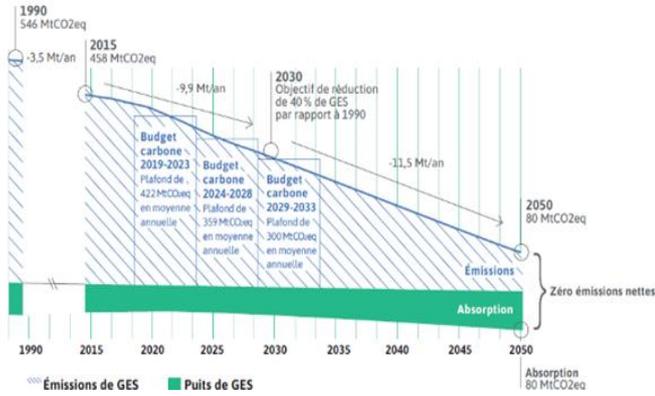
Summary conclusion	2
Renewable energy in France in pictures	5
Objective carbon neutrality!	7
A global issue, national objectives	7
A unique French energy mix	8
Reducing GHG emissions in France and Europe: what are we talking about?	9
Energy prices in France: a political issue	10
Public aid	11
The current feed-in tariffs	12
Carbon pricing: potential opportunities for RE companies	12
ENR sectors in France	14
Wind	15
Photovoltaic	16
Hydrogen	17
Biogas	18
Biomethane	19
Solid biomass	20
Mine gas: a special case of recovered energy	21
A variety of actors	22
High valuations and producer premiums	24
In France, within our universe	24

Internationally	27
Albioma, friendly takeover bid by the American fund KKR	29
Agripower: micro and collective methanisation	30
Charwood Energy: biomass specialist in transformation	32
OKwind Group: individual self-consumption	34
Haffner Energy: hydrogen by thermolysis of biomass	36
Hydrogène de France: a pioneer in hydrogen-electricity	38
La Française de l'Energie: multi-technology producer in short circuits	40
Lhyfe: hydrogen to decarbonise industry and mobility	42
Neoen: French independent leader in renewable energy production	44
Voltaia: the most international	46
Waga Energy: recovery of methane from landfills	48
Risk of conflicts of interest	50
Disclaimer	50



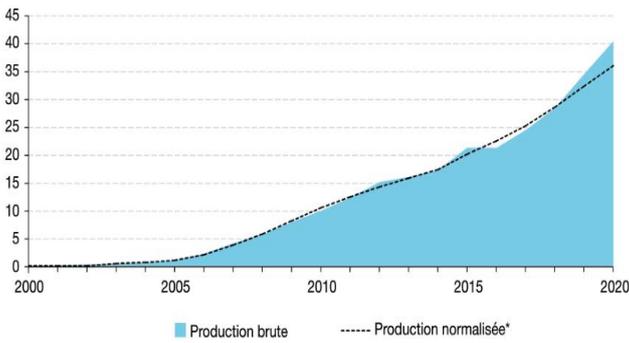
Renewable energy in France in pictures

Chart 1: French GHG reduction targets



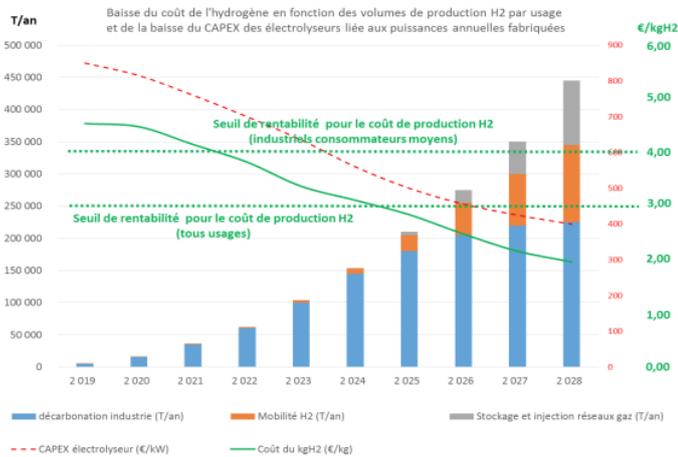
Source: SNBC

Graph 2: Wind power generation in France (TWh)



Source: SDES

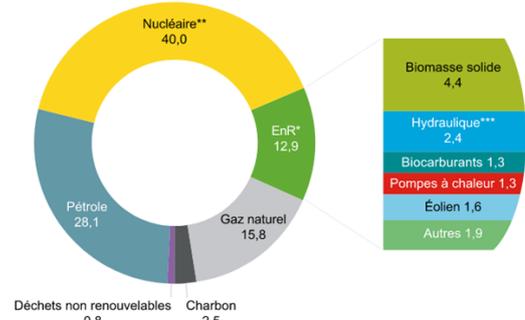
Graph 3: Evolution of hydrogen production costs



Source: CNH

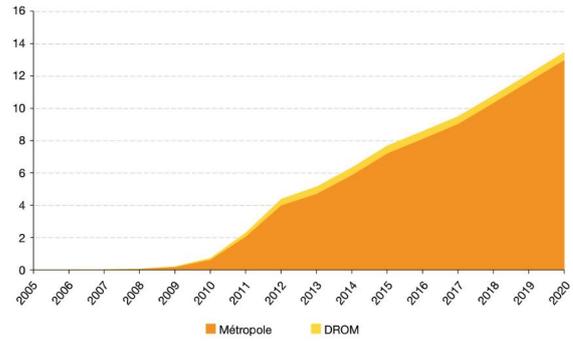
Graph 4: Primary energy consumption in France

TOTAL : 2 571 TWh en 2020 (données non corrigées des variations climatiques)
En % (données non corrigées des variations climatiques)



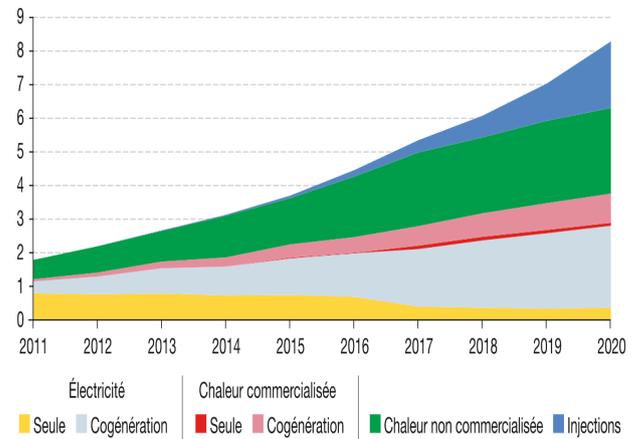
Source: SDES

Graph 5: Photovoltaic electricity production Fr. (TWh)



Source: SDES

Graph 6: Energy production from biogas (TWh)



Source: SDES



Table 1: Energy sources operated by listed players in France

	Biomass	Wind	Solar	Mine gas
Agripower	X			
Charwood Energy	X			
OKwind Group		X		
Haffner Energy	X			
Hydrogène de France			X	
La Française de l'Energie	X		X	X
Lhyfe		X		
Neoen		X	X	
Voltaia *	X	X	X	
Waga Energy	X			

*Voltaia also operates a hydroelectric plant

Sources: Theia Recherche, companies

Table 2: Listed companies in France, growth prospects and valuations

(€m)	Capi°	VE	SALES 21	SALES 24° (1)	CAGR SALES 21-24th	EV/SALES 21	EV/SALES 24th	IPO date	Perf. since IPO (%)
Agripower France	28,7	17,2	8,4	40,0	68%	2,0	0,4	20/11/2019	3,0
Charwood Energy	35,1	34,8	4,6	21,4	67%	7,6	1,6	13/07/2022	-36,4
OKwind Group	102,7	90,0	25,0	80,4	48%	3,6	1,1	08/07/2022	13,5
Haffner Energy	248,9	188,3	0,4	49,5	405%	490,4	3,8	15/02/2022	-26,8
Hydrogène de France	346,2	252,8	0,9	30,7	226%	285,7	8,2	24/06/2021	-21,8
La Française de l'Energie	238,7	263,8	26,2	71,5	40%	10,1	3,7	13/06/2016	82,9
Lhyfe	363,7	220,6	0,2	35,4	464%	1119,8	6,2	23/05/2022	-11,9
Neoen	3 622,4	6 540,6	333,6	633,2	24%	19,6	10,3	17/10/2018	117,4
Voltaia	1 751,1	2 554,4	461,3	597,9	9%	5,5	4,3	08/05/2006	-44,6
Waga Energy	616,3	490,9	12,3	65,5	75%	40,0	7,5	27/10/2021	15,3

(1) Extrapolation based on LT targets announced by the companies for 2025 or 26, Factset consensus for Neoen and Voltaia

Sources: Factset, Theia Recherche, companies

Objective carbon neutrality!

Under the Paris Agreements (2015), France is aiming for carbon neutrality by 2050, which implies a sixfold reduction in its greenhouse gas (GHG) emissions compared to 1990. The collective awareness of the challenge of global warming, the political objectives and the explosion in fossil fuel prices are fuelling strong interest in listed companies in the renewable energy sector, as their proposals can accelerate the path to carbon neutrality.

A global issue, national objectives

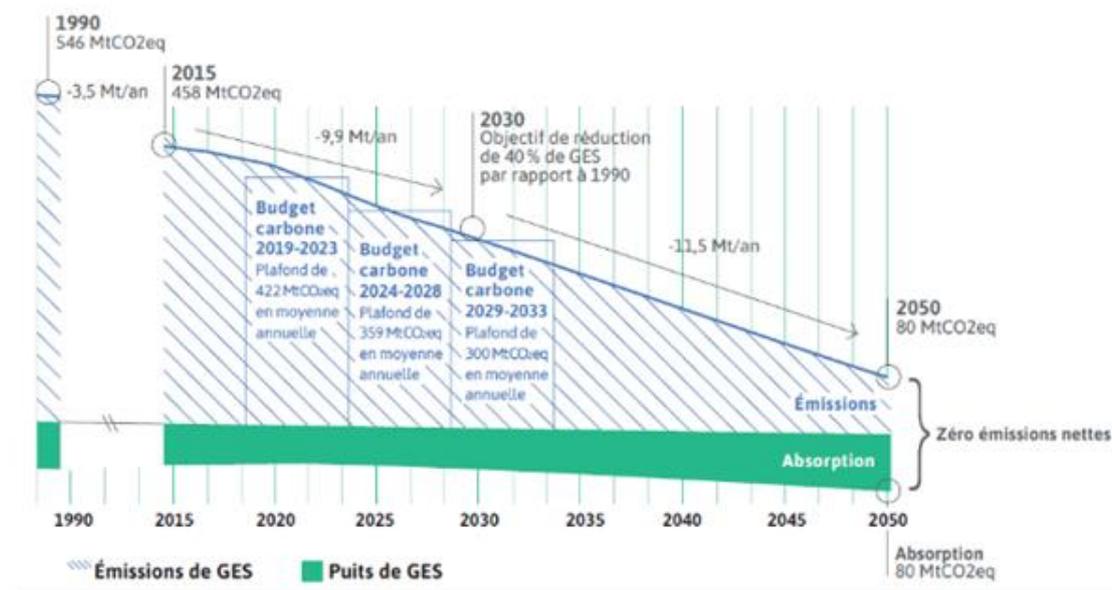
Under the Paris agreements (2015), 192 states committed to deep cuts in global greenhouse gas emissions with the aim of limiting global warming to 2°C this century, while continuing efforts to limit it to 1.5°C above pre-industrial levels. Currently, the global surface temperature is already about 1.1°C higher than it was in the late 1800s, and emissions are still rising. To limit global warming to 1.5°C, emissions should be reduced by 45% by 2030 and a goal of zero net emissions by 2050 should be reached (source: United Nations).

While the challenge is global, the action is led by each State for its own perimeter, the "nationally determined contribution" (NDC). In France, the legislative and regulatory framework for the energy transition is that set out in the Law on Energy Transition for Green Growth (LTECV), which established the National Low-Carbon Strategy (SNBC).

In 2021, the Climate Plan has set new targets, including achieving carbon neutrality by 2050 (enshrined in the law of 8 November 2019 on energy and climate).

Carbon neutrality is a balance between emissions by sources and absorptions by sinks of greenhouse gases. In France, achieving carbon neutrality by 2050 implies a division by 6 of greenhouse gas emissions on its territory compared to 1990. In concrete terms, this means reducing France's emissions to CO²80mt, compared with CO²458mt in 2015 and CO²445mt in 2018 (source: <https://www.ecologie.gouv.fr/strategie-nationale-bas-carbone-snbc>). At the global level, GHG emissions from human activity represented 55.3 billion CO² (2018), an increase of 65% since 1990 (vs. -18% for France over the same period). For the record, emissions only measure what is generated by the country's economic activity, whereas the carbon footprint measures overall consumption. In 2019, the total mass of France's footprint was CO²663mt eq, a level 7% higher than in 1995. Emissions associated with imports accounted for almost half of the total footprint.

Figure 7: GHG emission and sink targets between 1990 and 2050e (MtCO2eq)



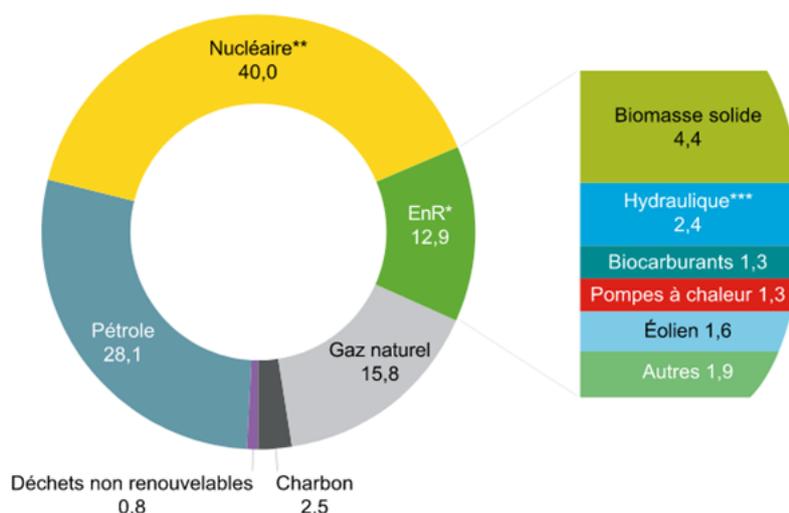
Source: SNBC

A unique French energy mix

Of the 2 651 TWh of primary energy consumed in France in 2020 (2 571 not corrected for climatic variations), 348 TWh were of renewable origin, which represents 13% of this consumption (15% at EU level - Eurostat 2019) and 19.1% of the gross final energy consumption in France in 2020 (22.1% for the EU).

The share of renewables in the French primary energy mix has increased by an average of 5 points over the last ten years (it was 8.3% in 2010) and will be the fourth largest primary energy source in 2020 behind nuclear (40%), oil products (28%) and natural gas (16%).

Figure 8: Distribution of primary energy consumption in France



Sources: SDES, France's energy balance

The high share of nuclear power undoubtedly delayed the development of renewable energy. On the one hand because they were very dependent on public subsidies to be competitive and on the other hand because the French energy mix was already much less carbon intensive than that of other EU members.

