Sectoral Analysis

January 2023

CROSS CHANNEL INSTITUTE

for the promotion of Franco - British sustainable properity

The Energy Transition

Business Challenges and Opportunities in France and the UK

FRANCO BRITISH Chamber

British Embassy Paris

Table of Contents

I. Introduction.

II. Energy Policies in France and the UK.

- Primary Energy Consumption
- CO_2 emissions from Energy
- Short Term – Ensuring Energy Security through the Winter
- Longer Term – Supporting the Energy Transition

III. The Energy Transition to Net Zero

- What is the Energy Transition and how can it be achieved?
- Nuclear – why this is important for France and the UK
- Natural Gas – the transition fuel
- Biofuels – from waste to energy
- Renewables – harnessing the power of the sun and wind
- Batteries – Energy Storage Systems (BESS)
- Hydrogen – the key to Net Zero

IV. The Energy Transition for different Business Sectors

- Aviation – Ardian
- Transport – Sterne
- Industrial Machines – JCB

V. From our members' Point of View: Energy Transition Challenges and Opportunities

- BP
- Schneider Electric
- Lhyfe

VI. Conclusion

I. Introduction

When Rishi Sunak, Prime Minister of the UK, and Emmanuel Macron, President of France, met during the COP27 in Egypt, they agreed on **the importance of continuing to drive climate action forward** and noted opportunities for the UK and France to collaborate further on the transition to clean energy, including on nuclear power.

The energy transition is fundamental to achieving the **Paris Agreement** to limit global warming to well below 2°C and preferably to 1.5°C, compared to pre-industrial levels, by reducing greenhouse gas (GHG) emissions and achieve a climate neutral world (net zero) by 2050.

Energy use represents close to three quarters of global greenhouse gas emissions, of which industry, transport, and buildings are the three main sources. Decarbonizing these sectors, replacing fossil fuels with low carbon energy sources represents a structural change, requiring long-term strategies and investment to achieve net zero targets.

However, the challenge of the energy transition has been compounded by the **steep rise in global energy prices since 2021.** This has been caused by greater fuel and power demand as economies recover from Covid-19. Russia's attack on Ukraine since February 2022, has greatly exacerbated the situation. In 2021, a quarter of all energy consumed in the EU came from Russia. The imposition of sanctions by the USA and the EU has meant that alternative energy sources have been sought – most notably via importations of liquified natural gas (LNG). This drove gas prices to an all-time high over the summer, reaching €300 per MWh, and while prices have since dropped back, discussions are underway to establish a pricing mechanism to prevent such volatility.

An additional strain to the energy market in France and Europe has been the lower availability of nuclear power due to investigations and repairs relating to stress corrosion indications. Historically low hydropower conditions also caused a drop in hydroelectric power.

The high energy prices are having a direct impact on people and businesses, still heavily reliant on fossil fuels, driving inflation and creating severe strains on the cost of living. On the one hand this is putting pressure on governments to implement **short-term actions** to soften the full impact, on the other hand, while it may be tempting to finance this through the postponement of long-term, structural investments to advance the energy transition, it **highlights the importance of the transition away from fossil fuels** to establish reliable, affordable, and sustainable energy supplies.

In this study, we take a look at both the short-term and long-term responses to the energy transition in France and the UK. We consider the low-carbon energies of the future, as well as the energy transition challenges and opportunities facing businesses and different business sectors.

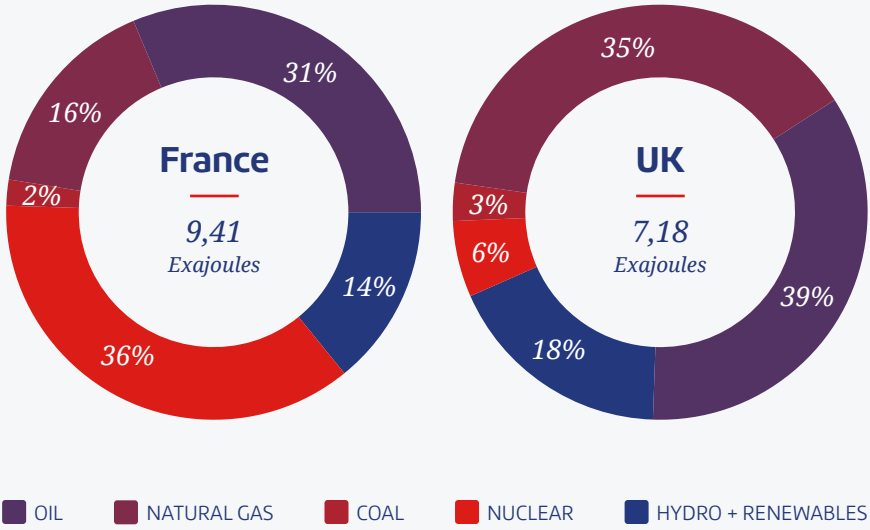
One thing is clear, both countries need to collaborate to drive climate action forward!

II. Energy policies in France and the UK

France has 30% higher energy consumption than the UK

When comparing the energy policies of France and the UK it is important to look at their energy profile. The charts below show that France relies on a high proportion of nuclear energy, with 56 nuclear reactors, making up 36% of primary energy consumption. In the UK, oil and gas make up 73% of primary energy, thanks in large part to its North Sea resources. With strong growth in renewables, which make up 18%, the UK has one of the highest shares of renewable energy in Europe.

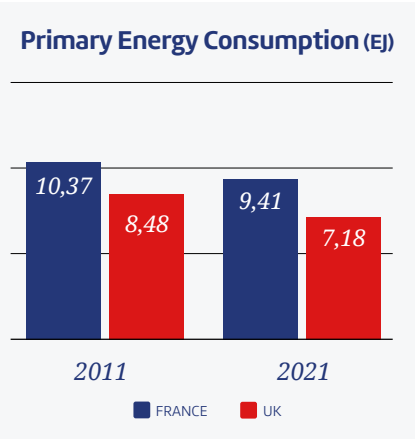
PRIMARY ENERGY CONSUMPTION 2021

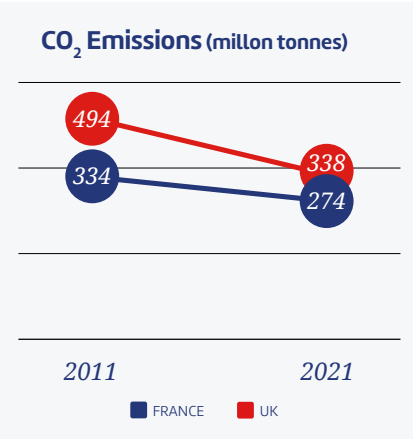


Source: BP Statistical Review of World Energy 2022

France has lower CO_2 emissions, but the UK has stronger growth in renewables

The differences in the primary energy profile are reflected in the total CO_2 emissions. While France has lower CO_2 emissions and higher energy consumption, the UK has seen a greater reduction in CO_2 emissions over the last 10 years due to an important decrease in the use of coal and strong growth in renewables.