According to RTE, "in 2020, fossil fuels represented 63% of the 1,600 terawatt-hours (TWh) consumed in France (final energy), compared with 25% for electricity (449 TWh). To achieve carbon neutrality in 2050, electricity would have to cover 55% of the 930 TWh of energy consumed (i.e. a drop of more than 40% in energy consumption) or 645 TWh including hydrogen production. RTE published six scenarios at the end of 2021, which can be consulted here: <https://www.vie-publique.fr/en-bref/282092-transition-energetique-et-neutralite-carbone-les-scenarios-de-rte>. 3 scenarios do not include any nuclear energy, 3 with variable shares. The 6th scenario, which takes into account a 50% contribution of nuclear power to electricity production, seems to us to be the closest to the political will expressed recently.

In any case, RTE considers that it is impossible to achieve carbon neutrality without a significant development of renewable energies. At the same time, doing without new nuclear reactors would imply faster development rates for renewable energies than those of the most dynamic European countries.

In spite of the government's desire in the summer to reduce the time required for appeals and the various constraints that weigh on the development of many renewable energy projects on the territory, we do not think that France should suddenly start to move more quickly than its neighbours in this area. Beyond the reluctance of local communities, the trained human resources would probably not be available on the necessary scale.

Reducing GHG emissions in France and Europe: what are we talking about?

In 2018, GHG emissions on the French territory represented CO₂ 445 mt eq, of which 74.5% are CO₂ and 12.6% are methane (CH₄). They decreased by 19% over the period 1990-2018.

As in the European Union as a whole, energy use is the main source of GHG emissions in France. It accounted for CO₂ 312 mt in 2018, or 70.1% of the national total, followed by agriculture (16.8%).

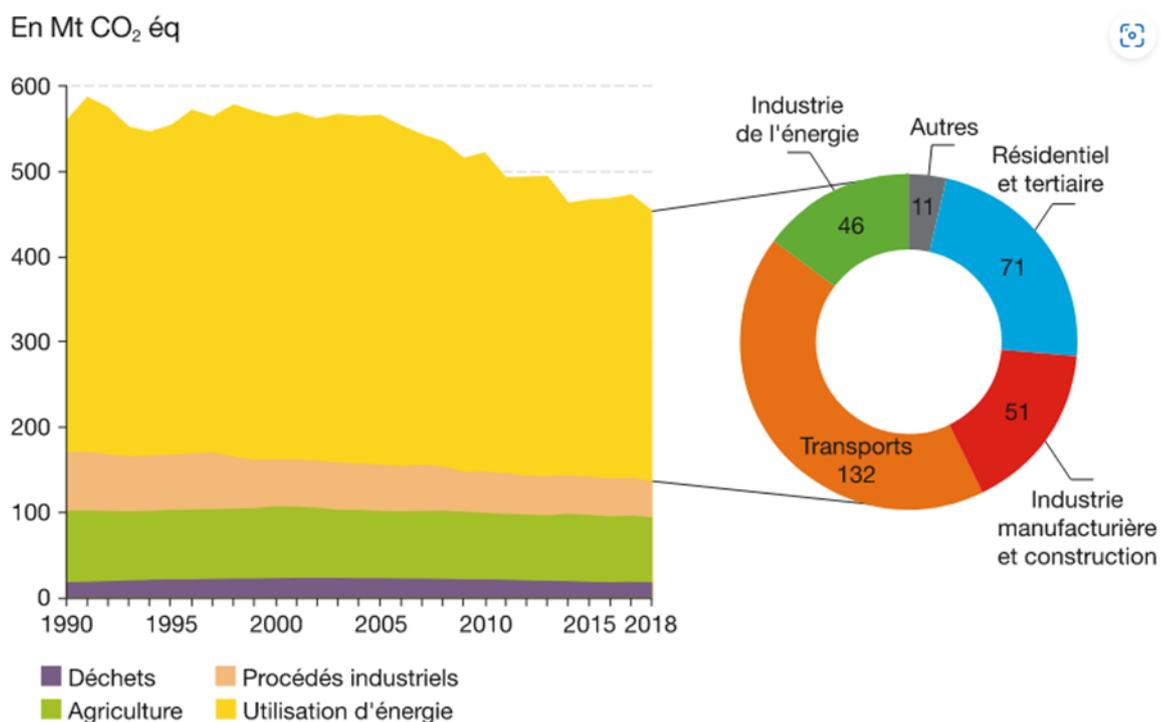
France differs from the EU in its low share of emissions from the energy industry (10% of the total), due to the large share of nuclear power in electricity production. Transport is the main emitting sector, with CO₂ 132 mt eq, or 30% of the national total.

Over the longer term, emissions from energy use were reduced in all sectors except transport (+8%). The most notable decreases were in the energy industry (-41%) and in manufacturing and construction (-35%).

In 2018, the EU's GHG emissions amounted to CO₂ 3.8 Gt eq. CO₂ accounted for 81% of these emissions, and 10% of them were methane (CH₄). They decreased by 22.5% over the period 1990-2018.

In the European Union in 2018, energy use remained the main source of GHG emissions (77.2%), with 28.9% from the energy industry, including electricity generation, and 22.0% from transport. It is followed by agriculture (10.5%) and industrial processes (9.1%).

Figure 9: Breakdown by source of GHG emissions in France between 1990 and 2018



Sources: EEA, 2020; [Panorama français des gaz à effet de serre | Chiffres clés du climat \(developpement-durable.gouv.fr\)](https://developpement-durable.gouv.fr)

Energy prices in France: a political issue

In addition to the fluctuations of the world oil and gas markets, there are some typically French characteristics in their complexity and political sensitivity.

In order to share the "nuclear rent", the ARENH (Regulated Access to Historic Nuclear Electricity) allows electricity suppliers competing with EDF in France to buy back part of its nuclear production from the electricity company at a rate of €42/MWh for a maximum of 100 TWh. Defined in the NOME law, this mechanism was put in place for a transitional period between 2011 and 2025. On 13 January 2022, the government announced the increase "exceptionally by 20 TWh of the volume of ARENH to be delivered in 2022 [...] with a price for these additional volumes of ARENH of €46.2/MWh".

Since the opening to competition, there have been both contractual prices that can be revised (market offers) and regulated prices monitored by the Commission de Régulation de l'Énergie (CRE). The CRE proposes price changes but it is the government that decides. In the summer of 2022, while the CRE proposed a 69% increase (excluding VAT) in the regulated gas tariff, the government froze prices at the October 2021 level until 31 December 2022. For electricity, the CRE proposed 39%, which was also rejected by the government. In accordance with the energy-climate law of 8 November 2019, the regulated sales tariffs (TRV) for gas will end on 30 June 2023 for private individuals and co-ownerships. For small professionals, the end of the TRVs came into effect on 1 December 2020. It has already been in effect for several years for the largest professional customers.

For RE producers this has created additional complexity in the valuation of their production. The peaks reached by energy prices and the French tropism for regulatory changes lead us to a certain reserve concerning the end of government interventions on prices in 2023. Nevertheless, it is likely that they will evolve in the future with greater volatility and closer to market prices.

Public aid

Most of the public support for renewable energies takes the form of purchase obligations and remuneration supplements. Their objective is to compensate for their higher cost than nuclear and/or fossil energy in order to give the necessary visibility to long-term infrastructure projects. Together with the National Low Carbon Strategy, the Multiannual Energy Programme (PPE) is the second element of the law on energy and climate adopted in November 2019. The PPE provides for guaranteed feed-in tariffs and purchase obligations (12 to 20 years).

Each type of energy benefits from a support mechanism that combines a guaranteed price and a purchase obligation:

- For the electricity sector, "any kilowatt-hour injected into the public grid is purchased by an obliged buyer at a purchase rate, higher than the average market price, fixed in advance and allowing to cover the costs of its installation while ensuring a normal profitability of its project". ([source: ecologie.gouv.fr.](https://ecologie.gouv.fr))
- In the gas sector, any biomethane producer wishing to inject its production into the natural gas transmission and distribution networks is eligible for an open market purchase obligation, subject to the preservation of the proper functioning of the networks. In this system, the injected biomethane is purchased by a natural gas supplier at a purchase price fixed in advance and allowing the investment and operating costs of the biomethane production facility to be covered while ensuring a normal profitability of the project. The purchase obligation is contracted for a period of 15 years.
- In the field of heat: in the collective residential, tertiary, agricultural and industrial sectors, there is the "heat fund" whose management is delegated to Ademe. This fund supports the development of the use of thermal renewable energies: biomass (forestry, agricultural, biogas, etc.), geothermal energy (direct use or via heat pumps), thermal solar energy, recovered energy, as well as the development of heating networks using these energies.
- In the field of transport, an incentive framework has been put in place to encourage the use of biomethane in the transport sector (biomethane used as fuel is called bioGNV). To encourage the development of vehicles with lower CO² emissions, a bonus-malus system has been set up to reward, via a bonus, purchasers of new cars with the lowest CO² emissions, and to penalise, via a malus, those who opt for the most polluting models. Hydrogen-powered electric vehicles are part of the clean mobility solutions. As a complement to battery electric vehicles for certain uses, they benefit, like all electric vehicles, from the bonus-malus mentioned above. The development of hydrogen mobility is still in its infancy, but it offers significant advantages in that it can be recharged in a short time (less than 5 minutes) and has a greater range than battery electric vehicles.

In 2021, the EU made climate neutrality, i.e. the goal of zero net emissions by 2050, legally binding.

The European Green Deal is the EU's roadmap to become climate neutral by 2050.

To reach an intermediate target of a 40% reduction in greenhouse gases by 2030, the Commission estimates that an additional €260bn of investment per year is needed. To support the Green Deal, the Commission presented a €1bn financing plan in January 2020.

About half of this amount will come from existing budgets, at least 30% of which will be allocated to climate and environment. Additional public and private investments should be mobilised through InvestEU (€20bn of the €75bn for sustainable infrastructure and €45bn from 2021 to 2027 for "Just Transition" projects targeting coal-dependent regions) and the European ETS (see below).

Most of the projects developed by renewable energy companies seek to benefit from this public support in varying proportions. The war in Ukraine with the rationing of Russian gas exports on the one hand and the lack of availability of nuclear power on the other have caused energy prices to soar in the summer of 2022.

The question of public aid may seem to be in the background. However, in our opinion, it will remain a structuring factor for the financial set-up of projects because it establishes a minimum IRR floor for investors.

The current feed-in tariffs

For biomethane, the feed-in tariff guaranteed by GrdF for 15 years is between 64 and 139 €/MWh. It depends on the size of the installation, called the maximum biomethane production capacity, expressed in Nm³/h, and the nature of the waste treated. For anaerobic digestion plants, the feed-in tariff is made up of a reference tariff and an input premium: household waste is less well paid than sewage sludge or agricultural inputs (from €5 to over €30 per MWh).

The feed-in tariffs for photovoltaic electricity in Q3 2022 are between €107 and €202 per MWh for full sale and between €60 and €100 for surplus sale.

From €50/MWh at the beginning of 2021, the wholesale price rose to €222/MWh in December 2021. In the summer of 2022, it rose to as high as €700. The current feed-in tariffs are therefore well below market prices. However, they provide long-term visibility and have been higher than wholesale prices for a long time. They are intended to allow the amortisation of recent installations, whereas wholesale prices reflect installations that have been amortised for a long time.

Many energy market specialists argue that beyond the cyclical elements of the war in Ukraine, the long period of cheap energy is over. The energy transition would indeed be inflationary in nature with the replacement of controllable energy sources (gas, coal, fossil fuel, nuclear) by non-controllable sources (wind, solar). In addition, climate change is affecting the yields of hydroelectricity and even wind power. It is too early to know where wholesale prices will be in the medium to long term, but it is likely that the issue of compulsory feed-in tariffs will no longer be as acute in the future.

Carbon pricing: potential opportunities for RE companies

Two instruments put an explicit price on carbon: the carbon tax sets a price per tonne of CO² and the Emissions Trading Scheme (ETS) sets a maximum amount of allowable emissions.

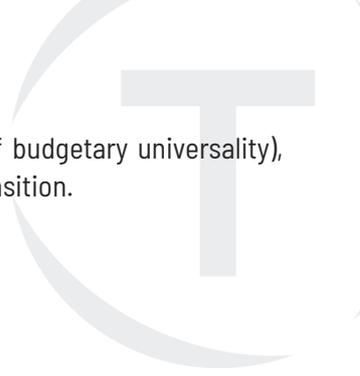
Carbon tax levels vary widely between countries from €123 in Sweden to less than €1 in Poland. France is at 49€ but the evolution was frozen in 2019 to put an end to the "Gilets Jaunes" movement (the Energy Transition Law foresaw an amount of 56€ in 2020 and 100€ in 2030...). Within the EU, some countries do not have any, such as Italy or Belgium, or only since 2021 for Germany and 2022 for Austria. The taxes generally relate to activities not covered by emission allowances.

The EU has had an Emissions Trading Scheme in place since 2005 as the main tool of its climate strategy. The EU reduces the overall amount of allowances allocated annually. Companies can either buy or sell allowances and face fines if they produce more than their allowances. The EU ETS covers about half of the EU's emissions and is estimated to account for about 75% of global carbon trading. Other countries have set up carbon markets: Canada, China, Japan, New Zealand, South Korea and Switzerland. Within the framework of the Paris Agreements, allowance trading can be set up between these different systems.

According to the World Bank (<https://carbonpricingdashboard.worldbank.org/>), all the carbon pricing mechanisms will cover the equivalent of 11.8Gt of CO² in 2022, i.e. 23.1% of global emissions. In 2021, the revenues from all these systems generated \$84 billion, despite the absence of the United States (even though some states have implemented it), India and Brazil, which do not have a policy in this area.

In 2019, globally, 47% of these revenues were used to finance low-carbon transition projects and 42% were allocated to the general public budget of the jurisdiction (country, province, city) that introduced the tax or allowance market. The remaining 5% finances tax exemptions and 6% is transferred directly to businesses

and households. In France, earmarking of revenues is not possible (principle of budgetary universality), however, exceptionally, 20% of taxes on fossil fuels are earmarked for energy transition.



ENR sectors in France

Below we present a few points of reference on the renewable energy sectors represented on the French stock market. It should be remembered that while wind power and photovoltaics are considered low-carbon energies, this is not the case for biomass, biogas and biomethane.

We do not deal here with hydro, solar thermal, geothermal, heat pumps and biofuels.

Lexical reminder: power, production and load factor...

Power: The units derived from the Watt (terawatt: TW, gigawatt: GW, megawatt: MW, kilowatt: KW) are units of power that designate the production capacity of an electrical installation (wind farm, solar panel, nuclear power plant, etc.). It is the maximum energy that the installation can produce in 1 second. As a reminder, one terawatt (TW) corresponds to 1,000 gigawatts (GW) and 1,000,000 megawatts.

Production: The megawatt-hour (MWh) or KWh etc. is the amount of energy produced in one hour by the installation. A given production capacity in MW will produce over a year a certain number of MWh etc...

If a 1 MW power plant were to operate at full power all the time, it would produce 8,760 MWh per year (24 hours for 365 days).

In order to compare installations, their production capacities are not sufficient, it is necessary to compare the annual quantities produced which reflect their availability and therefore their real yields.