Source: BP Statistical Review of World Energy 2022

Ensuring energy security through the winter is the immediate challenge

In the short term, guaranteeing energy supply and its security through the winter is at the top of the agenda for both governments. While neither France nor the UK have been dependent on direct supplies of Russian gas, both countries are impacted by the effect that sanctions have had on international gas prices, which is a key fuel used for heating and power generation. The scramble to purchase alternative sources of gas to avoid winter supply shortages caused gas prices to skyrocket during the summer. The lower availability of nuclear power in France and for export to the UK placed additional strain on the power networks, but the UK saw a record amount of electricity generated from renewables. Both countries introduced short-term measures to counter the impacts of the energy crisis, as summarized in the table below :

FRANCE

Rate cap or "bouclier tarifaire" introduced in October 2021, and extended to end of 2022, **caping electricity price rises at 4%.** From 2023, **gas and electricity price increases will be capped to 15%.**

Government funded fuel price reduction of petrol during the summer supported by price reductions by **Total Energies during August and September extended to the end of 2022.** Fuel-price discounts in the form of energy cheques.

One-off payments of €100 or €200 to around 1.6 million low-income households from Nov 2022 to help with energy bills. More targeted help will be provided from Jan 2023.

UK

Energy Price Guarantee limits the average energy bill for a typical household to an annual equivalent of £2,500, **saving around £900** this winter, based on what energy prices would have been under the current price cap. This will be **extended to run from April 2023 to April 2024**, limiting the average energy bill to £3,000 in 2023.

Energy bills support scheme provides a £400 discount to eligible households from October 2022 to March 2023.

FRANCE Businesses

Direct support for businesses, with support limited at 80% of losses.

Cities, businesses and households are **encouraged to implement energy saving measures** such as limiting indoor heating temperatures to 19°C and reducing lighting at night.
EcoWatt provides real-time alerts of the risk of power cuts.

UK Businesses

The **Energy bill relief scheme** is a 6-month scheme for businesses. After this period, the government will provide focused support for vulnerable industries.

The UK has also extended the **Energy Intensive Industries (EII) Compensation Scheme** for a further three years.

The **Energy profit levy** on Oil & Gas companies will be increased from 25% to 35% and a temporary tax of 45% will be applied to electricity producers from January 2023.

Major investment plans to reach to Net Zero by 2050

In the longer term, both governments have made a commitment to be **Net Zero by 2050**, and to achieve energy autonomy. Many parallels can be drawn between the two countries and their long-term energy strategies, such as the emphasis on renewables and nuclear.

France

France has some of the world's most ambitious net zero targets, with a heavy emphasis placed on nuclear energy, as well as a bold hydrogen agenda. The government's low carbon strategy is not limited to energy; it covers agriculture and industry as well. In September 2020, the government announced a massive investment plan, **France Relance 2030**, covering ecology, competitiveness, and cohesion.

This is in parallel to the European program **Fit for 55**, which makes the EU climate goal of reducing emissions by 55% by 2030 a legal obligation, and the **REPpowerEU** scheme set up in response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine.

UK

The UK government is equally ambitious in its decarbonisation targets and is a leading economy in this regard. Ahead of COP26, which the UK hosted in Glasgow in November 2021, the government lunched its Net Zero: Build Back Greener strategy, setting out its **10 point plan for a Green Industrial Revolution.**

These long-term strategies are summarized in the table below:

France Relance Recovery Plan 2030

September 2020

A massive €100 billion investment plan, with €40 billion provided by the EU, covering ecology, competitiveness, and cohesion.

Ecology

- Developing **green hydrogen** to be at the cutting-edge of hydrogen production and low carbon technologies and support industrialization.
- **Improving everyday mobility** to develop the use of bicycles and public transport and improve the quality of the rail network.
- **Biodiversity,** fighting against land take and agricultural transition to meet the increased demand for local produce.

Competitiveness

- **Reshoring industrial production** for 5 strategic sectors; health, inputs, electronics, agrifood industry, industrial 5G applications.
- Investing in future technologies including digital technologies, **carbon free energies, sustainable transport and mobility**
- Lower production taxes.

UK Ten Point Plan for a Green Industrial Revolution

November 2020

The plan will mobilise £12 billion of government investment and potentially 3 times as much from the private sector, to create and support up to 250,000 green jobs.

1. Advancing offshore wind

- 11GW already generated and another 12GW in the pipeline

2. Driving growth of low carbon hydrogen

- Including ITM's Gigastack Project
- £240 million Net Zero Hydrogen fund

3. Delivering new and advanced nuclear power

- Pursuing the Sizewell C project
- Rolls Royce developing Small Modular Reactors

4. Accelerating shift to zero emission vehicles

- 2 new gigafactories to produce batteries
- End sales of new petrol and diesel cars and vans by 2030
- Roll out EV charging infrastructure.

5. Green public transport, cycling & walking

- Invest in rail and zero emission bus networks, build cycle lanes and create low-traffic neighbourhoods

France Relance Recovery Plan 2030
September 2020

Cohesion

- To **strengthen skills** and transform vocational training to make France a leader in the area of **digital technology and educational innovation**
- Training young people in strategic high-growth sectors

UK Ten Point Plan for a Green Industrial Revolution
November 2020

6. Jet zero and green ships

- Drive the uptake of sustainable aviation fuels (SAF) and develop infrastructure of future airports and seaports.
- Clean Maritime Demonstration Program to develop clean maritime technology.

7. Greener buildings

- Promote household insulation and heat pump installation.

8. Investing in CCUS (carbon capture)

- Decarbonize industrial clusters including Teesside, the Humber and Merseyside.

9. Protecting the natural environment

- Nature for Climate Fund to combat biodiversity loss and adapt to climate change.

10. Green Finance & Innovation

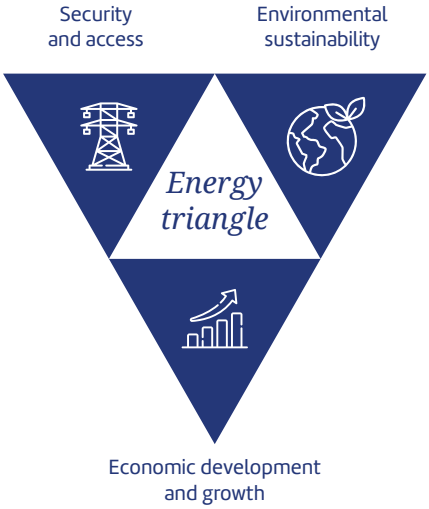
- Creation of Net Zero Innovation Portfolio .

III. The Energy Transition to Net Zero

What is the energy transition and how can it be achieved?

The energy transition implies a significant structural shift in the sources of energy that satisfy global energy demand. This requires a reinvention of the way we live; to transition from a fossil-fuel-based system of production and consumption to carbon-free renewable energy sources and electrification.

But the energy transition is about more than decarbonization. Economic prosperity is deeply dependent on access to energy. Although the energy transition is mainly driven by environmental sustainability concerns, it will only succeed if it simultaneously provides energy security and access to facilitate economic growth and development. In other words, a successful energy transition needs to balance the energy triangle – security and access, environmental sustainability, and economic development and growth.



It is an extremely complex challenge. Today's energy crisis reveals how fragile this balance is. Russia's invasion of Ukraine and its weaponization of energy is causing economic pain across the world, but this must not thwart global efforts to combat climate change. Indeed, it underlines the criticality of the energy transition.

There is an urgent need for **increased investment and accelerated project development** in low-to-zero carbon solutions. In this section we consider the different low-carbon energy solutions and their deployment in France and the UK.

Source: World Economic Forum: Energy Transition 101: Getting back to basics for transitioning to a low-carbon economy – July 2020

Nuclear power – why this is important for France and the UK

Nuclear power is an important low-emission source of electricity, providing reliable baseload power at scale. But in the last decade, nuclear power capacity has declined as the addition of new capacity has been unable to compensate for the retirement of aging plants. Today it represents around 10% of global electricity generation. Both France and the UK are committed to maintaining and investing in new nuclear power.

France

56 Nuclear reactors in operation

1 EPR under construction, Flamanville, Normandy

67 % of electricity generation in 2021

Under the new energy strategy published in 2022, the government reconfirmed its commitment to developing nuclear power and will **extend the lifetime of all reactors** that are currently in service beyond 50 years. It plans to **build six EPR2** between now and 2050. In terms of employment, this will preserve 220,000 jobs for many years and create tens of thousands of new jobs.

Within the France Relance 2030 program, the government has earmarked **€1 billion of financing** for the development of new, smaller reactors, split equally between the NEWARD project to build small modular reactors (SMR) and the development of innovative new reactors producing lower waste.

Furthermore, in response to the energy crisis and to ensure France's energy independence, in November 2022, the French government completed the acquisition of the outstanding shares of EDF for €9.7 billion. Placing EDF under full state control will enable it to commit to long-term projects.

UK

11 Nuclear reactors in operation (operated by EDF Energy)

1 EPR under construction, Hinkley Point C, Somerset

15 % of electricity generation in 2021

The UK government strategy will see a significant acceleration of nuclear, with an ambition to reach up to **24GW by 2050**, representing around **25%** of projected electricity demand. The government is committed to building the first new power station at Hinkley Point C in Somerset, which will provide 3.2GW of electricity, and the Sizewell C project, which is a replica of Hinkley Point C will also be approved.

Subject to technology readiness from industry, small modular reactors (SMR) will form a key part of the nuclear project pipeline. The Advanced Nuclear Fund – includes £120m for Rolls-Royce to develop the design for one of the world's first SMRs which could be deployed in the UK in the early 2030s.

Natural Gas – a fossil fuel for the energy transition

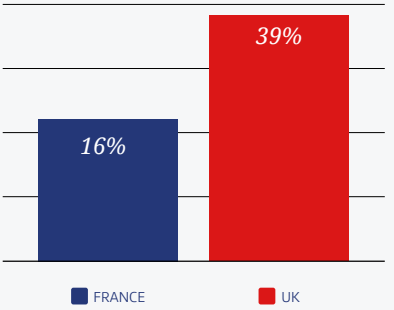
Natural gas is one of the mainstays of global energy, making up almost a quarter of primary energy. When natural gas replaces more polluting fossil fuels, such as coal, it improves air quality and limits emissions of CO_2. Analysis which considers both CO_2 and methane emissions has shown that compared to using coal, on average, emissions are 50% lower when producing electricity and 33% lower when providing heat. The IEA estimates that between 2010 - 2019, coal-to-gas switching saved around 500 million tons of CO_2 globally. This is one of the reasons why natural gas can be viewed as a transition fuel.

Natural gas can be used to fuel flexible power plants which facilitate the integration of renewable energy to power grids. Unlike traditional baseload power plants, which operate most efficiently when generating a consistent and stable level of power, flexible power plants can be switched on and ramped up or down quickly in response to fluctuations in renewable energy supply. In this way, they provide a balancing mechanism to support power grids.

However, unlike oil and coal, transportation of gas by pipeline or shipped as LNG (liquefied natural gas) represents a relatively high share of the cost. Geographical proximity to resource rich areas is an important factor and is reflected in the significant regional price differences. European reliance on low-cost gas from Russia was exposed by the Russian invasion of Ukraine. The imposed sanctions and the search for alternative supplies (pipeline and LNG) sent natural gas prices skyrocketing; in 2022 prices quadrupled in Europe, tripled in Asia, and doubled in the USA.

Carbon capture, utilization, and storage (CCUS) technologies, which capture the carbon during the refining process, is being promoted as a solution to reduce CO_2 emissions from natural gas. The key issue is cost. To reach Net Zero targets, approx. **1.6 GT** per year of carbon capture needs to be installed by 2030, around **40x** current capacity. **The EU Emissions Trading Scheme** (ETS) is intended to incentivize investment, to scale up technology and bring down costs.

Gas as % of Energy Consumption



France

Natural gas represents **16%** of the primary energy source in France. As part of the REPowerEU program, to coordinate and reduce European dependency on Russian oil and gas and prepare for winter requirements, France increased gas storage during the summer. France has several liquified natural gas (LNG) facilities enabling it to import LNG.

UK

Natural gas provides **39%** of the primary energy source in the UK, primarily from the North Sea.

As part of the Energy Strategy Ten-Point-Plan, the government has committed £1 billion to decarbonize industrial clusters and has announced the first clusters in Teesside, the Humber and Merseyside.

Biofuels
Producing energy from waste

Biofuels are liquid, solid or gaseous fuels produced from the conversion of biomass. The most common biofuels are **bioethanol**, produced from sugar cane or corn, charcoal or woodchips, **biodiesel**, which is the most common biofuel in Europe, produced from oils or fats, and **biomethane** produced from the anaerobic decomposition of wastes. They are mainly used as additives or complements to fossil fuels. In the context of global warming, biofuels represent an alternative and renewable energy source.

Demand for biofuels is set to grow, but production must be achieved sustainably and avoid negative impacts on biodiversity, freshwater systems, food prices and availability. Every litre of biofuels used must reduce emissions relative to fossil fuels as much as possible.

Sustainable Aviation Fuel (SAF)

SAF is produced from sustainable feedstocks and is very similar in its chemistry to traditional fossil jet fuel. It can be blended up to 50% with traditional aviation fuel and is subject to the same quality tests. Using SAF results in a reduction in carbon emissions of up to 80% compared to the traditional jet fuel it replaces over the lifecycle of the fuel. Some typical feedstocks include cooking oil and other non-palm waste oils from animals or plants; solid waste from homes and businesses, such as packaging, paper, textiles, and food scraps that would otherwise go to landfill or incineration. Other potential sources include forestry waste, such as waste wood, and energy crops, including fast growing plants and algae.

France

France is the **4th largest producer of biofuels in the world** after the US, Brazil and Germany producing more than 2 million tonnes per year. In 2017, the development of biofuels was incorporated in its Green Growth Engagement (l'Engagement pour la Croissance Verte). France has brought together 5 industrial companies; Air France, Airbus, Safran, Total and Suez to develop sustainable aviation fuels with the objective of replacing kerosene with SAF by 2% in 2025, 5% in 2030, to reach 50% by 2050.

Conventional biofuels are currently blended to make up around 8% of the composition of diesel and petrol.

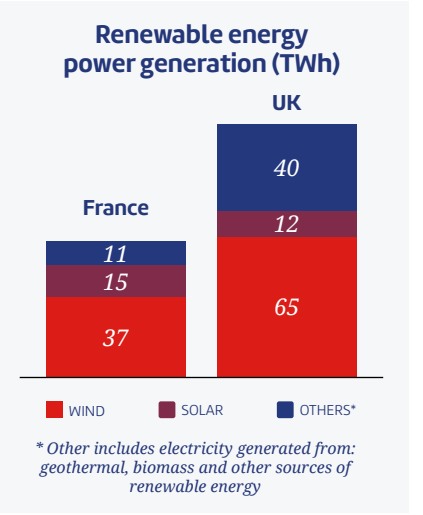
UK

In the UK, Jet fuel suppliers are required to blend an increasing proportion of SAF into aviation fuel from 2025.

Renewables – harnessing the power of the sun and wind

The global energy crisis has sparked unprecedented momentum for renewables. Fossil fuel disruptions have underlined the energy security benefits of domestically generated renewable electricity. Moreover, higher fossil fuel prices have improved the competitiveness of solar PV and wind generation.