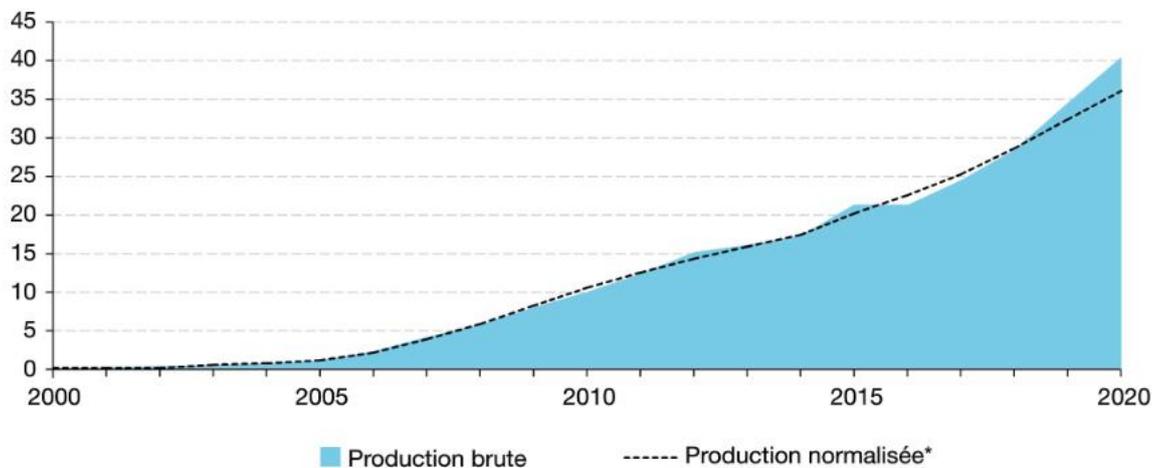
Load factor: The energy produced in relation to the installed power is called *the load factor*. It varies by region and weather conditions. It is therefore not possible to strictly compare the installed capacity of one type of power plant with the other. The load factor was 26.35% for wind and 14.65% for solar in 2020 in France in average. The load factor for solid biomass varies from 30% to 90%. In the biomethane or mine gas sector, the load factor can be as high as 95% because only the maintenance periods are not productive.

Source : <https://opendata.reseaux-energies.fr/>

Wind

Fundamental to France's renewable energy policy, wind power is less represented among the smaller players, with the notable exception of the largest Neoen and Voltalia, and to a lesser extent Lhyfe.

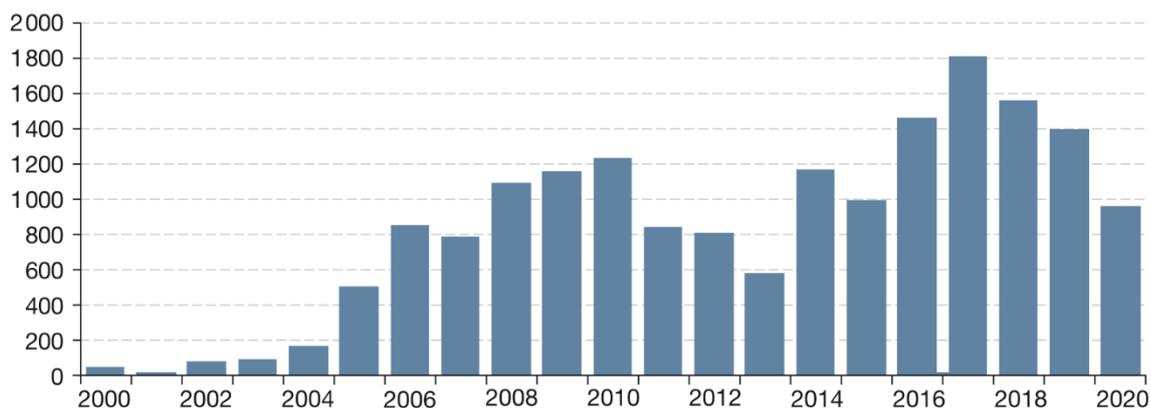
Graph 10: Evolution of wind power generation (TWh)



Source: SDES

While all sizes of installations coexist, more than 80% of electricity production comes from 62% of them, those larger than 8 MW. Faced with strong local opposition, the new installed capacities have tended to decrease in recent years. To try to counteract this trend, the government announced in the summer of 2022 a bill to accelerate the energy transition which will aim to lighten procedures and appeals for a period of 48 months.

Chart 11: Installed capacity by year of commissioning (MW)

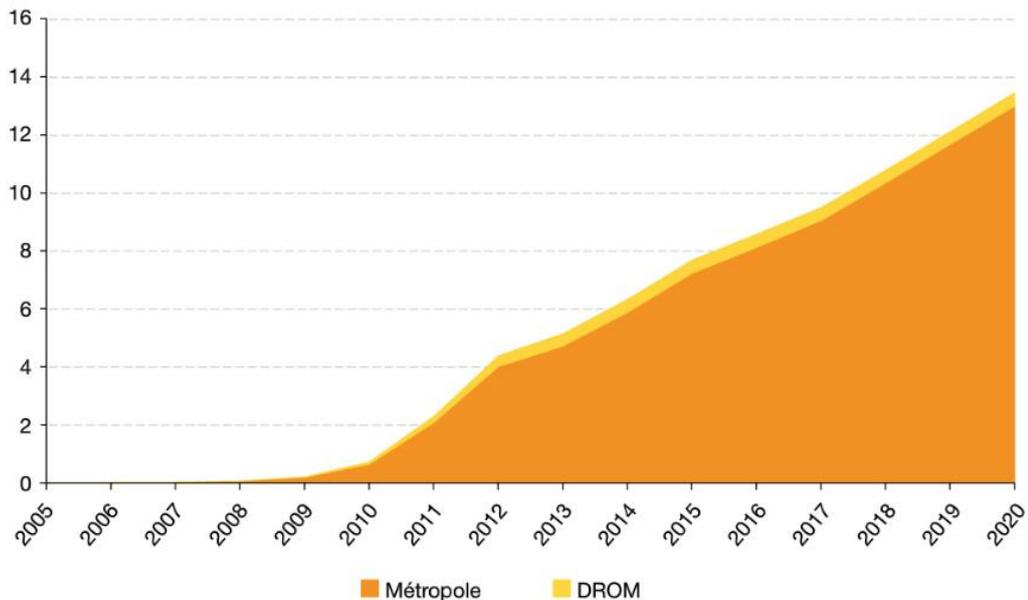


Source: SDES

Photovoltaic

Neoen, OKwind, La Française de l'Energie, Voltalia and potentially Hydrogène de France install and operate photovoltaic power plants. Benefiting from attractive guaranteed purchase prices and the gradual decrease in module prices until 2020, the sector has developed strongly in France since 2009. Since 2021, the strong inflation of modules has not slowed down the activity thanks to the surge in energy prices. Production now stands at 13.6 Twh. Self-consumption (OKwind's core business) is growing strongly and has reached 116 Gwh in 2019.

Graph 12: Evolution of solar photovoltaic electricity production (TWh)

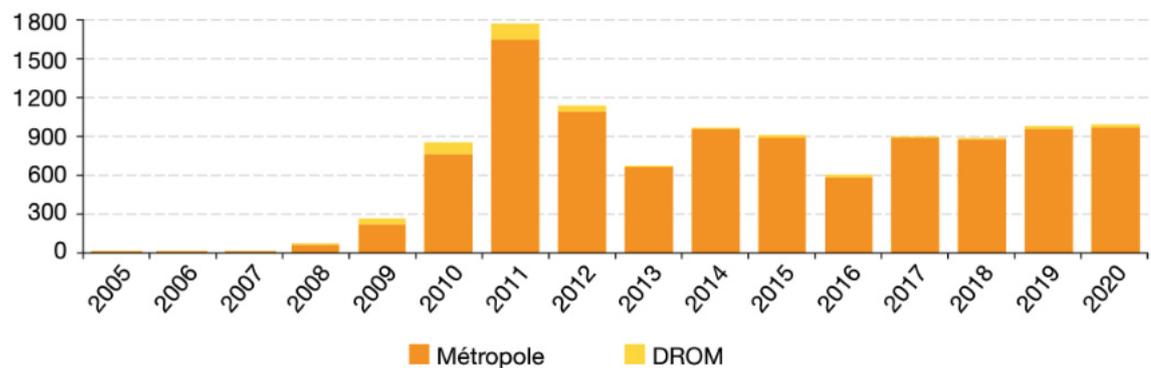


Source: SDES

Unlike wind turbines, where there is a proportionality between the number of installations and power, the most powerful installations (>100kW) are few (<5% of the total number), but provide 2/3 of the total production. 70% of the installations have a power of less than 3kW and represent less than 10% of the total power.

With less opposition from local communities, the installed capacity each year remains stable. The 2021 figures marked a sharp acceleration and overtaking of new connections vs. wind which continued to decline. [Update on the development of wind and solar-photovoltaic in Q1 2021.](#)

Chart 13: Installed capacity by year of commissioning (MW)



Source: SDES

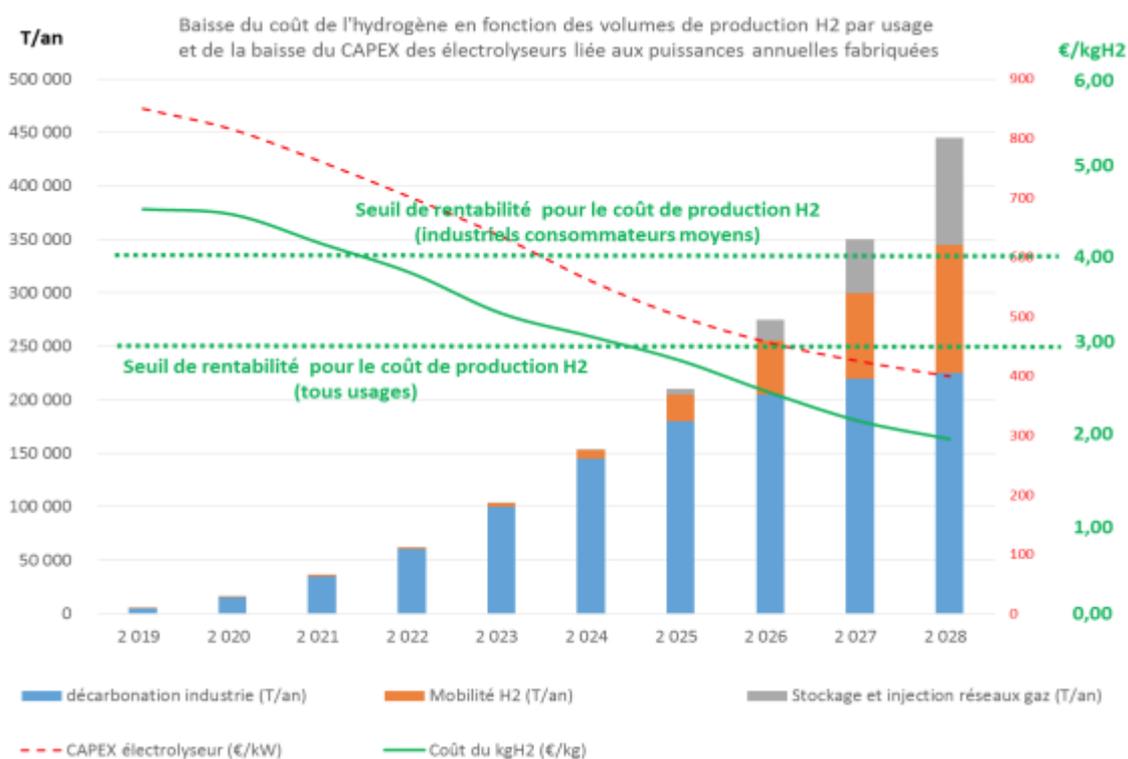
Hydrogen

HDF Energy and Lhyfe are hydrogen-electricity pioneers who are developing green hydrogen production plants, i.e. from renewable energy sources (wind or solar), combined with fuel cells. Haffner produces hydrogen from biomass (wood, agricultural and forestry residues, animal waste, etc.).

France wishes to develop a French electrolysis sector, which appears to be the most promising process, by setting a target of 6.5 GW of electrolyzers installed by 2030. Hydrogen produced by electrolysis costs today around 4€/kg to 6€/kg depending on the electrolysis technology for a duration of use of about 4,000 to 5,000 h per year and a cost of electricity around 50€/MWh. This cost could reach, by 2028 of the EPP, 2 to 3€/kg, an order of magnitude comparable to the price paid today by the major industrial consumers of hydrogen of fossil origin.

The French plan, €7.2bn between now and 2030, should make it possible to develop profitable green hydrogen production, but also to democratise its uses, particularly in heavy mobility. The need for hydrogen in France is about 900,000 tonnes per year.

Graph 14: Forecast of theoretical evolution of hydrogen production costs



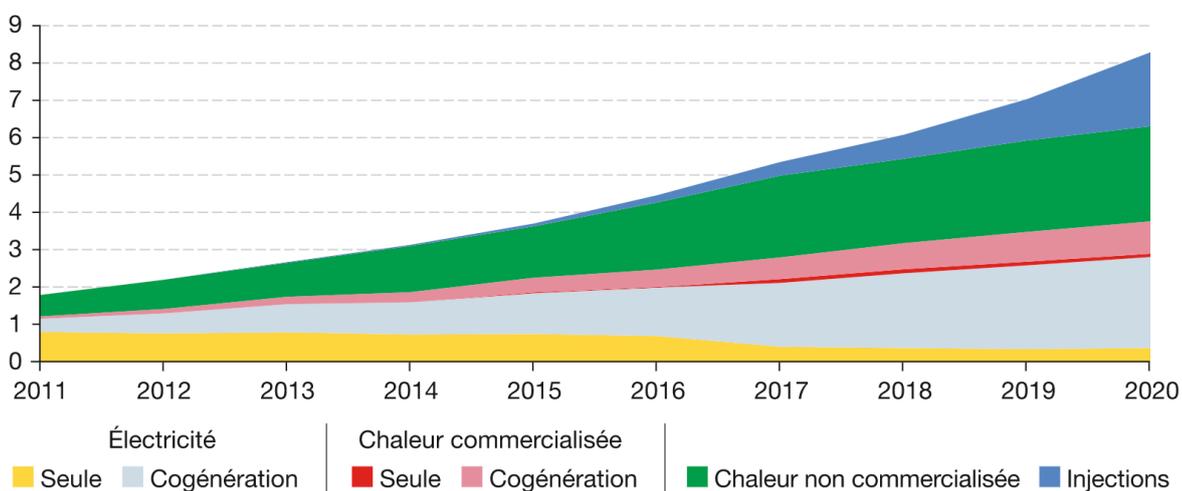
Source: National Hydrogen Council (NHC) - 2021

Biogas

Biogas is traditionally extracted by methanisation of agricultural residues (Charwood, Agripower) and waste (Waga). New technologies are being developed by groups such as Haffner (biomass thermolysis) and La Française de l'Energie, which has just acquired Cryopur (cryogenics).

Until the last few years, biogas was mainly used to produce electricity and heat, a large part of which was consumed on site. In recent years, an increasing proportion (24% by 2020) has been fed into the grid as biomethane (see below).

Graph 15: Evolution of energy production from biogas (TWh)



Source: SDES,

Like the photovoltaic sector, a large proportion (60%) of electricity production is generated by a small minority (15%) of installations: those with a capacity of over 1MW. The most numerous (70%) are those below 0.5MW: their production represents less than 25% of the total power.