The International Energy Agency (IEA) expects renewables to become the largest source of global electricity generation by early 2025, surpassing coal. Renewable capacity expansion in the next five years will be much faster than previously expected.



Renewable energy generation in 2021

In 2021, renewables provided 63 terawatt-hours of electricity generation in France, representing **11%** of total electricity production. In the UK, renewables provide almost double at 117 terawatt-hours, making up **38%** of total electricity production.

France

Under the France Relance 2030 plan, the government is committed to the massive development of renewable energies and has set the following targets:

- **Solar PV** – to increase production capacity tenfold X10 to exceed 100 GW by 2050. The senate recently adopted a law to impose the installation of solar panels to cover outdoor car parks of more than 80 places with the aim to stimulate development of solar PV
- **Offshore wind** – the creation of 50 offshore wind parks, to generate 40 GW by 2050 – the first offshore wind park is scheduled to come online in the coming months
- **Onshore wind** – to double capacity by 2050 (versus 2030 in previous plan) progressively from 18GW per year today – mayors will have the ability to decide where wind turbines can be installed and will be able to benefit from tax advantages.

UK

The UK is committed to **advancing offshore wind**, investing over £1.6 billion and securing 3,600 jobs. Offshore wind farms already generate 11 GW per year and a further 12 GW are in the pipeline. Up to £320 million in government support is dedicated for floating wind ports and infrastructure.

Both France and the UK face local opposition to the installation of wind and solar farms which has slowed down their deployment. The development of floating offshore wind solutions, which enable wind farms to be installed further from the coast with less visibility from land, will benefit from stronger and more persistent wind power, as well as less local resistance.

Batteries Energy Storage Systems (BESS) for cleaner, smarter cities

Battery energy storage systems (BESS) are essential to support the integration of renewables in electric power systems. By storing energy from renewable sources, which can then be used when it's most needed, the electricity system operates more efficiently, reducing the risk of blackouts. While BESS is not yet at the scale required to support large-scale grid requirements, it can be used at a small-scale micro-grid or mini-grid level.

UK example

Battery storage systems can play an integral role in "Smart Cities". The Energy Superhub in Oxford is pioneering an integrated approach to decarbonizing power, transport and heat. It aims to reduce CO_2 emissions by 10,000 tonnes per year, equivalent to taking 2,000 cars off the road, to help Oxford achieve net zero by 2040. The project combines rapid EV charging, hybrid battery storage, low carbon heating and smart energy management. The project provides a blueprint for towns and cities to cut carbon emissions and improve air quality.

EDF Renewables has installed the UK's first transmission-connected battery, sited at the national grid substation in Cowley. The 50MW 'hybrid' lithium-ion/vanadium flow battery will support more renewables, increase grid resiliency and create a smarter, more flexible system.

Hydrogen – clean energy of the future is a strategic priority for France and the UK

Hydrogen (H_2) is the simplest chemical element and the most abundant element in the universe. It is a colorless, non-toxic, and highly combustible gas, with high energy density – more than 2.5 times that of petrol or diesel.

We differentiate three main types of hydrogen:

- Grey hydrogen produced via methane reforming which represents around **95% of production today**
- Blue hydrogen (or low carbon) produced with **Carbon Capture & Storage (CCS)**
- Green hydrogen produced via the electrolysis of water powered by **renewables**

Hydrogen is the most widely used industrial gas in the refining, chemical, and petrochemical industries today and is expected to become widely used as a clean energy carrier. Complementing other decarbonization technologies like renewable power, biofuels, or energy efficiency improvements, clean hydrogen (both blue and green) offers a long-term, scalable, and cost-effective option for deep decarbonization in sectors such as steel, cement, maritime transport, and aviation.

France

The development of clean hydrogen is a strategic investment priority for France. Since 2018, France was among the first countries to set up a dedicated industrial cluster to create an ecological, technological, and economic ecosystem to be internationally competitive. The strategy has three objectives:

1. To install sufficient electrolysers to make a significant contribution to decarbonization of the economy
2. To develop clean mobility solutions, in particular for heavy vehicles
3. To build an industrial hub to generate employment and safeguard technological expertise

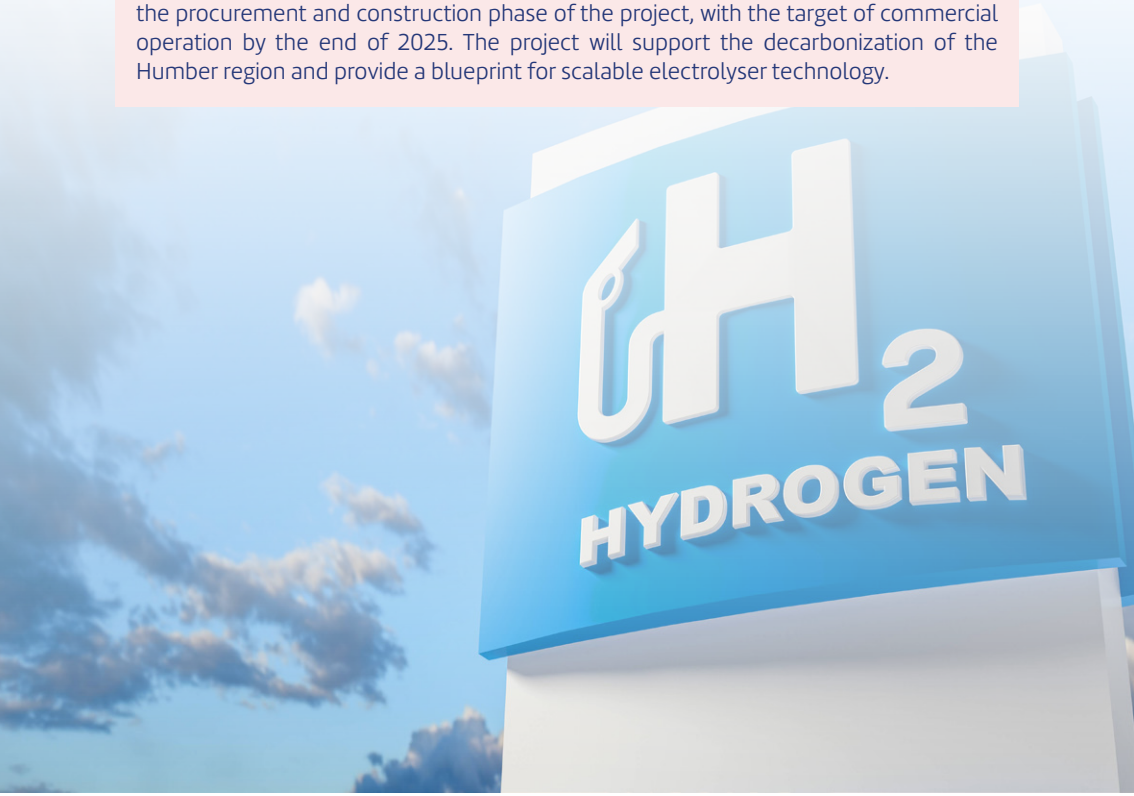
The latest report published in December by **France Hydrogène** identifies over 250 projects throughout France, for a total of 1 million tonnes of clean hydrogen (blue and green) per year by 2030.

UK

Driving the growth of low carbon hydrogen is one of the UK government's top ten priorities for a green industrial revolution. The Gigastack Project is the UK's flagship renewable hydrogen project, to prove the economic viability of renewable hydrogen at scale and demonstrate the full decarbonisation potential of offshore wind.

- The Orsted Hornsea 2, the world's largest offshore windfarm will generate 1.4GW of renewable electricity.
- ITM Power will generate 100MW of renewable hydrogen using its next generation of electrolyser technology. Its new Gigafactory in Sheffield is now the world's largest electrolyser production facility.
- The Phillips 66 Humber refinery will use renewable hydrogen for up to 30% of its existing refinery demand, reducing CO_2 emissions.

The feasibility study and FEED study have been completed, the Gigastack Consortium is now focused on reaching Final Investment Decision (FID) by Q2 2023 to progress with the procurement and construction phase of the project, with the target of commercial operation by the end of 2025. The project will support the decarbonization of the Humber region and provide a blueprint for scalable electrolyser technology.



IV. The Energy Transition for different business sectors

The Energy Transition will have a profound effect on all business sectors in many different ways. From energy intensive sectors through to financial services, from manufacturing to transport, from construction to property management, economic interdependence means no business can afford to ignore the transformation taking place. One thing is clear, it requires long term planning and investments.

The France Relance 2030 recovery plan is a massive €100 billion investment plan to transform infrastructure and invest in training. The government will support the thermal renovation of buildings, the decarbonization of industry, green hydrogen, cleaner transport and the transformation of the agricultural sector. Five strategic sectors have been targeted for investments, these include health, essential industry inputs, electronics, the agrifood industry and industrial 5G applications. The plan will increase workforce training availability to around 400,000 people.

The UK Ten Point Plan for a Green Industrial Revolution will mobilize £12 billion of government investment and up to £36 billion of private investment across energy, buildings, transport, innovation, and the environment. The ambition is to create and support up to 250,000 green jobs and reinvigorate industry by 2030.

If the scale of investments of the two plans is striking, they are not directly comparable. The France Relance plan goes beyond the Energy sector, while the UK investment plan is focused on technologies.

So, whilst the energy transition presents many challenges, it also offers new opportunities. Businesses need to seize the support available to help them make the necessary changes. 2030, which is just seven years away, marks the point at which these transformations must be implemented and delivering results.

In this section we consider the impact of the energy transition on three business sectors: aviation, transportation, and industrial machines.

The Fight for a Net-Zero Aviation, Ardian Infrastructure

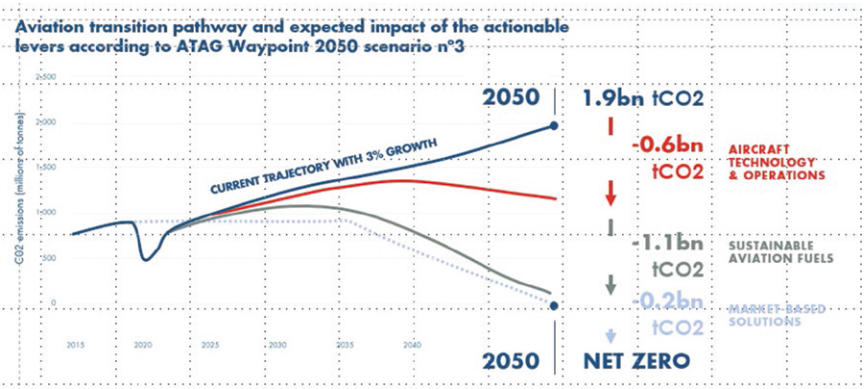
Ardian** is a world-leading private investment house majority owned by its employees and managing or advising $140bn across Europe, the Americas, Asia and the Middle East. Its Infrastructure team comprises more than 60 investment professionals who manage $21 billion of essential assets. In 2021, Ardian, in partnership with FiveT Hydrogen, launched Hy24, the world's first investment platform focused on clean hydrogen.* **www.ardian.com

In November 2022, Ardian published a study entitled **The Fight for a Net Zero Aviation**[1] as part of its global reflection on how infrastructures can improve their impact on their surrounding environment and community. This follows publication of two previous studies in 2018 and 2019 on the concept of "Augmented Infrastructure". The infrastructure of tomorrow is defined around five key pillars: intelligent, open, prolific, resilient, and impactful.

The 2022 study explores the specific decarbonization levers for the air transport industry taking an airport-centric approach. While airports represent less than 10% of the aviation industry's emissions, they play a crucial role for the decarbonization of the whole sector.

The aviation industry is currently responsible for around **2–3% of the global emissions.** Despite the slow-down in air travel due to Covid-19, global air traffic is forecast to reach up to 10 billion passengers by 2050. **Without efforts to decarbonize the industry, aviation could be responsible for 22% of global emissions in 2050** according to the European Commission. Still, the aviation sector is an important contributor to economic growth, connecting people and businesses. In France, it represents more than 1 million direct and indirect jobs.

Between advocates for drastic reduction in air transport and blind faith in technology, a third approach is possible: combining sobriety in usage incentivized by new regulations and massive investments in innovative projects to accelerate the transition of the sector. The report identifies three main decarbonization levers.



[1] The following companies were interviewed for this study: airports (ADP Group Turin, Naples, Milan, Bangalore), airlines (Air France), industrials (Airbus, Air Liquide, Total Energies, Safran), start-ups (Skyports, Wintics, Safety Lines) leaders as well non-profit organization (Aéro-Decarbo) to gather their visions and innovation plans for the decarbonization of aviation.

1. Large scale deployment of Sustainable Aviation Fuels (SAF)

The whole process of jet-fuel burning, from extraction to combustion, is a major source of aviation carbon emissions, accounting for more than 90% of an aircraft lifetime's CO_2 emissions.

To boost production and supply of SAF, the ReFuelEU Initiative has set the objective to increase the share of SAF in the aviation fuel used in the EU – from 2% in 2025 to 85% by 2050. This could be a decisive catalyst for investments.

According to ATAG (Air Transport Action Group) scenario 3, deploying SAF on a large scale could help save 1.1bn tons of CO_2 emissions by 2050, representing 53% of the air transport's decarbonization goals. This scenario (aspirational and aggressive technology perspective) is generally considered as the reference scenario by the industry actors interviewed in our study.

Industrials are committed to make SAF a reality. Milan Airports (SEA) is collaborating with ENI to improve the availability of SAF for aircrafts in Milan airports. ENI is expected to provide SEA with ENI "Biojet" soon, a biofuel made exclusively from waste materials such as Used Cooking Oil (UCO) or animal fats, to be blended with conventional jet fuel up to 50%.

By 2030 aircraft manufacturers target 100% SAF compatibility for any new aircrafts produced (vs 50% today). **Safran** is already working on the next generation of engines with a fuel consumption reduced by 30% (vs today's latest planes) by 2035.

2. Aircraft technology improvements
(related to engine, aerodynamics, hydrogen or elec-supported propulsion systems)

Operational efficiency

Although aircraft efficiency is known to have improved by 85% over the last 70 years, there is still room to improve engine and airframe performance. As of today, only 20% of the fleet in service is made of latest generation aircrafts, like Airbus' NEO series. With new aircrafts emitting about 20 to 25% less CO_2 than their predecessors, fleet renewal is a very significant lever to reduce carbon emissions.

Hydrogen

While SAF emit as much CO_2 as kerosene during the combustion phase, clean hydrogen, produced from renewable energy, is the only next generation of aircraft fuels whose combustion is carbon neutral. **Airbus ZEROe** is committed to commercialize the world's first hydrogen-powered aircraft by 2035. The Group is exploring aircraft platforms powered with H2 combustion thrust or H2 fuel cells.