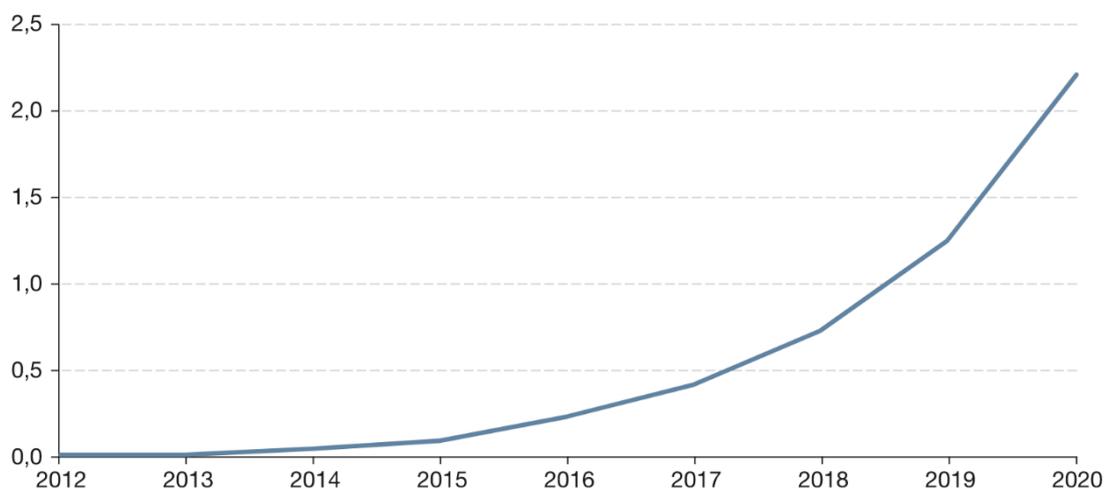
Increasingly present in the agricultural world, the sector is marked by self-consumption and an atomisation of production.

Biomethane

The biomethane sector is directly derived from the biogas sector and is experiencing strong growth (+80% in 2020 to 2.2 TWh). Biomethane is fully miscible with natural gas and can therefore be injected into existing networks. It is the main market targeted by players like Waga. The process acquired with Cryopur by La Française de l'Energie allows biogas to be liquefied to make bioGNL and thus free itself from the constraints of the networks to address, in particular, the fuel sector.

At the end of 2020, there were 214 installations in operation with a total capacity of 3.9 TWh. 1,164 projects are under development with a capacity of 26 TWh per year. The growth of the sector is therefore still in its infancy.

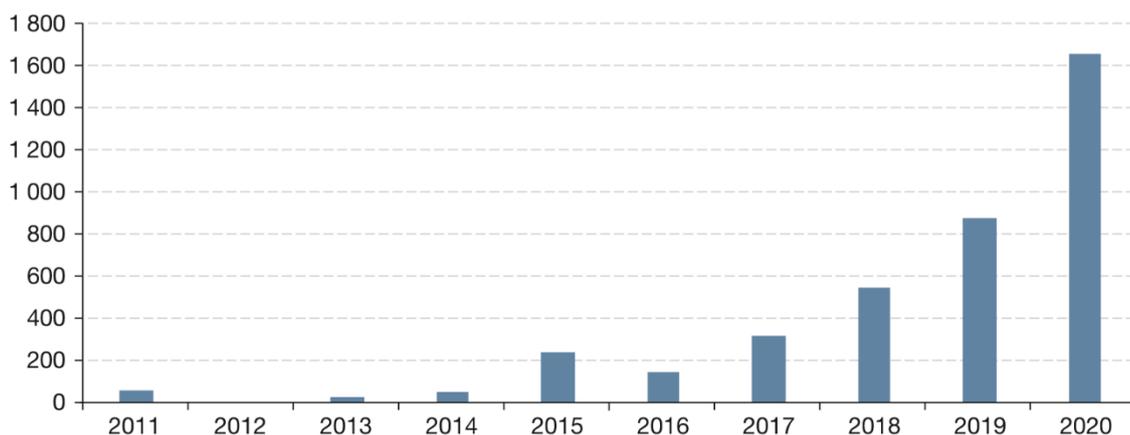
Graph 16: Evolution of biomethane injections (TWh PCS)



* PCS : pouvoir calorifique supérieur.

Source: Network managers

Graph 17: Maximum biomethane production capacity of new installations by year of commissioning



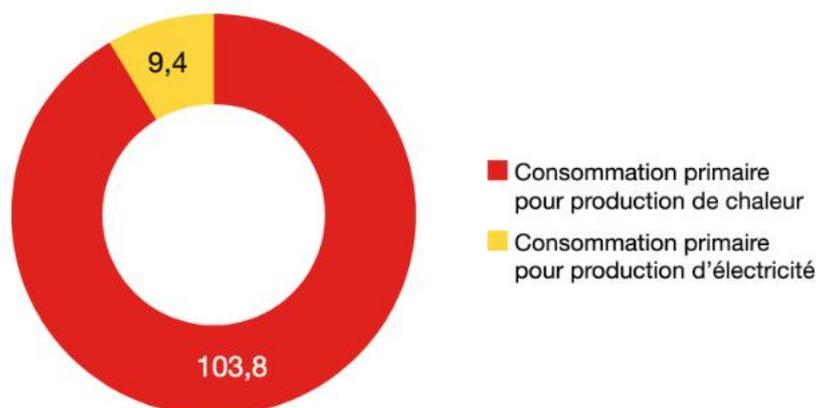
Source: Network managers

The core of the market is made up of medium-sized installations (between 15 and 30 Gwh/year) which, with 38% of the installations in number, represent about 44% of the production capacity. More than 50% of the installations have a capacity of less than 15 GWh and account for 28% of the production capacity. The largest installations (>30 GWh) represent only 10% of the installations but as much capacity (28%).

Solid biomass

Charwood's historical activity is included in the solid biomass sector as defined by the statistical services of the Ministry of the Environment. For the most part, the primary consumption of solid biomass is used to produce heat (wood boilers, pellets, etc.) and, more marginally, to produce electricity.

Chart 18: Primary consumption of solid biomass by use in 2020 (TWh)

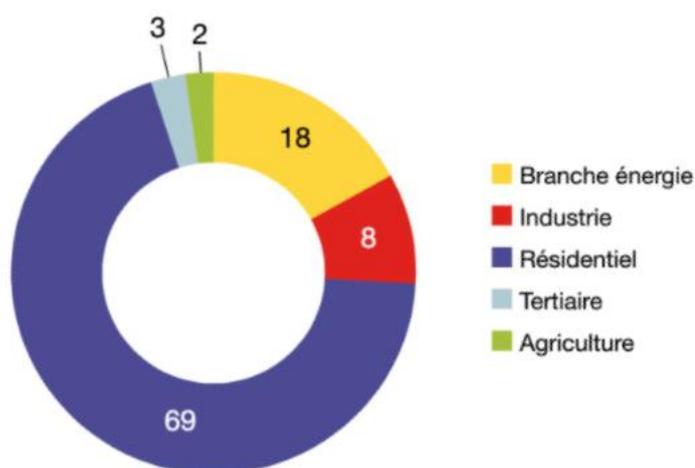


Source: SDES

The residential sector is the main consumer of wood energy with 69% of primary consumption. Its share is being reduced in favour of the energy sector, which will reach 18% in 2020, compared to 6% in 2012, thanks to the development of cogeneration installations and heating networks.

Figure 19: Primary wood energy consumption by sector in 2020 (101 TWh)

En %



Note : le bois-énergie recouvre ici le bois, les granulés de bois et les résidus de bois (hors liqueur noire).

Source : calculs SDES

Source: SDES

Mine gas: a special case of recovered energy

To our knowledge, La Française de l'Energie, through its subsidiary Gazonor, acquired from Charbonnage de France and exclusive holder of the concessions for the exploitation of mine gas in the Nord and Pas-de-Calais regions, is the only French mine gas operator. After a mine has been abandoned, the firedamp, known as "mine gas", continues to be released into the thousands of kilometres of disused galleries from which it can escape into the atmosphere via natural or artificial conduits, faults, mine collapses or through permeable rocks. This release presents a risk of ignition or explosion. When the collieries were closed, decompression wells were installed. They act as safety valves by regularly releasing the mine gas into the atmosphere in a controlled manner, like a pressure cooker.

Like natural gas, mine gas contains mostly methane (CH₄). The global warming potential (GWP) of methane is 28 times higher than that of CO₂ on a century scale (85x instantaneous).

Mine gas is not a renewable energy but a recovery energy that avoids pollution that would otherwise have occurred.

As the market price of electricity at the time did not allow the necessary investments to be economically justified, the French government introduced a support mechanism in October 2016 by defining a feed-in tariff for the sector.

A variety of actors

We describe the 10 French small and medium-sized listed companies active in the development of renewable energy projects and production (excluding equipment manufacturers). Our aim is to help investors identify the characteristics of each of them beyond their common theme. We question the conditions necessary to achieve very ambitious targets that support high valuation levels.

These independent players develop by exploiting one or more primary energy sources as shown in the table below. Depending on the development opportunities, some of them expand their activity to cover all or part of the spectrum of possible energy sources.

Table 3: Energy sources operated by listed French players

	Biomass	Wind	Solar	Mine gas
Agripower	X			
Charwood Energy	X			
OKwind Group		X		
Haffner Energy	X			
Hydrogène de France			X	
La Francaise de l'Energie	X		X	X
Lhyfe		X		
Neoen		X	X	
Voltalia *	X	X	X	
Waga Energy	X			

* Voltalia also operates a small hydro power plant in Haute-Savoie. Sources: Companies, Theia Recherche

Some of these companies simply install and maintain production capacity for third parties, others are full producers, either directly or through SPVs, and finally, a few operate both models or move from the former to the latter.

Table 4: Type of business models of French listed companies

Third party account	Own account	Mixed
Agripower	Hydrogène de France	Charwood Energy
OKwind Group	La Francaise de l'Energie	Haffner Energy
	Lhyfe	Voltalia
	Neoen	Waga Energy

Sources: Companies, Theia Recherche

Depending on their technologies, markets and stages of development, their production differs. Here again, the models vary from the specialist to the generalist capable of converting primary energy into different uses.

Table 5: Production of French listed players

	Electricity	Gas	Heat	Hydrogen	Storage	Biochar
Agripower	X	X	X			
Charwood Energy	X	X	X			X
OKwind Group	X					
Haffner Energy				X		X
Hydrogène de France				X		
La Française de l'Énergie	X	X	X			
Lhyfe				X		
Neoen	X				X	
Voltaia	X				X	
Waga Energy		X				

Sources: Companies, Theia Recherche

High ESG ratings

To our knowledge, 9 out of the 10 companies in our panorama have undergone an ESG rating. 8 by Ethifinance, 1 by Moody's. All have satisfactory or even high scores, given that, according to Ethifinance, the average of their panel in this segment is 46/100. The lowest rating displayed is 54/100, which corresponds to "advanced maturity" status, as do all ratings between 50/100 and 75/100. Voltaia's rating corresponds to "exemplary maturity".

Table 6: ESG ratings of French listed companies

	Ethifinance	Moody's
Agripower France SASU	ND	
Charwood Energy S.A.	56	
OKwind Group	54	
Haffner Energy SAS	67	
Hydrogène de France	66	
La Française de l'Énergie SA	65	
Lhyfe SA	71	
Neoen S.A.		65
Voltaia	78	
Waga Energy SA	70	

Source: companies

High valuations and producer premiums

In France, within our universe

Neoen and Voltalia are established groups compared to the other 8 stocks presented in this study: their current size reflects what they could become in 5 to 10 years. Both groups are profitable and have achieved EBITDA margins of 90% for Neoen and 34.5% for Voltalia in 2021. La Française de l'Energie is also profitable and achieved an EBITDA margin of 29% for its last financial year 2020/21. In the first half of 2021/22, its EBITDA margin reached 62%.

Their stages of maturity are very diverse and the growth rates cannot be used as a basis for comparison. Some start with less than 1€M of turnover such as Lhyfe, Haffner or Hydrogène de France, which can be assimilated to design offices having validated "proof of concept" on the point of becoming producers, whereas the others already have a significant commercial base.

The turnover targets are set for horizons ranging from 2024 to 2027. In order to facilitate the comparison, we have established the implicit CAGR of these targets and applied these CAGR to the 2021 revenues to extrapolate what the 2024 revenues of all 10 companies could be (for Neoen and Voltalia we have based ourselves on the Factset consensus).

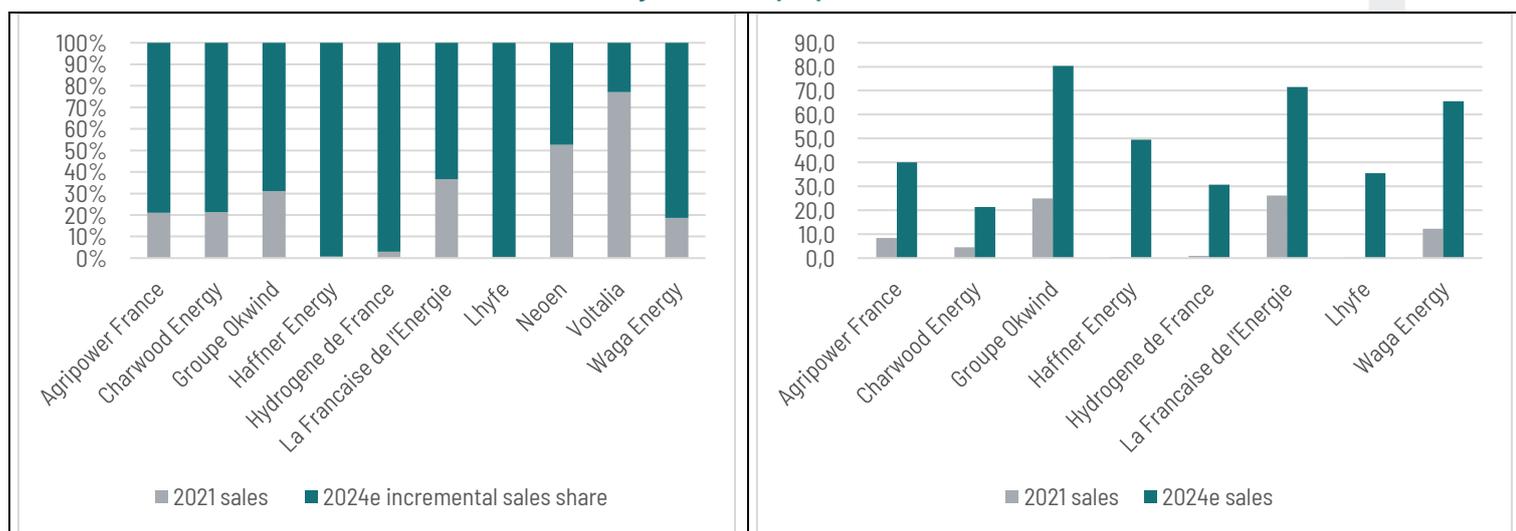
Table 7: Ambitious or expected turnover growth rates

(€m)	Sales 2021	Target year	Sales guidance	Implied sales CAGR	Sales 2024e
Agripower France	8,4	2024	40	68%	40
Charwood Energy	4,6	2027	100	67%	21
OKwind Group	25,0	2026	175	48%	80
Haffner Energy	0,4	2026	250	405%	49
Hydrogène de France	0,9	2025	100	226%	31
La Française de l'Energie	26,2	2026	100	40%	72
Lhyfe	0,2	2026	200	464%	35
Neoen*	333,6	2024e	633,2	24%	633
Voltalia*	461,3	2024e	597,9	9%	598
Waga Energy	12,3	2026	200	75%	65

*For Neoen and Voltalia, we have used the 2024 turnover expected by the Factset consensus. Sources: Companies, Theia Recherche, Factset

As shown in the graphs below, the share of turnover to be achieved incrementally by 2024 to be in line with expectations ranges from 99% to 23% for Voltalia, the most mature of the sample.

Table 8: Visualisation of the turnover to be achieved by 2024 as a proportion of current turnover



Sources: Companies, Theia Recherche

The market's confidence in the potential of French producers of renewable and recovered energy is largely granted by the market, as shown by the valuation levels of groups whose turnover is essentially in the making.

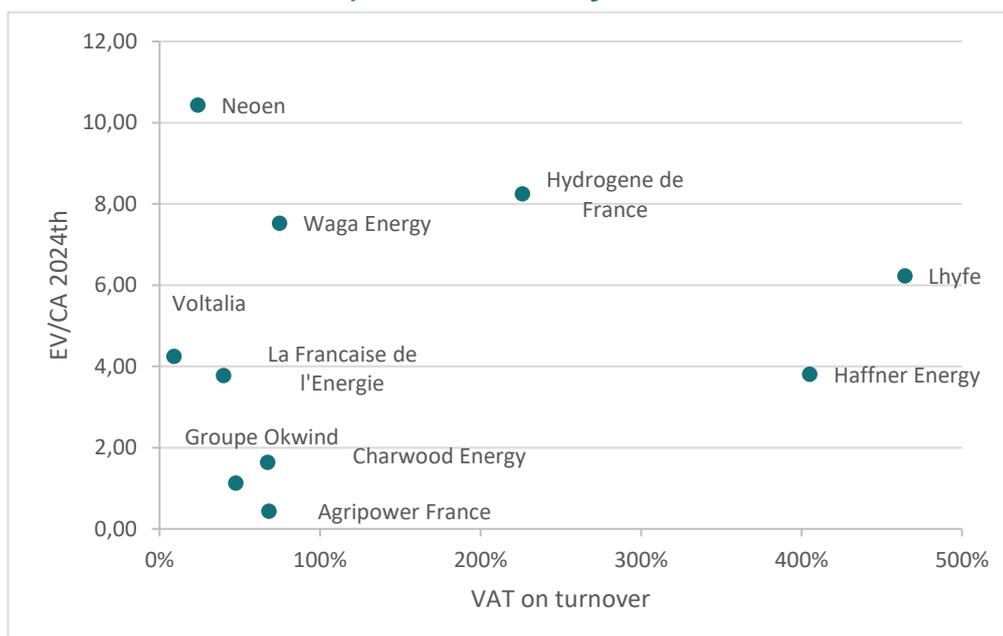
Table 9: Valuations based on target or estimated turnover (28/09/22)

(€M)	Capitalisation	EV	EV/Sales 2021 (x)	EV/Sales 2024e (x)
Agripower France	29	17	2,0	0,4
Charwood Energy	35	35	7,6	1,6
OKwind Group	101	90	3,6	1,1
Haffner Energy	244	188	490,4	3,8
Hydrogène de France	346	253	285,7	8,2
La FranSalesise de l'Energie	245	270	10,3	3,8
Lhyfe	367	221	1119,8	6,2
Neoen	3 678	6 606	19,8	10,4
Volitalia	1 734	2 537	5,5	4,2
Waga Energy	618	493	40,2	7,5

Sources: Factset, Theia Recherche

The stock market is giving confidence and valuation levels above what private equity players are willing to pay. The 2021 multiples are not comparable due to the different stages of development. The medium-term objectives are sufficiently similar that the comparison of 2024 EVs/Sales^e gives us the beginnings of a hierarchy between the proposed models.

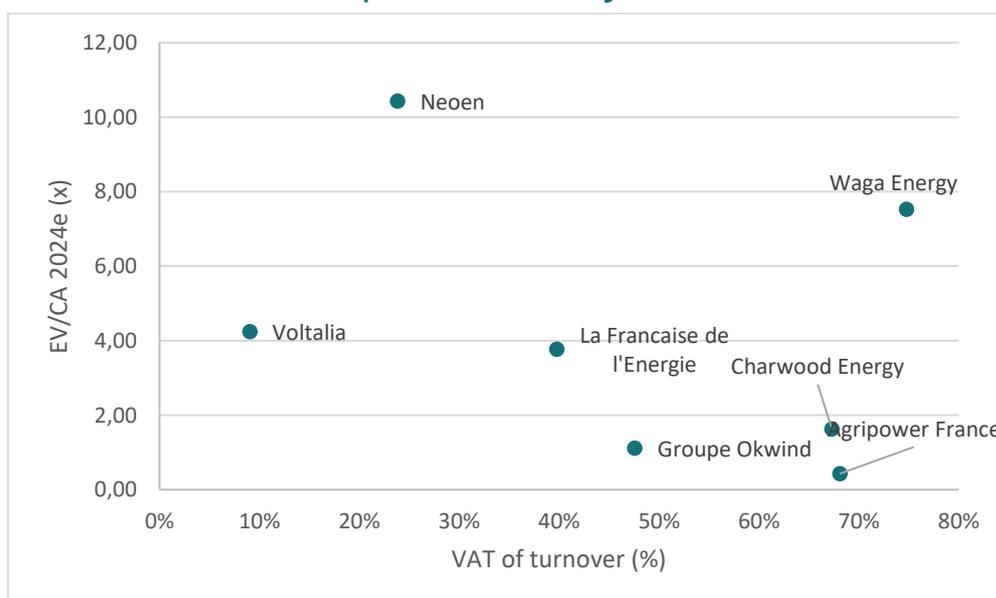
Chart 20: EV/Sales 2024e compared to CAGR of targeted or forecasted turnover*.



*For Neoen and Voltalia, we have used the 2024 turnover expected by the Factset consensus.
Sources: Companies, Theia Recherche, Factset

For ease of reading, the graph below zooms in on the 7 stocks whose turnover CAGR is less than 100%. The two graphs clearly show that the "least" valued stocks, despite higher or comparable CAGR, are those whose models favour third-party installations and are not themselves producers: OKwind Group and Agripower France. We can formulate the hypothesis that Charwood Energy, whose model is at the beginning of its mutation from a 100% third party activity to a 60% own account activity, suffers, in terms of valuation, from the weight of its historical business.

Chart 21: EV/Sales 2024e compared to CAGR of targeted or forecasted turnover*.



*For Neoen and Voltalia, we have used the 2024 turnover expected by the Factset consensus.
Sources: Companies, Theia Recherche, Factset

Attempt to prioritise risk profiles

We have not carried out an in-depth financial analysis of the players presented in this overview. However, we have attempted to rank their risk profiles according to three criteria:

- Share of turnover to be achieved in order to reach the stated objective (see Table 7): the higher the share, the higher the execution risk. Voltalia has the least 'left to do' at 23%, while Haffner and Lhyfe are at the 'proof of concept' stage and have 99% of their turnover to develop;
- Diversification: a company that relies on only one technology presents a higher risk than one that develops several energy sources. Only Neoen, Voltalia and La Française de l'Energie have a diversified mix;
- Sensitivity to energy prices: a third-party model is less risky from this point of view than a mixed model or a proprietary model (see Table 5).

The table below shows the scoring that emerges from these three criteria. A first ranking presents the result by overweighting the criterion of the remaining turnover (50% vs. 25% for the other two), a second ranking is the result of an equal weighting of the three criteria.

This attempt to rank risk profiles is not a stock market recommendation hierarchy but only one indicator among others that allows to anticipate the volatility of certain securities. It is striking to note the absence of correlation between the degree of apparent risk and the current level of valuation.

Table 10: Risk profile ranking of the 10 French players on 3 criteria (1=least risky / 10 most risky)

	Sales to be achieved vs. stated objectives		Diversification	Energy price sensitivity	Rankings				EV/Sales 2024e
	%	Rank			Rank	Rank	Weighted score	Rank	
Agripower	79%	6	4	5	5,25	7	15	8	0,4
Charwood Energy	79%	6	4	1	4,25	4	11	3	1,6
OKwind Group	69%	4	4	5	4,25	4	13	6	1,1
Haffner Energy	99%	9	4	1	5,75	8	14	7	3,8
Hydrogène de France	97%	8	4	7	6,75	9	19	9	8,2
La Française de l'Energie	63%	3	1	7	3,5	3	11	3	3,8
Lhyfe	99%	9	4	7	7,25	10	20	10	6,2
Neoen	47%*	2	1	7	3	2	10	2	10,4
Voltalia	23%*	1	1	1	1	1	3	1	4,2
Waga Energy	81%	7	4	1	4,75	6	12	5	7,5
Weighting		50%	25%	25%					

*Based on the Factset consensus of SALES 2024e; Source: Theia Recherche

Internationally

We have sought to broaden the comparison to European and North American renewable energy players. The tables below show 18 mid caps and 8 large caps in the sector. All energies are represented, as well as reference equipment manufacturers (6 mid caps and 5 large caps).

The variety of models and stages of maturity make it impossible to draw relevant averages. However, it is not surprising to see that the markets have a preference for high growth and high margin profiles, as evidenced by the higher EV/Sales 2024e multiples. The few low-valued small caps in the sample (Good Energy, BayWa) are, for one, a third-party model and, for the other, an agricultural trading company beginning to diversify into renewable energy.

Unlike the majority of French stocks in our sample, the groups presented in the two tables below are, for the most part, profitable. It should also be noted that, internationally, midcaps that are pure player producers have an average EV/Sales 2024E valuation of over 4x.

As a reference, we also present data on the historical French energy companies: the valuation gap with the pure players in renewable energy is significant despite the economic attractiveness of the entire sector. It is therefore their superior growth and profitability potential that explains their valuation.

Table 11: European and global mid caps comparables (27/09/22 - €M)

Name	Equip. / Prod.	Activity (1)	Country	Capit°.	EV	Sales 21	Sales 24e	CAGR Sales 21-24th	EBITDA margin 21	EBITDA margin 24th	EV/Sales 21	EV/Sales 2024e
SMA Solar Technology AG	E	S	All	1 679	1 544	984	1 380	12%	3%	10%	1,6	1,1
Nordex SE	E	E	All	1 861	1 386	5 444	5 872	3%	0%	6%	0,3	0,2
Ballard Power Systems Inc.	E	Storage	Can	2 001	1 057	88	264	44%	-72%	-47%	11,9	4,0
Canadian Solar Inc.	E	S	Can	2 461	5 016	4 465	9 993	31%	8%	10%	1,1	0,5
UGE International Ltd	E	S	US	28	54	2	31	137%	-165%	39%	23,5	1,8
SunPower Corporation	E	S	US	4 491	4 574	1 120	2 319	27%	-1%	11%	4,1	2,0
EnergieKontor AG	P	I/O	All	1 085	1 400	157	314	26%	53%	41%	8,9	4,5
Terna Energy S.A.	P	E	Gr	1 821	2 371	405	490	7%	39%	53%	5,8	4,8
Good Energy Group PLC	P	S	UK	48	25	170	259	15%	3%	3%	0,1	0,1
Brookfield Renewable Partners LP	P	M/S/E	Berm	9 935	49 795	3 444	7 187	28%	59%	46%	14,5	6,9
Innergex Renewable Energy Inc.	P	M/S/E	Can	2 863	7 132	504	975	25%	70%	75%	14,1	7,3
ReneSola Ltd. Sponsored ADR	P	S	US	356	245	67	153	32%	27%	17%	3,6	1,6
Gevo, Inc.	P	Biofuels	US	566	137	1	29	265%	NS	-136%	228,5	4,7
Green Plains Inc.	P	Biofuels	US	1 771	2 536	2 607	3 291	8%	9%	12%	1,0	0,8
Enviva Inc.	P	Biomass	US	4 724	5 968	881	1 938	30%	2%	20%	6,8	3,1
Ormat Technologies, Inc.	P	Geothermal energy	US	5 291	7 142	561	948	19%	53%	60%	12,7	7,5
Sunrun Inc.	P	S	US	7 063	15 235	1 362	2 691	25%	-15%	6%	11,2	5,7
BayWa AG	P	Div	All	1 485	7 798	19 839	23 213	5%	3%	3%	0,4	0,3

1: S=solar, E=wind, H=hydro, Div=diversified; Sources: Factset, Theia Recherche

Table 12: European and global large caps comparables (27/09/22 - €m)

Name	Equip / Prod	Activity (1)	Country	Capi°.	EV	Sales 21	Sales 24e	CAGR Sales 21-24e	EBITDA margin 21	EBITDA margin 24th	EV/Sales 21	EV/Sales 24e
Vestas Wind Systems A/S	E	E	Dan	20 278	20 868	15 587	131 690	104%	8%	12%	1,3	0,2
SolarEdge Technologies, Inc.	E	S	Isr	15 444	16 096	1 662	4 752	42%	12%	19%	9,7	3,4
Siemens Gamesa Renewable Energy, S.A.	E	E	Esp	12 237	14 511	10 173	11 247	3%	4%	9%	1,4	1,3
First Solar, Inc.	E	S	US	14 391	12 909	2 473	4 294	20%	25%	27%	5,2	3,0
Enphase Energy, Inc.	E	S	US	39 363	41 821	1 169	3 653	46%	18%	28%	35,8	11,4
Orsted	P	W	Dan	38 045	46 307	9 297	84 963	109%	9%	32%	5,0	0,5
Acciona SA	P	M/S/E	Esp	10 258	16 037	8 104	9 197	4%	16%	21%	2,0	1,7
EDP Renovaveis SA	P	I/O	Esp	21 718	29 492	1 758	2 761	16%	66%	82%	16,8	10,7

1: S=solar, E=wind, H=hydro; Sources: Factset, Theia Recherche

Table 13: Historical French energy companies (27/09/22 €M)

Name	Equip / Prod	Activity	Country	Capi°.	EV	Sales 21	Sales 24e	CAGR Sales 21-24e	EBITDA margin 21	EBITDA margin 24e	EV/Sales 21	EV/Sales 24e
TotalEnergies SE	P	Diversified	F	121 698	152 320	156 207	237 724	15%	21%	20%	1,0	0,6
Electricité de France SA	P	Diversified	F	46 270	99 046	84 461	87 549	1%	14%	26%	1,2	1,1
ENGIE SA.	P	Diversified	F	30 149	65 556	57 866	61 182	2%	18%	20%	1,1	1,1

Sources: Factset, Theia Recherche

Albioma, friendly takeover bid by the American fund KKR

Albioma, a French group, mainly based overseas, specialising in biomass (86% of its installed ENR capacity) and photovoltaic, was the subject of a takeover bid by KKR announced in March 2022. KKR paid €1.45bn for an installed capacity of 1GW and a turnover of €573m in 2021 with an EBITDA margin of 34.3%, i.e. EV/Sales and EV/EBITDA multiples of 4.1x and 12.0x respectively. Albioma has posted a sales CAGR of 10% per year over the last 3 years. The consensus forecast was for 4% annual sales growth by 2023. The group is still present in coal-fired power plants, which account for 24% of its energy mix, and has to manage a legacy carbon business and invest in renewable energy projects.

KKR, which is heavily invested in infrastructure and energy, offered a 56% premium over the last quoted price before the announcement to support the group's move towards more renewable energy. The beginning of a concentration movement among independent RE players would add speculative value to small and medium-sized listed players.