Preparing a **dedicated hydrogen supply chain** for airports is another key milestone to overcome. **Air Liquide and Groupe ADP** launched in 2021, in collaboration with Airbus, a study to assess potential configurations for liquid hydrogen production, supply and distribution in airports for airlines.
Likewise, **Torino Airport** is transforming its facilities into a smart energy hub to produce green hydrogen. It has partnered with Snam to develop the first hydrogen-ready fuel cell in Italy, in cogeneration mode with a capacity of 1.2 MW. While the energy produced on site is expected to be consumed directly by the airport initially, Torino Airport is actively working with EU and Italian regulators to enable the sale of electricity and heat produced to external partners.

Electrification

Electric aircraft which do not emit CO2 during operations (use of renewable energies), are also being considered – mainly for short-haul flights. **Skyports** is a UK-based infrastructure developer for Advanced Air Mobility. It is working with airports to build and operate vertiports infrastructure welcoming all types of electric vertical takeoff and landing aircraft (eVTOL). For instance, it works cojointly with **Groupe ADP** to enable first demonstration flights in the Paris Metropolitan Region for the 2024 Olympics, and commercial services in collaboration with Milan Airports for the 2026 Winter Olympics.

For airports, it means becoming technology-agnostic to supply all aircrafts with these new fuel propulsion technologies.

3. Improvements in the efficiency of airports operations and infrastructure

Airports are at the center of the aviation ecosystem and in a position to enhance collaboration between stakeholders. With this objective in mind, Ardian Infrastructure's digital team developed in 2019 an in-house digital tool, Air Carbon.
Air Carbon provides real-time estimates of airports' carbon emissions based on airports' operational data, ranging from aircraft landings and takeoffs to ground operations. It can also simulate coherent carbon reduction trajectories based upon airports' current carbon footprint estimates and future initiatives expected to be put in place. Air Carbon is already deployed in Milan Malpensa, Milan Linate, Naples and Torino airports.

Finally, to achieve net-zero objectives, airports and other air transport stakeholders will have to **offset their residual carbon emissions**. In that sense, a global offsetting scheme specific to the aviation industry was implemented (CORSIA1). Airlines and other aircraft operators will have to offset any growth in CO_2 emissions above 2020 levels that cannot be reduced by operational improvements or SAFs with carbon credits. As of 1 January 2022, 107 States had announced their intention to participate in CORSIA.

Decarbonizing the Transport and Buildings Sector, Loic Chavaroche, Sterne Premium Logistics Services

Loic Chavroche is Chief ESG & CSR Officer of Sterne Logistics Services. The Sterne Group is an international logistics service provider operating all types of premium transport, planned or on-demand: urban, urgent, express, regular, and tailor-made.
www.groupe-sterne.com

The transport sector is one of the most CO_2-emitting sectors in France, with 2/3rds of these emissions generated by passenger transport activity and 1/3rd for the transport of goods. Freight-related emissions represent 9% of French GHG emissions.

The key decarbonization levers have been set out in the report presented by the "Shift Project", but so far, our sector, which involves long-distance road transport of goods, including the Channel Crossing by tunnel or ferry, has made little progress.

Reducing carbon emissions and more widely GHG emissions can only happen with an overhaul of transport flows and energy mix to establish a multimodal and multi-energy network which integrates sea, rail, river, road (both fossil fuel and electric vehicles), and cycle logistics.

Implementing this revolution requires a profound modification of supply chain flows and the creation of multimodal platforms or hubs and micro-hubs to facilitate the transition from one mode of transport to another, as well as a change in the economic model, to adapt to an increase in costs linked to the multiplication of handling operations.

The creation and multiplication of micro hubs in the immediate vicinity of city centers and low emission zones (LEZ), such as London and Paris, will also require investment in urban infrastructure to allow the completion of city routes, or the last kilometers, either by electric vehicle or cycle logistics.

Regarding the energy mix, we see several solutions emerge over time as technologies evolve, which allow us to continue using high-carbon vehicles, including biofuels with bio diesel (ester) and synthetic diesels such as HVO, XTL, and Oléo 100, although this can create a strain on agricultural land use.

Today, using a mix including natural gas vehicles (NGV) and bio-gas vehicles, will allow us to significantly reduce CO_2 emissions for medium and long-distance deliveries. A rapid increase in the production capacities of XTL and HVO is an attractive short-term solution, making it possible to reduce CO_2 emissions by up to 90% per kilometer in recent diesel engines, without modifying the engine and with full reversibility.

More distant solutions include the installation of catenaries and adapted vehicles on mainline routes across France and Europe to allow a greater reduction in GHG emissions, subject to an adaptation

of electricity production in France and Germany to ensure a permanent energy supply for these lines to maintain supply chain flows.

Whatever the solutions to be deployed, transport companies must analyze their flows and develop strategies in line with recognized reporting frameworks such as SBTi (Science Based Targets initiative). They must then establish short, medium, and long-term policies which integrate required investments, the changes in costs, and the willingness of the market to pay for these changes.

It is more vital than ever to reduce GHG emissions and align with the Paris agreements to limit global warning below 1.5 degrees and achieve carbon neutrality by 2050.

As part of our integrated CSR and ESG commitments, in 2022 the Sterne Group is aligned with the SBTi reporting initiative to transition towards a net zero economy.

Reducing Energy Use in Buildings

Energy use in commercial buildings is another key area for reducing emissions. We are committed to making major energy savings in our buildings, in line with regulatory standards. We are certifying our construction sites in accordance with BREEAM standards "Very Good". For our operating sites, we optimize the use of natural light and reduce the lighting charge with 100% LEDs which detect movement. In response to the new Renewable Energy regulations (ENR), we are investing massively in the installation of solar panels for our own consumption as well as reinjection to the grid.

All these projects are aligned with the government policy of drastic energy sobriety. Reducing the heating temperatures in offices and the widespread use of low-consumption lighting, including the installation of solar lampposts, allows us to target a reduction in line with national commitments, and those of the services sector of -40% by 2040.

One thing is for certain, reducing energy consumption requires a profound change in the way we live and travel. We will always need transport companies; they must prepare their transformation today to adapt to the challenges of tomorrow.

[2] *BREEAM the world's leading science-based suite of validation and certification systems for a sustainable built environment.*

Making low carbon machines – the future for industry, Philippe Girard, JCB France

***Philippe Girard** is head of JCB France as well as head of JCB Sales in West & North Africa, having spent 28 years with JCB in France & UK in different roles.*

JCB is a 77-year-old family business led by Lord Bamford. With annual turnover around €6 billion, JCB has over 17,000 employees around the globe, 23 plants producing over 100,000 machines and 350 models, to serve construction, building and agriculture as well as industry, power and military. ***www.jcb.com***

The energy crisis is having a direct impact on the industrial machinery sector, firstly due to the increased cost of building machines and secondly, due to the higher cost of fuel used to power machines – in Agriculture as well as Construction. This is feeding through to slower market demand as customers are questioning the massive increase in costs to produce or build. These cost increases are coming in addition to rising labour costs and inflation and are difficult to pass on to the market through price increases.

Which energy ... for which usage?

The Energy Transition creates several challenges for the industry, but careful segmentation can offer different opportunities. There is no "one-size-fits-all" solution. Depending on energy requirements and usage, different solutions and different fuel technologies can be developed.

One thing is for sure, there is no single alternative to carbonized fuel, but several options to be considered according to usage:

Firstly, JCB is already engaged in energy transition by offering a full range of electric battery machines. But batteries have certain limitations – namely **extra cost** and **recharging time**. These machines are only appropriate for low power units (< 55 KW) with few hours of usage per day. They do not yet offer enough autonomy to our customers who are working long hours. The challenge is to increase autonomy and bring down costs by scaling up production. However, the current cost of batteries, is affected by supply chain challenges, inflation as well as huge demand from the automotive industry.