Agripower: micro and collective methanisation

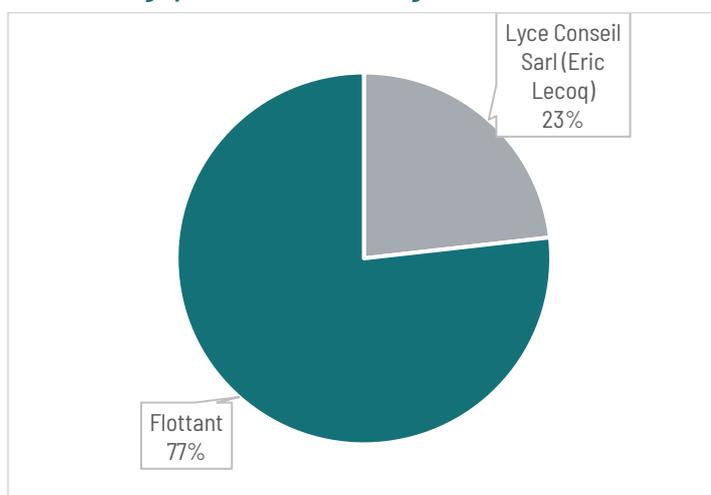
Data (28/09/22)

Sales 2021: 8,4M€	Target Sales 2024: 40M€	Sales implicit CAGR: 68%
Capitalisation: €29m	EV/Sales 2021: 2.0x	EV/Sales 2024^e: 0.4x
Free float: 76.8%	IPO date: 20/11/19	Perf Since IPO: +3.0%

Agripower was created in 2012 by its director Eric Lecoq. From 2012 to 2014, the company focused on developing and perfecting anaerobic digestion solutions based on breakthrough technological choices (stainless steel). Agripower has established two partnerships with methanisation equipment suppliers, Weltec (since 2012) and Bioelectric (since 2014). In 2017, Agripower had 17 units installed and operational. This year, the company had 81 units in France in individual and collective methanisation, mainly located in the Grand Ouest region.

In mid-November 2019, Agripower went public via a €6.75m transaction, of which €5.75m was a capital increase and €1m was proceeds from the sale of existing shares by the main shareholder, Lyce Conseil SARL. In 2021, the company raised €10m in order to facilitate the acquisition of its individual methanisation products.

Chart 22: Agripower's shareholding



Source: Company

Business and strategy

Agripower is specialised in the integration of environmental solutions for the agricultural world. To meet the current market, its main activities are the study, design, installation and maintenance of individual or collective methanisation units.

In March 2022, the group launched a solution for financing individual co-owned methanisation units for farmers that should enable it to capture more value. Agripower wants to unlock projects that run into difficulties by investing as a minority shareholder ($\approx 20\%$), alongside the farmer in a joint operating company that will own and operate the methanisation unit.



Recent activities

Since the beginning of the second half of 2021-2022, the commercial dynamic has accelerated significantly with the signing of 38 new individual methanisation projects for a cumulative value of nearly €12.2M. In total, the order intake since the beginning of the year for these 53 projects amounts to €18.5M, i.e. an increase of +135% compared to the previous year's order intake of €7.7M.

Key success factors

- Quality industrial partnerships (Weltec, Bioelectric)
- A network of important prescribers (Triskalia 18K farmers, Agrial 13K, Eurial 4.5K and Uneal 7.5K), the four partnerships allow Agripower to develop its activity in a competitive segment with low barriers to entry
- Ability to handle more projects by recruiting accordingly

Energy price sensitivity

The electricity or gas produced by the power plants installed by Agripower, is generally sold through long term contracts (15 to 20 years) with a fixed price and/or indexed to inflation for the duration of the contract. The signing of these contracts therefore provides good visibility on the revenues of the installed unit. These fixed or long-term indexed prices are the result of either a decision by the regulatory authorities in the form of tariffs, or of calls for tender launched by these same authorities or by electricity buyers.

Charwood Energy: biomass specialist in transformation

Data (28/09/22)

Turnover 2021: €4,6m

Target turnover 2027: €100m

Sales implicit CAGR: 67%

Capitalisation: €35m

EV/Sales 2021: 7.6x

EV/Sales 2024^e : 1.6x

Free float: 6%

IPO date: 13/07/22

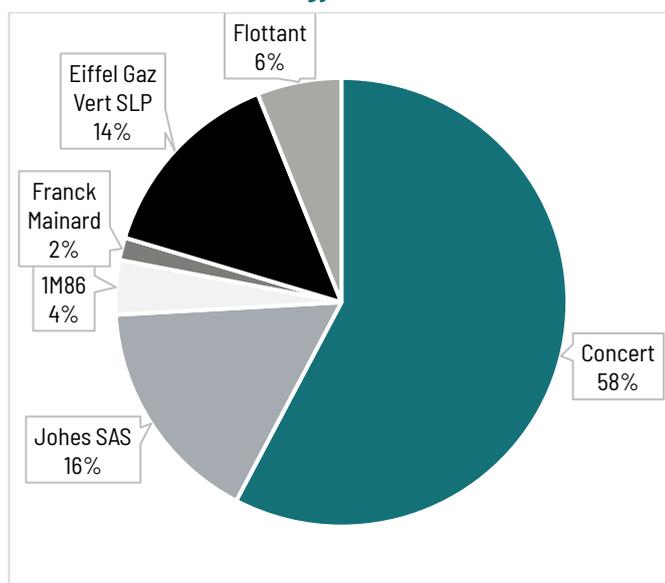
Perf Since IPO: -36.4%

Charwood Energy is a company that has been developing for many years solutions for the valorisation of biomass for third parties through three technologies: combustion (wood boiler), methanisation and pyro-gasification (in partnership with the German company Spanner Re). These installations allow Charwood Energy's customers to produce either heat, gas or electricity.

One of the aims of the recent IPO is to finance the shift of the model to own-account production and thus make Charwood an energy producer by deploying 60% owned pyro-gasification projects.

The traditional business is profitable and has generated an EBITDA margin of 21.7% in 2021 for a turnover of €4.6M. The stated ambition is a change of scale with a 22-fold increase in turnover to reach €100 million in 2027, 60% of which will be generated by the company itself, and an EBITDA margin of 35%.

Chart 23: Charwood Energy



Source: Company

Business and strategy

Charwood, a specialist in customised biomass energy recovery solutions for third parties, is pursuing a growth strategy to become an energy producer through the deployment of pyro-gasification, a German technology which, in addition to producing gas (syngas), sequesters the carbon from the recovered biomass (biochar) in solid form. The biochar can be used in agriculture and improves the carbon balance of the whole process compared to conventional methanisation.



Recent activities

Charwood's IPO took place in July 2022, raising a gross amount of €12.4m at a price of €11.38 at the bottom of the indicative range and without exercising the extension clause and the over-allotment option.

On 20 September, the group announced the signing of three new third-party contracts worth €2m, bringing its secured order book to €4.3m, to be delivered and invoiced in 2022 and 2023. The group published on 28/09/22 its H1 turnover up 27% to €3.2M and the doubling of its commercial pipeline for third parties to €86M vs €43M at the end of March 2022.

Key success factors

- Quadrupling of staff (25=>100) in a tight sector
- Management of a large number of projects in a short timeframe (turnover target based on 30 operational projects by 2027 and 20 in development)
- Questions remain about the long-term effects of biochar in soil improvement (but agriculture is not the only outlet)

Energy price sensitivity

As with the whole sector, high prices improve the IRR of projects and therefore facilitate their commercialisation. However, Charwood has announced that it will develop CPPAs (Corporate Power Purchasing Agreements) which may involve commitments to purchase at pre-agreed prices and less price sensitivity. In addition, forward sales for third parties will not be sensitive to price variations.

OKwind Group: individual self-consumption

Data (28/09/2022)

2021 turnover: €25m

2026 turnover target: €175m

Implied Sales CAGR: 48%

Capitalisation: €103m

EV/Sales 2021: 3.6x

EV/Sales 2024^e: 1.1x

Free float: 12%

IPO date: 8/07/22

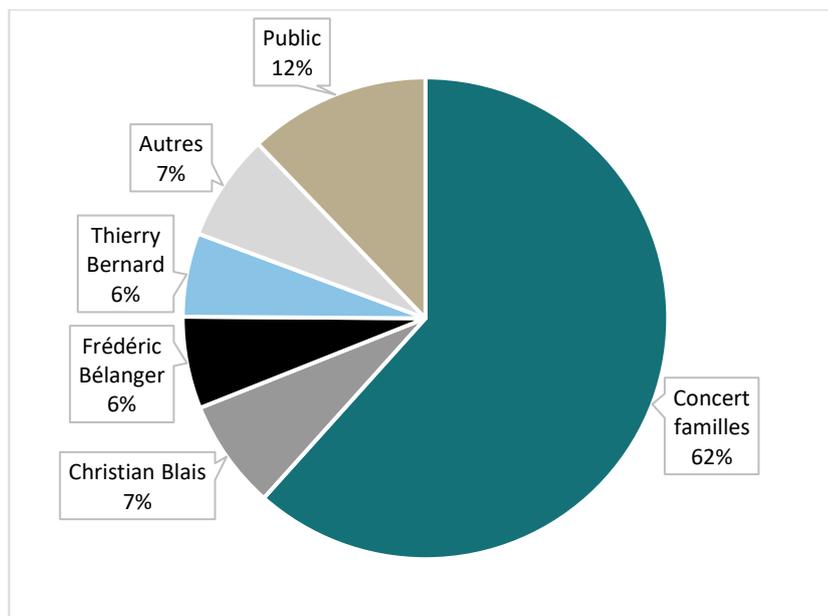
Perf Since IPO: +13.5%

Created in 2009, the group initially developed on the production of small wind turbines intended for the self-consumption market. Keeping this market as its target, it reoriented itself towards photovoltaics with bi-axial and then also bi-face panels.

With an estimated market share of 40% of the number of installations and 32% of the installed power by the end of 2021, the Group is currently the market leader in individual self-consumption of electricity on low-voltage professional sites in France and has installed, by the end of 2021, more than 2,000 trackers on over 1,500 sites in France. Its competition in this segment is fragmented, with multiple local installers and specialists in the installation of rooftop panels, such as Voltalia's subsidiaries Helexia and Cap Sud, which have signed PPAs with large corporations. Its technological particularity is to have developed dual-axis and dual-sided photovoltaic trackers designed to optimise energy production. The group claims to be 70% more efficient than fixed rooftop installations.

OKwind addresses three markets: farms (its panels have a small footprint because they are fixed to masts high enough to allow machinery and animals to pass through), industrialists/local authorities and, since 2020, private individuals. Its proposal is not limited to the supply of technology and continues throughout the life of the installation with an energy management service. Historically present on the farm market, the acceleration of its growth will come from industry, local authorities and private individuals. OKwind does not co-invest in installations.

Graph 24 OKwind shareholding



Source : Company



Recent activities

In June 2022, its IPO enabled it to raise €20M, which it intends to use 70% for its organic development and 30% for acquisitions of complementary technological bricks. Its objective for 2026 is to reach a turnover of €175M and a doubling of its EBITDA margin to around 20%.

On August 31, OKwind announced the signature of a partnership with Sofiprotéol, a subsidiary of the Avril group dedicated to the financing and development of the agricultural world, with the subscription of a €3M CB (4 years without BSA and unlisted) to accelerate its development.

Business and strategy

OKwind is distinguished by its high-tech photovoltaic offering, which enables it to add an energy management service to the simple supply/installation. Focused on self-consumption, the group has a significant track record of rapid and profitable growth that the IPO should help accelerate.

Key success factors

- Securing supplies of solar panels (China/Germany)
- Successfully ramp up the retail business, which is currently unprofitable
- Continue recruitment in a tight sector (131 FTEs, 35 of which will be recruited in 2021) and training of subcontractors

Energy price sensitivity

As with the whole sector, high prices improve the IRR of projects and therefore facilitate their commercialisation. However, OKwind's activity is not directly sensitive to energy price variations as it is not a producer yet and its customers do not sell their production to distributors. Trackers are not eligible for electricity buy-back and do not benefit from any subsidies.

Haffner Energy: hydrogen by thermolysis of biomass

Data (28/09/22)

2021/22 turnover: €0.4m

Target 25/26 turnover: €250m

Implied Sales CAGR: 405%

Capitalisation: €249m

EV/Sales 2021: 490.4x

EV/Sales 2024^e : 3.8x

Free float: 10%

IPO date: 15/02/2022

Perf Since IPO: -26.8%

Founded in the 1970s, the company has developed expertise in the energy treatment of biomass. As an engineering and project management company, Haffner (under the name Soten) has built more than 20 biomass cogeneration plants. Its R&D has enabled it to develop new solutions since the 2010s, in particular for the production of green hydrogen with HYNOCA from various biomasses by thermolysis.

Abandoning its historical business, Haffner Energy is betting on concentrating from 2022 on the production of green hydrogen by capitalising on the maturity of its technology, the industrial deployment of which began in Strasbourg with a unit launched in August 2019. The first industrial Hynoca unit was delivered in February 2021. The station should open for commercial hydrogen production in the first quarter of 2023. Once operational, the unit will produce up to 720 kg/day of H₂ synthesis gas called Hypergas.

Unlike other green hydrogen production processes, the particularity of HYNOCA is that it captures CO₂ in the form of biochar that can be used in industry and agriculture and generates carbon credits. Moreover, its production cost (provided that the price of biomass does not soar) is as competitive as, or even more competitive than, hydrogen from fossil fuels (steam reforming).

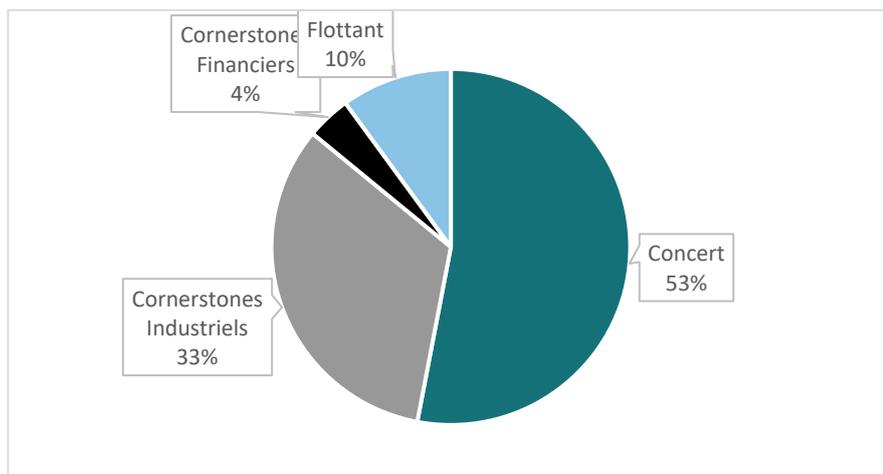
With 30 tonnes of biomass, Haffner claims to be able to produce 1t of H₂, 5.5t of biochar and thus capture 12t of CO₂. The process can also be diverted to produce syngas. By claiming an availability of its installations of more than 8000 h per year, the group compares very favourably with the load factors observed among the ENR.

Haffner's order book will amount to €33m by the end of 2021. Its development pipeline was around €183m at the time of the IPO, with 30% in mobility-related projects and 70% in industry. Based on this pipeline and the partnerships developed with major players such as HRS, Eren Energies and Vicat, the group has announced ambitious targets: it aims to achieve sales of €250m in 2025/26 and an EBITDA margin of 25%. Each project will be the subject of an SPV in which the group will take a minority share (around 10/15%).

The group's IPO took place on 15 February 2022 and raised a net amount of €59.3M, which will enable the group to cover a large part of its financing needs, estimated at €80M. Its three industrial partners each contributed €8 million.



Chart 25: Haffner Energy shareholding



Source: Company

Business and strategy

Haffner has developed a revolutionary decarbonisation technology for the production of hydrogen. Thanks to the financing raised at the time of its IPO, the group intends to deploy this solution in France and internationally, targeting mobility and industry. The group relies in particular on three solid partners: HRS, Eren Energies and Vicat.

Recent activities

On June 29, 2022 the company revised its 2022 turnover downwards to more than €25M vs. more than €30M due to the lack of availability of certain components, without this calling into question its medium/long term objectives.

Key success factors

- Recruitment of 360 employees for production and 100 for marketing
- Continued high level of investment in R&D
- Management of numerous small and medium-sized projects on a single technology
- Ability to source the necessary resources in a constrained environment
- Securing sufficient quantities of biomass without conflict of use with agricultural areas
- Ability to sell biochar in significant quantities through channels that have yet to be developed

Energy price sensitivity

The SPVs, in which Haffner will be a shareholder, will be subject to the variation in biomass prices, which will determine the cost price of hydrogen. The demand for hydrogen is expected to be exponential, which means that a sustained price level can be anticipated.

Hydrogène de France: a pioneer in hydrogen-electricity

Data (28/09/22)

2021 turnover: €0.9m

Target 25/26 turnover: €100m

Implied Sales CAGR: 226%

Capitalisation: €346m

EV/Sales 21: 285.7x

EV/Sales 24^e : 8.2x

Free float: 16%

IPO date: 24/06/2021

Perf since IPO: -21.8%

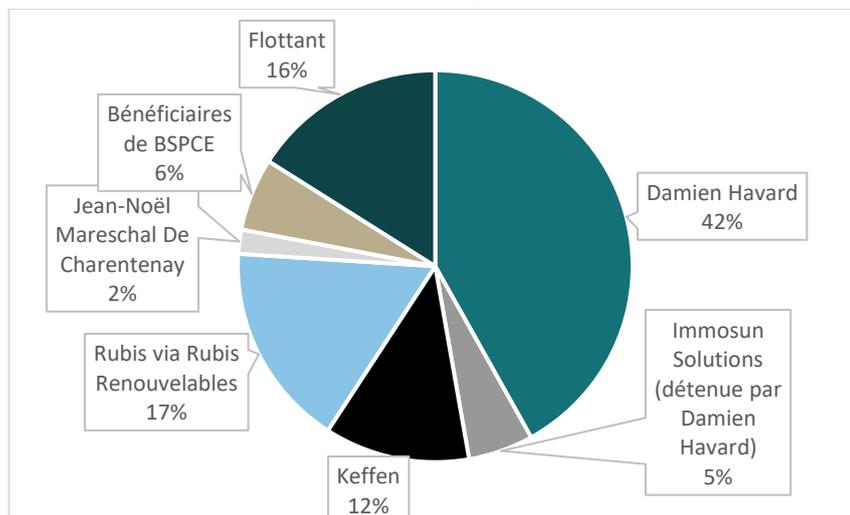
Founded in 2012, HDF Energy develops large capacity Hydrogen-Power plants and participates, through dedicated project companies, in their operation. The ambition of these projects is to allow the massive injection of renewable energy at high power levels (above 1 MW) into the grids while providing a solution to their intermittency. These plants will provide continuous or on-demand electricity from renewable energy sources (wind or solar), combined with high power fuel cells supplied by HDF Energy.

HdF is currently developing the CEOG project (in phase 3 of development), the world's largest renewable energy storage project using hydrogen to produce stable and competitive renewable electricity, supported by financial investors including Meridiam and SARA (Groupe Rubis).

The Power to Power project pipeline totals €1.3bn of investments in 11 different projects. To date, revenues have been generated exclusively from the billing of development services to the project SPVs. In the long term, the turnover will also come from the delivery of high power fuel cells to the SPVs carrying the projects in which HdF will have become a minority shareholder. In the longer term, the group will receive dividends as a minority shareholder in the SPVs, in proportion to its stake.

The IPO was carried out on 24 June 2021 via a capital increase of €115 million, of which €78.6 million was reserved for Rubis Renouvelables and €10 million for Téréga Solutions (via CBs).

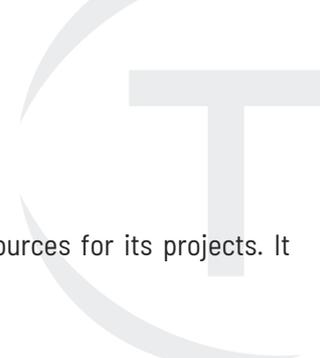
Chart 26: Hydrogen France shareholding



Source : Company

Recent activities

On 28 September 2022, the company published its half-year results. The turnover of €1.7M vs. €0.5M in H1 21 reflects the progress of developments on projects for which it is the prime contractor and minority shareholder. In line with its recruitment objectives, 17 new employees joined HDF during the half-year. With



a cash position of €94.2m, the group considers that it has the necessary resources for its projects. It evaluates its portfolio in prospecting at 1,939MW and 3,849MWh in storage.

Business and strategy

HDF Energy is developing two models of Hydrogen-Power plants:

- **Renewstable (Power-To-Power):** multi-megawatt power plants, producing stable electricity, consisting of an intermittent renewable source and a hydrogen chain including on-site energy storage;
- **HyPower (Gas-To-Power):** power plants producing electricity on demand from green or decarbonised hydrogen from transport networks.
- HDF Energy is integrating key fuel cell know-how, under a Memorandum of Understanding with Ballard (exclusive seven-year licence), and is developing the world's first mass production plant for high power fuel cells for energy in France (Bordeaux) which will be commissioned in 2023. Through this activity, HDF Energy will also serve the marine and data centre markets. HdF's strategy is to support the deployment of hydrogen infrastructure in parallel with the gradual decommissioning of traditional coal and gas power plants in Europe. In this context, the group has a target for the deployment of HyPowerR projects which would be achieved in 2 phases: 1/ deployment of 100 to 200 MW of fuel cells by 2025 with the objective of deploying between 1 and 3 projects per key European country (France, Belgium, Germany, Spain, Italy and the Netherlands); and 2/ reaching an installed capacity of 4 GW from 2030 onwards depending on the deployment of hydrogen infrastructures.

Key success factors

- Need for huge energy storage solutions as the intermittent nature of renewables leads to grid imbalance problems.

Integration of fuel cells as well as hydrogen tanks that ensure long-term and massive storage

- 1.3 billion Power to Power pipeline
- Capital and industrial partnership with Rubis in the projects that HDF is developing in Africa/Indian Ocean, the Caribbean and Europe. Rubis has already invested in two Renewstable plants developed by HDF in Guyana and Barbados
- Continuity of the licence granted by Ballard beyond the initial seven years

Energy price sensitivity

The electricity sales contract signed between the SPV and the grid operator is intended to be long-term (20 to 25 years). This contract can take two forms: 1/ Long-term power purchase agreements (PPAs), which allow the grid operator to buy continuous electricity directly from HdF and to ensure the financing of its assets thanks to a high level of visibility. This type of contract also allows the grid operator to have visibility on its price for the entire duration of the contract. 2/ capacity contracts allowing, thanks to hydrogen storage solutions, to supply electricity on demand. Hydrogen provides a reserve of power that can only be used in the event of a consumption peak or a network contingency.

La Française de l'Energie: multi-technology producer in short circuits

Data (28/09/22)

Turnover 2021/22: €26.2m

Target turnover 2026: >€100m

Implied Sales CAGR: 40%

Capitalisation: €239m

EV/Sales 2021: 10.1x

EV/Sales 24°: 3.7x

Free float: 64%

Date IPO: 13/06/2016

Perf since IPO: +82.9%

Born in Australia in 2007, the group quickly refocused on the acquisition, evaluation and exploitation of potential coal seam gas (CBM) and mine gas (CMM) deposits in Western Europe, and in particular in France, from 2007. The company was floated in 2016 with a €37.5m fundraising that enabled it to acquire Gazonor, which was created in 1991 to manage and exploit the disposal of coal seam gas following mining stoppages.

LFDE defines itself as a specialist in the establishment, via short circuits, of energy production and recovery sites. The group has exclusive rights to 1500km² of permits and concessions that allow it to use mine gas to produce electricity, gas and heat. Its certified reserves amount to 1,738 M m³ (+32MDm³ of contingent reserves). An additional 20-year concession was obtained in Belgium at the neighbouring Anderlues site (358 M m³ of certified reserves).

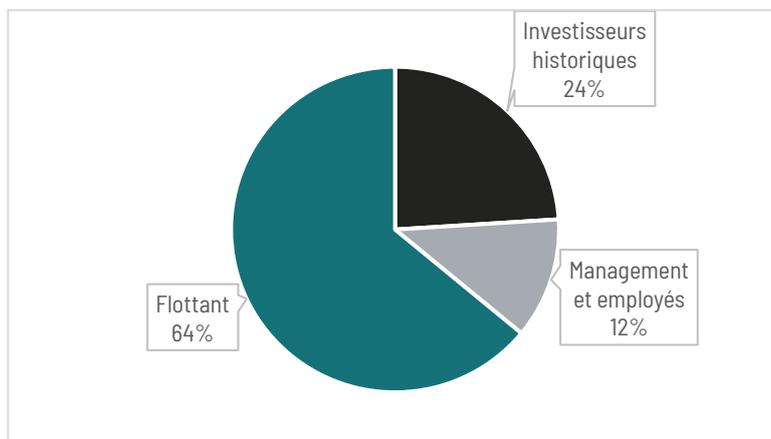
By capturing and developing this gas, which has 85 times the warming power of CO₂ (25 times on a century scale because methane decomposes more quickly than CO₂), the group has a negative carbon footprint. Its ambition is to avoid the emission of 10Mt Co₂ per year by 2026 (i.e. about 2% of French annual emissions) against 3.5Mt today. However, gas is still a fossil fuel and cannot therefore be considered a renewable energy. According to French regulations, it is a recovery energy that avoids pollution that would otherwise occur.

By capitalising on its local networks and its desire to promote short circuits, the group is developing one of the largest photovoltaic power plants in north-eastern France (15 MW in Moselle), which should be operational by the end of 2022.

Finally, in line with its focus on short circuits, in 2022 the group acquired Cryopur, a company whose technology makes it possible, in particular, to convert organic biomass into Bio-GNL and Bio-CO₂. Unlike traditional methanisation, which is aimed either at self-consumption or injection into the network, this technology makes it possible to produce a fuel that does not require connection to a network and whose process does not emit CO₂. The first large-scale installation was inaugurated in Norway in 2022. It will produce 8 tonnes of Bio-GNL and 10 tonnes of Bio-CO₂ per day from fish waste and manure.



Graph 27: La Française de l'Energie shareholding



Source : Company

Business and strategy

LFDE stands out from the rest of our sample by the multiplicity of technologies it masters and uses in short circuits. Previously focused on its mine gas concessions in France and Belgium, the acquisition of Cryopur offers the group the opportunity to expand in France and internationally. The group's ambition is to become a leading independent player in the energy sector in Europe.

LFDE owns its 15 active cogeneration plants. For its other activities, the group is setting up SPVs in which it intends to have a majority stake. Cryopur's activity, which was historically that of an equipment manufacturer, should also evolve towards the establishment of SPVs.

Recent activities

On 21 July 2022, the group published its annual turnover, which rose sharply (+156% to €26.2M) under the dual effect of the increase in gas (+8%) and electricity (+18%) production volumes and sales prices. On this occasion, LFDE updated its objectives for 2026:

- Avoid the emission of 10Mt CO2 per year (vs 3.5Mt)
- Turnover above €100m through organic growth / EBITDA above €50m

Key success factors

- With a small team (33 people), the group's growth will require the recruitment of both development and operational teams. Its model is based on significant subcontracting for construction and on fully automated plants that can be remotely controlled. The group intends to maintain a low level of fixed costs to optimise its operating leverage.
- Management of numerous small and medium-sized projects on multiple technologies.

Energy price sensitivity

Depending on its sites and contracts, LFDE's sensitivity to sales prices varies. Overall, it is very high, as the group benefits fully from the sharp rise in energy prices since 2021 at half of its cogeneration plants and renegotiates its tariffs on multi-year contracts, where it benefits from purchase obligations.

Lhyfe: hydrogen to decarbonise industry and mobility

Data (28/09/22)

2021 turnover: €0.2m

2026 turnover target: €200m

Implied Sales CAGR: 464%

Capitalisation: €384m

EV/sales²¹: 1120x

EV/sales^{24e}: 6.2x

Free float: 21%

IPO date: 25/05/22

Perf since IPO: -11.9%

Founded in 2017, Lhyfe is a producer and supplier of green hydrogen produced from renewable electricity for use in industry and mobility. The company develops and operates green hydrogen production sites through water electrolysis. Lhyfe positions itself as an independent producer of green hydrogen without being involved in the upstream (production of green electricity, equipment supplier) or downstream (distribution or use) parts.

The business model is similar to that of an independent renewable energy producer. Lhyfe buys renewable electricity and sells green hydrogen without taking price risk on long-term contracts and owning the asset. The asset is housed in an SPV which is financed by debt, equity and grants during the market take-off phase. The capex is high but generates a high and sustainable return (long-term contracts).

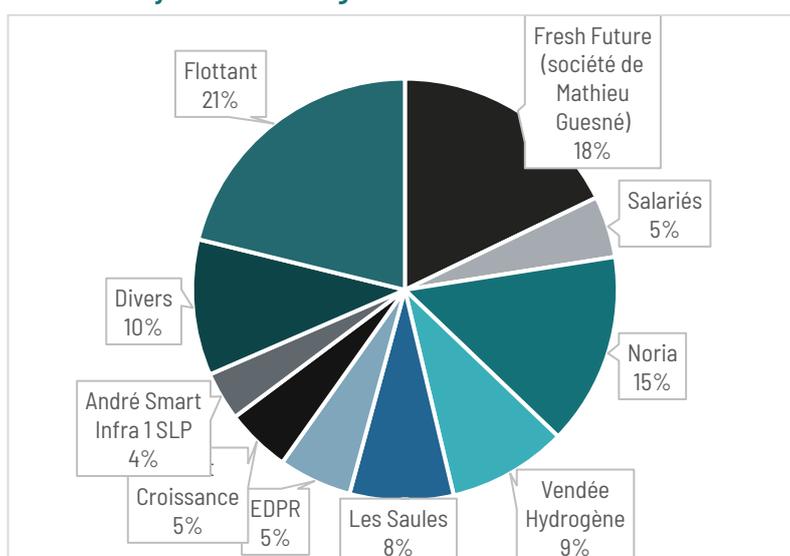
The strategy is based on a vertically integrated model. The company is responsible for the entire value chain from hydrogen production (design, construction, supplier selection, customer search, operation) to site selection. The company is totally agnostic on the choice of technologies (electrolyzers, compressors, purification units) which are mastered internally, as well as on the choice of renewable electricity source (solar, onshore and offshore wind, hydroelectricity or combination of energies).

Lhyfe already has a fully operational site in France (Bouin 300kg/d of green hydrogen produced from the site's wind turbines) and a commercial pipeline representing a production capacity of 4.8 GW (93 projects) across Europe (France, Germany, Denmark, Sweden, Portugal, etc.) for the industrial and mobility markets

The company expects to have 55 MW of installed capacity in 2024, 200 MW in 2026 and more than 3 GW in 2030, which will enable it to generate revenues of around EUR 200m in 2026 (break-even EBITDA) and more than 30% EBITDA margin in the long term.



Chart 28: Lhyfe shareholding



Source : Company

Business and strategy

The group produces green hydrogen and already has an onshore industrial unit in France, directly connected to a renewable energy source. Lhyfe benefits from the recognition of leading global partners to accelerate the deployment of production units: EDPR (EDP Renováveis), Mitsui, Plug Power, Wpd, etc

Recent activities

The IPO was carried out in mid-June 2022 via a capital increase of EUR 118.3m.