Secondly, at JCB we will continue to work on combustion engines to operate with cleaner **biofuels** such as HVO (Hydrotreated Vegetable Oil) or B100 (100 % rape oil). But the volume of these clean fuels is limited. Europe has fixed a maximum of 15% of Energy production vs Food production to continue to feed the planet. This solution is suitable for specific high-power, limited series of machines

The future is for JCB is the **hydrogen combustion engine** developed inhouse. This is basically a combustion engine with substantial modifications to be powered with 100% H2. Using familiar technology that is easy to make and cost competitive, the solution is very promising. The H2 engine is quick to deploy and easy to operate and maintain by dealers and customers. The key is hydrogen availability, but Europe is working hard increase supply and produce green hydrogen. To facilitate customer usage of our hydrogen fuelled machines, we are also providing a refuelling mobile unit to store and distribute hydrogen on customer work sites.

V. Views from our members: Energy Transition challenges & opportunities

BP – by Fabio Montemurro, Head of Power Systems and Renewables

BP is an integrated energy business with operations around the world, employing 65,900 people. In 2021 it generated net profits of $7.57 billion. It has set out an ambition to be a net zero company by 2050, or sooner. ***www.bp.com***

In the short term, how is the energy crisis impacting your company and sector of activity?

The current energy crisis has exposed the multi-dimensional issues around the energy transition. First, reducing global greenhouse gas emissions remains a necessity – yet, except for 2020, total global emissions have gone up every year since the Paris agreement. Second, energy systems are complex and need to be resilient and robust to a range of shocks and disturbances – from geopolitics to the variability of weather. And third, energy systems that work must provide energy that is more accessible – at a more affordable price.

This is exactly what we are working hard towards in bp – providing energy which is more affordable, secure and – increasingly – lower carbon. So, while the energy crisis remains a dramatic event which is having a significant effect on people's lives and economies worldwide, as a company it reinforces the opportunity to accelerate the progress towards a better energy system.

Energy Transition: what are the challenges for your company/ sector of activity and what opportunities does it create?

We in bp remain focused on delivering our strategy to transform to an Integrated Energy Company – a company which can help solve that energy trilemma of lower carbon, secure, affordable energy. And we do that in two ways: through our resilient hydrocarbons business, keeping the energy flowing and providing energy security today; and, at the same time, investing to accelerate the energy transition.

On the hydrocarbons front, the opportunity is to run a business with lower costs, higher margin, and – importantly – lower emissions: we call them the "best barrels".

As regards accelerating the energy transition, there are two areas where bp is well positioned for growth and success. First, electrification of transport. We have a clear source of competitive advantage through our 20,000+ retail site network, more than 16,000 (and growing) EV charging points, a customer base of more than 16 million loyalty customers, our trading and shipping organization optimally sourcing our electrons, and strategic relationships with world leading auto manufacturers and mobility providers.

Second, we see great opportunity in low carbon hydrogen, and our ambition is to build a global leadership position, creating cost-advantaged production hubs. In the UK we are planning a cluster of hydrogen and carbon capture and storage (CCS) projects, including "green" (with electrolysers powered by renewables) and "blue" (with natural gas and CCS) hydrogen production facilities, the world's first commercial scale gas-fired power station with carbon capture, as well as the operation of the associated CO_2 transport and storage facility.

In your view, what energy solutions will emerge in the next 5 to 10 years' time?

First, we expect a further ramp up of renewable power, namely solar PV and wind (both onshore and offshore). As example, our solar joint venture Lightsource bp is aiming to develop 1GW of projects by 2026 in France. However, this will require a step change in the speed and complexity of planning and permitting.

Second, more and more projects for low carbon hydrogen – both green and blue – will emerge, as countries try to decarbonize hard-to-abate sectors and reduce reliance on gas.

And third, bioenergy – we believe there is a significant potential for biomass which is sustainable (for example from waste and agricultural residues) and which can be used across sectors – from biomethane for power generation and industry to bio-based sustainable aviation fuels.

Schneider Electric *– by Andrew McKenzie, Director of Strategic Business and Partnerships*

Schneider Electric specializes in digital automation and energy management services. With 128,000 employees, the company generated revenues of €28.9 billion in 2021. Schneider Electric drives digital transformation by integrating world-leading process and energy technologies, end-point to cloud connecting products, controls, software and services, across the entire lifecycle, enabling integrated company management, for homes, buildings, data centres, infrastructure and industries. ***www.se.com***

In the short term, how is the energy crisis impacting your company and sector of activity?

At Schneider Electric, meeting our customers' expectations is our key priority. We have been closely monitoring the European energy situation and we are continuously assessing and responding to changes. Schneider Electric has a robust business continuity plan which includes various scenarios to ensure we continue to support our customers. We leverage our supplier network across Europe and the world and at this stage we assess no critical or short-term risk for supply, in this context.

Energy Transition: what are the challenges for your company/ sector of activity and what opportunities does it create?

The challenges we face include skills shortages; we need more people in the industry to meet the various environmental targets set by government as well as customer demand (e.g. heat pump specialists). There are also challenges around supply chain shortages impacting materials and parts for certain key electrical infrastructure technologies.

In terms of opportunities, we are finding people are increasingly looking at how to be more energy efficient, resilient, and self-sufficient. They are embracing the 'no regrets' decisions such as deploying digital platforms to visualise their energy performance, our software and services are helping organisations (including our own) accelerate on a digitisation and sustainability pathway.

In your view, what energy solutions will emerge in the next 5 to 10 years' time?

I think the following will be key parts of energy solutions and net zero strategies.

Microgrids
A microgrid is a self-contained electrical network that allows you to generate your own electricity on-site and use it when you need it most. For this purpose, your microgrid will connect, monitor, and control your facility's distributed energy resources (DER) while enhancing performance, a stainable footprint and resilience. Microgrids can be connected to the utility grid or disconnected in "island" mode. When the grid goes down or electricity prices peak, microgrids respond automatically.

Vehicle to Grid
As we see a rapid uptake of Electric Vehicles (EV) we will also see 'Vehicle to Grid technology' (V2G) emerge (although it may also be called Vehicle to Building or Vehicle to Home). This enables energy stored in EV to be fed back into the grid at either a local level or to the national grid to help supply energy at times of peak demand. The technology needs to be deployed on a suitable electrical network, some assessments and upgrades may be required to enable the technology. V2G can work for domestic, fleet, and commercial operators.

Aggregation Services and Demand Response
As more Distributed Energy Resources (DERS) – including renewable energy – are added to the grid, services to dynamically match available generation with demand and balance the grid are required. This can include options such as Demand Response (DR), where consumers are incentivised financially to reduce or increase their demand at peak demand periods, which in turn can influence the pricing of electricity.

Some sites that have battery storage can participate in DR by drawing electricity from the grid at certain times and then consuming the electricity later or selling it back to the grid. As batteries get bigger in size it can be challenging to coordinate the charging and discharging of these assets, this is where Aggregators come in. They coordinate and enable different battery storage technology using centralised control software to provide Demand Response programmes, almost like virtual power plants.

Lhyfe – by Thomas Créach, Technical Director

Launched in Nantes (France) in 2017, Lhyfe produces and supplies green and renewable hydrogen for mobility and industry. Its production plants and upcoming projects are designed to produce renewable hydrogen in industrial quantities. The company has a commercial pipeline representing a total production capacity of 9.8 GW by 2030 (figure as of September 2022).