The publication of the half-yearly accounts on 21 September announced the tripling of the number of employees since the beginning of 2021, the strengthening of the commercial pipeline and the signing of partnerships with EDP Renewables and Mitsui.

Key success factors

- IPO gives impetus to development and will enable the deployment of numerous production sites for environmentally friendly and accessible hydrogen throughout Europe
- Positioned in a market that is expected to grow sixfold between 2020 and 2050
- Lhyfe has one of the most advanced project portfolios in Europe (93 projects or 4.8 GW of total installed capacity, representing a production of more than 1,620 tonnes/day)

Energy price sensitivity

Lhyfe is not sensitive to the wholesale price of electricity and benefits from pass through contracts negotiated on a medium and long term basis which offer strong visibility to the turnover.

Neoen: French independent leader in renewable energy production

Data (28/09/22)

2021 sales: €333.6m	2026 sales target: ND	Consensus sales CAGR: +24%
Capitalisation: €3.6bn	EV/Sales 21: 19.6x	EV/Sales 24^e: 10.4x
Free float: 40.7%	IPO date: 17/10/18	Perf since IPO: +117.4%

Created in 2008, Neoen is the leading French independent producer of renewable energy. The group is active in 16 countries. The group is based on a "develop to own" business model and owns more than 92% of its assets. Neoen operates for its own account on a long-term basis. The group currently has 5.6 GW of capacity in operation and under construction and is aiming for more than 10 GW of target power by 2025. Neoen's main activity is solar power (historical), followed by wind power, for which the group is developing projects in France, Australia, Finland, Ireland and Sweden, and finally storage, for which the group has the necessary resources. The Victorian Big Battery, commissioned at the end of 2021 and with a capacity of 300 MW / 450 MWh, is one of the most powerful lithium-ion battery storage units in the world.

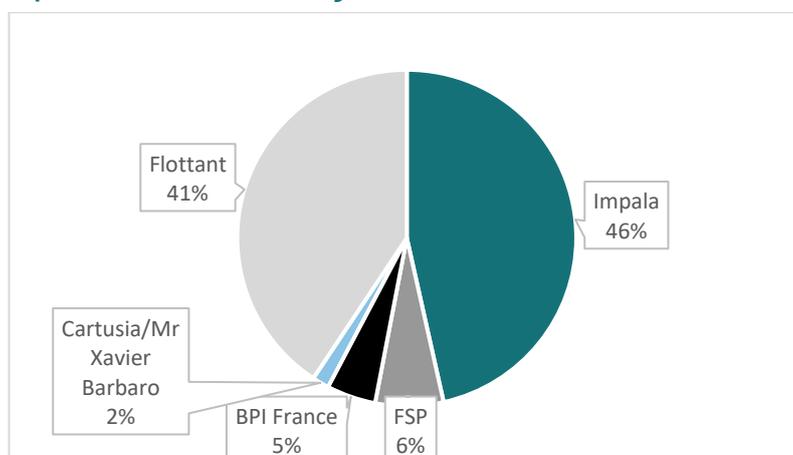
The group has been profitable since 2011 and has achieved an EBITDA of €300m by 2021.

For 2022, the group expects to achieve an adjusted EBITDA of between €380 and €400 million with an adjusted EBITDA margin of between 80 and 90%. These targets are based on a favourable market price environment, the rate of progress of projects under construction and dynamic activity in Q2 (+36% driven by the storage business which more than tripled, particularly in Australia - Victorian Big Battery). Neoen also confirms its objective of generating double-digit annual growth in adjusted EBITDA between 2022 and 2025.

Neoen has no immediate comparable in the French universe of renewable energy companies. It is an interesting proxy for small listed companies whose 4 or 5 year objectives would bring them close to Neoen in 2020/2021 in terms of turnover. However, Neoen is the only company to have a mainly "develop to own" model, which undoubtedly allows it to show a profitability much higher than that of its smaller competitors.

The group has been listed since October 2018.

Graph 29: Neoen shareholding



Source : Company



Business and strategy

With more than 300 employees, Neoen's strategy is based on a technology mix including solar, wind and storage. The group has won nearly 900 MW of new projects in Australia, Europe and the Americas by 2021. Neoen has distinguished itself by twice winning government tenders in France and by launching the construction of two wind power assets of more than 400 MW in Finland and Australia, which are intended to be multi-client platforms.

Recent activities

On 28 July, Neoen published a strong increase in its half-year results, with sales of €224 million (+36%) and EBITDA of €175 million (+39%), enabling it to raise its EBITDA margin target to between 80% and 90% by 2022.

Key success factors

- Secured portfolio of 6.3 GW as of 30 June 2022. New awarded projects represent 242 MW (92.5 MWp won in France, 80 MWp won in Ireland; 57.4 MW corresponding to the Storbrännkullen wind farm in Sweden; and 5.3 MW of additional capacity in Finland). The total portfolio stands at 17.3 GW at the end of June 2022 compared to 13.9 GW.
- A model that consists of retaining control of the assets and being the majority shareholder, which offers a significant competitive advantage in tenders. It allows the company to capture the long-term value of the plants and benefit from their repowering potential.
- A €600m capital increase to finance the first investment cycle of the development plan to reach 10 GW of capacity in operation or under construction by the end of 2025
- Selective development in new countries (OECD), which will continue to represent at least 80% of operational capacity.

Energy price sensitivity

The vast majority of Neoen's contracts are take-or-pay and do not involve any volume risk, since the commitment is for a price per MWh, regardless of the volume injected into the grid. The sales contracts are not indexed to electricity, oil or gas prices, but can be fully or partially indexed to inflation. The typology of contracts corresponds to: power sales contracts won through tenders, concluded for a period of 10, 15, 20 or 25 years and usually for a given capacity of electricity at a given price; or over-the-counter contracts with buyers such as energy companies or private companies with specific energy needs. These contracts are usually for a fixed amount of capacity at contractually defined prices. They have a shorter duration than contracts with public or parastatal purchasers or private electricity distribution companies, typically 10 to 15 years for wind and solar, and 7 to 15 years for batteries.

Voltalia: the most international

Data (28/09/22)

2021 SALES: €461m	2026 sales target: ND	Implied sales CAGR (consensus): +9%
Capitalisation: €1.7bn	EV/Sales 21: 5.5x	EV/Sales 24^e: 4.3x
Free float: 25%	IPO date: 8/05/06	Perf since IPO: -44.6%

Founded in 2005, Voltalia is both an independent energy producer from its own wind, solar, hydro, biomass and storage plants and a service provider for third party clients.

As of 28 September 2022, Voltalia had an installed capacity of 1.4 GW, with a further 0.9 GW under construction. In addition to its own power plants, it operates 4.5 GW on behalf of third parties.

The group has a portfolio of projects under development representing a total capacity of 13.6 GW. At the end of July 2022, the group had 2.1 GW of capacity in operation and under construction (+42% vs. H1 2021) with more than 0.9 GW under construction (88% of which is solar).

After a very partial IPO in July 2014, Voltalia was transferred to the Euronext regulated market via a €100M capital increase in late 2016. Créadev (Mulliez family) contributed €87.5M and €15M was invested by Proparco.

Business and strategy

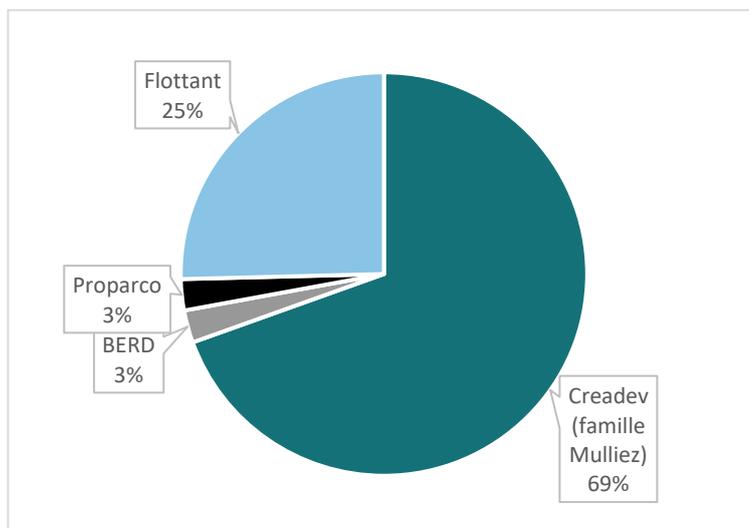
With 1300 employees at the end of 2021, the group is present in 20 countries on 4 continents. Voltalia generates 55% of its turnover from wind energy, 40% from solar energy and 5% from biomass, hydro and storage. Voltalia is mainly present in Latin America (51% of turnover), in Europe for 35% and in the rest of the world including Africa for 14%. Its geographical mix, historically oriented towards Latin America, is currently being rebalanced in favour of Europe.

The business model focuses on the production of electricity at a competitive price. Long-term electricity sales contracts, indexed to inflation, provide significant visibility on cash flows over time: with the electricity sales contracts signed, Voltalia has a portfolio with a total of €6.6 billion in future contracted revenues.

In 2022, contracts linking a renewable energy producer directly to its customer continued to grow both in countries where renewable energy is not subsidised and in countries where support mechanisms are still in place. Voltalia has signed more than 953 MW of CPPAs (direct renewable electricity purchase agreements between renewable electricity producers and companies) since mid-2019. These contracts, which have an average duration of 18 years, were mainly signed in Brazil and Europe.



Graph 30: Voltalia's shareholding structure



Source: Company

Recent activities

On 20 July, Voltalia reported a 31% increase in half-year sales at constant exchange rates to €209 million. On 28 September, the group published its half-year results with a strong increase in EBITDA of +39%. It announced that it had reached its capacity target of 2.6GW by the end of 2022 vs. 2023, one year ahead of schedule.

Key success factors

- An energy mix that offers a high degree of resource predictability thanks to the diversity of energy sources
- Contracts with a residual duration of almost 18 years
- 83% of income is indexed to inflation under PPP
- Voltalia has 2.4 GW of capacity in operation or under construction in September 2022.
- A differentiating asset: the complementary nature of the businesses of renewable electricity producer and service provider for its own account and for third parties
- The Services business, which is not very capital intensive, is a visible growth lever this year (55% of turnover)

Energy price sensitivity

88% of Voltalia's portfolio, including electricity, is sold at non-subsidised prices. Generation can be sold through feed-in tariffs, tender prices, as part of direct sales on the open market or directly sold to end customers through a CPPA. These direct renewable electricity purchase contracts provide long-term price visibility for the customer and diversify the purchase portfolio. The price generally includes guarantees of origin associated with the generation as well as capacity guarantees.

Waga Energy: recovery of methane from landfills

Data (28/09/22)

2021 turnover: €12.3m	2026 turnover target: €200m	Implied sales CAGR: 75%
Capitalisation: €616m	EV/AC 21: 40x	EV/AC 24^e: 7.5x
Free float: 24.6%	IPO date: 27/10/2021	Perf since IPO: +15.3%

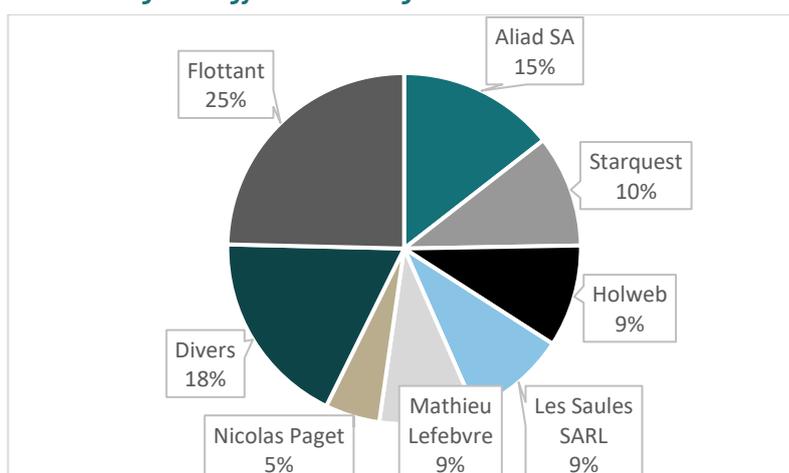
Created in 2015 on the initiative of three engineers from the Air Liquide group, Waga Energy recovers biogas from landfill sites in the form of biomethane, a renewable substitute for natural gas.

The purification units (Wagaboxes) guarantee high quality biomethane (the main component of natural gas), regardless of the quality of the raw biogas. This can be injected directly into the gas distribution networks (after purification) or used as fuel for vehicles. Waga offers a solution for purifying biogas from landfill sites and paves the way for the exploitation of a new source of renewable gas. French landfill sites could supply 2.4 Twh/year of biomethane by 2023 (source: Ademe), equivalent to the gas consumption of a city like Lyon.

Waga Energy finances, builds and operates the Wagaboxes under long-term contracts with waste operators, and shares the revenues from the sale of the biomethane with them. As of 31 July 2021, Waga Energy was operating ten Wagabox units in France with a maximum installed capacity of 225 GWh/year. By the end of 2026, Waga aims to have 100 Wagabox units in operation, i.e. 90 additional units compared to the situation at the time of the IPO, and 120 projects by the end of 2026 (of which 100 units in operation and 20 units committed and under construction), representing nearly €400M in turnover. The group is relying on a pipeline of 98 sites for which negotiations are underway and on the 324 sites for which studies and discussions are underway (validation of project feasibility). To reach this objective and the deployment of the additional Wagabox units, Waga is targeting an EBITDA margin of between 30% and 50% for a "typical" project (i.e. 1,500m³/h).

The IPO was carried out on 21 October 2021 via a capital increase of €124 million.

Chart 31: Waga Energy shareholding



Source : Company



Business and strategy

With a staff of 79 (end 2021), Waga Energy develops biomethane projects, integrating all the skills needed to carry out biomethane injection projects from a landfill site: financing, design, construction, commissioning, operation, maintenance and sale of biomethane. Today, Waga operates 13 Wagabox units in France, representing an installed capacity of 480 GWh/year. 12 units are under construction in France, Spain, Canada and the United States.

Recent activities

In the first months of 2022 in France, Waga started up 3 new units including a large capacity unit (120 GWh/year) and signed 3 new contracts, two in France and one in Canada.

At the end of April, Waga estimated that its annual recurring and contracted turnover will be around €40M, compared to €30M at the time of its IPO.

In mid-July, Waga signed its first contract with Séché Environnement to produce biomethane. Séché Environnement has about fifty sites in France and is present in 15 countries.

Key success factors

- A very large market: 1/ a technology capable of cleaning the gas from the majority of the world's landfills, 2/ in developed countries most waste is collected for storage in landfills, and 3/ landfills continue to emit methane for many years after they are closed
- Ability to sell biomethane at a competitive price, on a market basis (grid parity)
- An international deployment strategy, 98% of the potential market is international
- Partnerships and business links with major global waste management companies (Veolia and Suez in France, Ferrovial Servicios in Spain, as well as national private and public players such as Paprec in France and Enercycle in Canada)

Energy price sensitivity

Waga is primarily targeting countries with support mechanisms for biomethane injection, but it is also deploying its solution in countries without support mechanisms (e.g. Spain).

Waga's sensitivity to the price of natural gas is relatively low during the operation phase but high during the development phase. Indeed, the realisation of a project in one of these countries is based on the conclusion of a long-term biomethane sales contract with an energy company or a private operator, which implies being able to produce biomethane at a price deemed acceptable by a buyer.

Risk of conflicts of interest

Nature	
Consulting contracts of any kind	No
Research contract	No
Equity investment by Theia Recherche or the author of the study	No
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Other	No

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