Lhyfe inaugurated its first renewable green hydrogen industrial production site in the second half of 2021. In June 2022 Lhyfe launched in the UK, and in September 2022, it inaugurated the world's first offshore renewable green hydrogen production pilot site linked to a floating wind farm, in the port of Saint Nazaire, France. ***www.lhyfe.com***

In the short term, how is the energy crisis impacting your company and sector of activity?

First of all, the need to gain energy sovereignty has encouraged the government and big players (industries, local authorities, companies, etc.) to consider local energy sources. Green renewable hydrogen is one of these solutions as it is produced from water and local renewable energy. REPowerEU, the European Commission's plan to reduce European reliance on Russian fossil fuels well before 2030, advocates accelerating the deployment of renewable energy and hydrogen.

Secondly, this energy crisis, combined with the ecological crisis, has increased interest in renewable energy solutions, which are now increasingly favoured by the population concerned about the future of our children.

Finally, the increase in the price of gas has made renewable green hydrogen attractive and competitive with other energy sources and carriers, including other less green ways of producing hydrogen.

Energy Transition: what are the challenges for your company/ sector of activity and what opportunities does it create?

Our challenges are multiple:

- Technology: this year we have achieved two World Firsts! In September 2021, we produced renewable green hydrogen on land, via a site powered by wind turbines, and in September 2022, we produced renewable green hydrogen offshore (this one is a pilot). No one has ever done this before, so we wanted to prove that it was possible today. We have been convinced since the creation of Lhyfe that if we want to massively decarbonize industry and mobility, we need large quantities of renewable green hydrogen, and that to do this, we need to produce it directly at sea, thanks to the power of offshore wind farms. The first challenge is therefore technical.
- Permitting: it took 10 years for the first French wind farm to be built. It is essential to reduce these delays to enable the sector to be deployed rapidly.
- The last challenge is the democratization of green and renewable hydrogen. This begins with a good understanding of the relevance and overall efficiency of hydrogen throughout the value chain (production/ use). And then, its deployment across territories, through ecosystems that avoid the ecological divide, subsidies to end users to allow them to start equipping themselves, which will have the effect of lowering the costs of hydrogen.

Regarding the opportunities:

- Green and renewable hydrogen contributes to the decarbonization and energy independence of the country. It proposes a new energy paradigm where the human is no longer a “predator” but a “contributor” to his environment.
- It generates value in the regions through the construction of a new industrial sector and generates activity and employment.

VI. Conclusion

The energy transition is fundamental to limit global warming well below 2°C compared to pre-industrial levels. In many parts of the world, including in France and the UK, 2022 has been the warmest year on record, with the highest number of climate related natural disasters. We cannot pursue the same energy demands trajectory. Global energy consumption rose by almost 6% in 2021, more than reversing the sharp fall in energy seen in 2020 due to the Covid-19 pandemic. It continued to grow in 2022.

The energy crisis, caused by Russia's invasion of Ukraine, highlights the fragile and interdependent nature of our energy systems. High energy costs feed through to every aspect of society, affecting households, businesses, and governments. Will this crisis be the trigger that drives a structural energy transformation?

Several challenges have been raised by the companies that have contributed to this report. The key challenge identified is the cost. As Ardian point out in their study, the way forward will combine "sobriety in usage incentivized by new regulations and massive investments in innovative projects." Sterne Logistics explain that decarbonization of the transport sector will require "a profound modification of supply chain and transport flows, which necessitate short, medium, and long-term policies that integrate required investments, costs, and the market willingness to pay." BP and Lhyfe illustrate the complexity of planning and permitting. It took 10 years for the first French wind farm to be built. It is essential to reduce the time to market to be able to scale up technologies and lower costs. Schneider Electric identifies skills shortages as an important challenge.

Faced with these challenges, there are nevertheless many opportunities that have been identified. The energy transition creates a new energy paradigm, designed around energy efficiency, better use of resources and a circular economy model. Technologies already exist to decarbonize the energy sector and support greater electrification. All the energies presented in the report will contribute to the energy transition.

There is no single solution, which means that there will be huge opportunities for businesses on both sides of the Channel to make a difference, most notably in the field of nuclear energy, renewables and in the development of a green hydrogen economy. Business models will inevitably change to be more energy efficient, resilient, and self-sufficient. Digital solutions, using smart technology to visualize energy performance, adapting

supply chains to source more locally, new services and solutions around a more circular economy, will all form part of the new energy ecosystem. And consumer habits will inevitably change in response to higher energy costs.

We are already seeing a shift. In 2022, renewables generated a record amount of electricity in the UK, making up 40% of supply and enabling the UK to be a net exporter of electricity for the first time in a decade. In France, the energy saving program launched by RTE, the French electricity network, to reduce energy consumption for households, businesses, and local authorities by 10% has avoided power cuts, helped by a mild winter.

The lesson from 2022 is that we need to break our addiction to fossil fuels. By accelerating investment in local, low carbon energies and renewables, France and the UK can end their reliance on expensive, imported fossil fuels and stay on track to reach their targets of the Paris climate agreement.

References

- Research from Imperial College London
- BP Statistical Review of World Energy 2022
- World Economic Forum – Energy Transition 101: Briefing Paper July 2020
- Energy Super Hub Oxford
- Gigastack UK
- Ardian: The Fight for a Net Zero Aviation

French Government publications

- https://www.gouvernement.fr/communique/12687-le-gouvernement-etend-le-bouclier-tarifaire-sur-le-gaz
- https://www.ecologie.gouv.fr/tarifs-gaz
- https://www.ecologie.gouv.fr/ecowatt-meteo-lelectricite
- https://www.ecologie.gouv.fr/strategie-nationale-bas-carbone-snbc#scroll-nav__4
- https://www.diplomatie.gouv.fr/en/french-foreign-policy/economic-diplomacy-foreign-trade/promoting-france-s-attractiveness/france-relance-recovery-plan-building-the-france-of-2030/
- https://www.gouvernement.fr/actualite/la-nouvelle-strategie-energetique-de-la-france
- https://www.ecologie.gouv.fr/biocarburants#scroll-nav__6
- https://s3.production.france-hydrogene.org/uploads/sites/4/2022/12/Re%CC%81sume%CC%81-executif-Etude-trajectoire-FH-2022.pdf

UK Government publications

- https://www.gov.uk/government/publications/energy-bills-support/energy-bills-support-factsheet-8-september-2022
- https://www.gov.uk/guidance/getting-the-energy-bills-support-scheme-discount
- https://www.gov.uk/guidance/energy-bill-relief-scheme-help-for-businesses-and-other-non-domestic-customers
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf

EU Government publications

- Fit for 55 – Green Deal
- REPowerEU
- EU Emissions Trading Scheme

Thanks for their contribution to

***Françoise Rausch**, Chairwoman of the Cross-Channel Institute*

***Rebecca Le Rouzic**, Communications Consultant & Energy Market Specialist*

ARDIAN

JCB

bp

STERNE

Schneider Electric

Lhyfe

and our partner the

British Embassy Paris

The Sectoral Analysis on the Energy Transport
is a publication of the Cross-Channel Institute,
Think Tank of the Franco-British Chamber

Cross-Channel Institute
c/o Franco-British Chamber
22 rue de Londres - 75009 Paris
+33 (0) 1 53 30 81 32
contact@crosschannelinstitute.com
www.crosschannelinstitute.com

Linkedin: Cross-Channel Institute
Twitter: @CrossCInstitute
Instagram: crosschannelinstitute
Facebook: Cross-Channel Institute