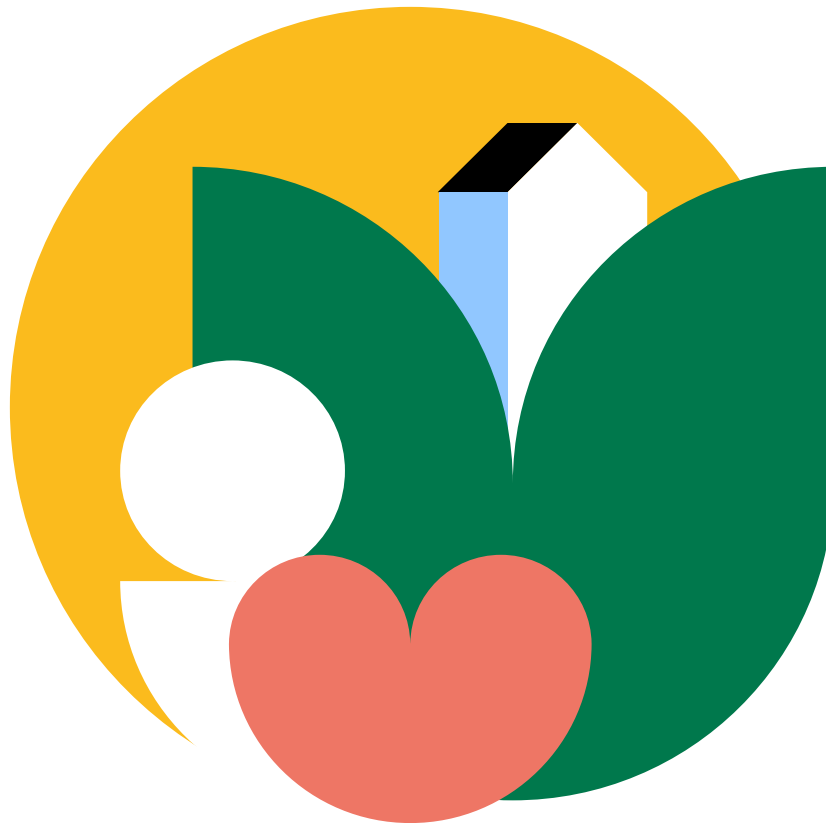




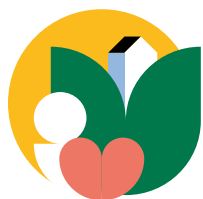
**MINISTRY  
OF THE ECOLOGICAL  
TRANSITION,  
BIODIVERSITY,  
FORESTRY, SEA  
AND FISHERIES**

*Liberté  
Égalité  
Fraternité*



# **STATE OF THE ENVIRONMENT IN FRANCE**

**Synthesis of the 2024 Report**



# Reliable, shared information,

## a lever for ecological transition

Thirty years ago, France's first State of the Environment Report was published. Thirty years that have been marked by a growing awareness on the environment and its protection, at a time when the impacts of climate change were becoming more tangible and intense in every corner of the globe.

Successive issues of this report since 1994 had **the same objective: to share knowledge in order to take greater account of environmental issues in collective and individual decision-making, and to contribute to making the ecological transition a reality.** The 2024 edition is published in the same spirit: to provide keys to reading and understanding the ecological transition, to facilitate a good grasp of subjects that are complex by nature.

This summary highlights the report's key findings. It focuses on four intrinsically linked issues: the depletion of natural resources, the pollution of natural environment, the climate change and the decline in biodiversity.

For each of these themes, progress has been made in certain areas, encouraged by numerous public policies and individual or collective actions. Nevertheless, the situation remains worrying.

Building a world fit for future generations remains the great challenge that humanity is facing.

# FACING ENVIRONMENTAL CHALLENGES: A STORY OF AWARENESS

## KEY MILESTONES

**1972**

### **First United Nations Conference on the Human Environment in Stockholm**

As a result, the Stockholm Declaration lays down the main principles of international environmental policy, and the United Nations Environment Programme (UNEP) is created.

**1988**

### **Creation of the Intergovernmental Panel on Climate Change (IPCC)**

**1992**

### **Earth Summit in Rio de Janeiro**

This event reaffirmed the global nature of environmental issues and anchored the concept of sustainable development, which emerged in 1987.

**1997**

### **COP3 Climate in Kyoto**

Adoption of the Kyoto Protocol, the first treaty to reduce greenhouse gas emissions.

**2007**

### **Creation of the International Resources Panel (IRP)**

**2012**

### **Creation of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)**

**2015**

### **Adoption of the 2030 Sustainable Development Goals (SDGs)**

**2015**

### **COP21 Paris Climate**

Adoption of the Paris Agreement, which sets the goal of global warming below 2°C, or even 1.5°C, above pre-industrial levels by 2100.

**2022**

### **COP15 Biodiversity in Montreal**

Adoption of the Kunming-Montreal Biodiversity Agreement, with objectives to protect 30% of land areas, restore 30% of degraded ecosystems, reduce subsidies that damage biodiversity, etc.

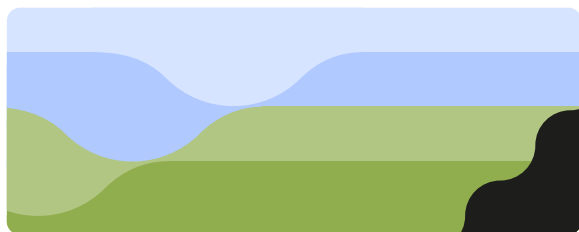
**2023**

### **COP28 Climate in Dubai**

Among its decisions: to triple the production of renewable energies by 2030 and phase out fossil fuels by 2050.

# 4 CHALLENGES

TO RESPOND TO THE  
ENVIRONMENTAL CRISIS



## Natural Resources

P. 6

**Between import dependence and scarcity**

- **Fossil fuels** still dominate French energy consumption
- 99.7% of **metal mineral resources** imported
- **Non-metallic minerals** mainly from local sources
- **Biomass**: renewable, but not without environmental impact



## Pollution of natural environments

P. 10

**A threat to the environment and health**

- **Pollutants monitored for a long time**, with reduction targets: metals, fine particles, radio frequencies, etc.
- **Contaminants that are still poorly monitored, yet very present**: plastics, drug residues, PFAS, etc.
- **French initiatives and funding** to reduce pollution



## Climate change

P. 14

**Increasingly perceptible effects**

- **What are the concrete impacts?**
- **Consequences and evolution** of French greenhouse gas emissions into the atmosphere
- **Levers for combating climate change**: mobilizing at every level



## Decline of biodiversity

P. 18

**Nature under pressure**

- **Worrying signals**
- **The impact of declining biodiversity on different ecosystems**: urban, forest, agricultural, marine and wetland environments, etc.
- **Public authorities' commitments** to respond to growing public concerns

## Environmental issues are inter-linked by nature

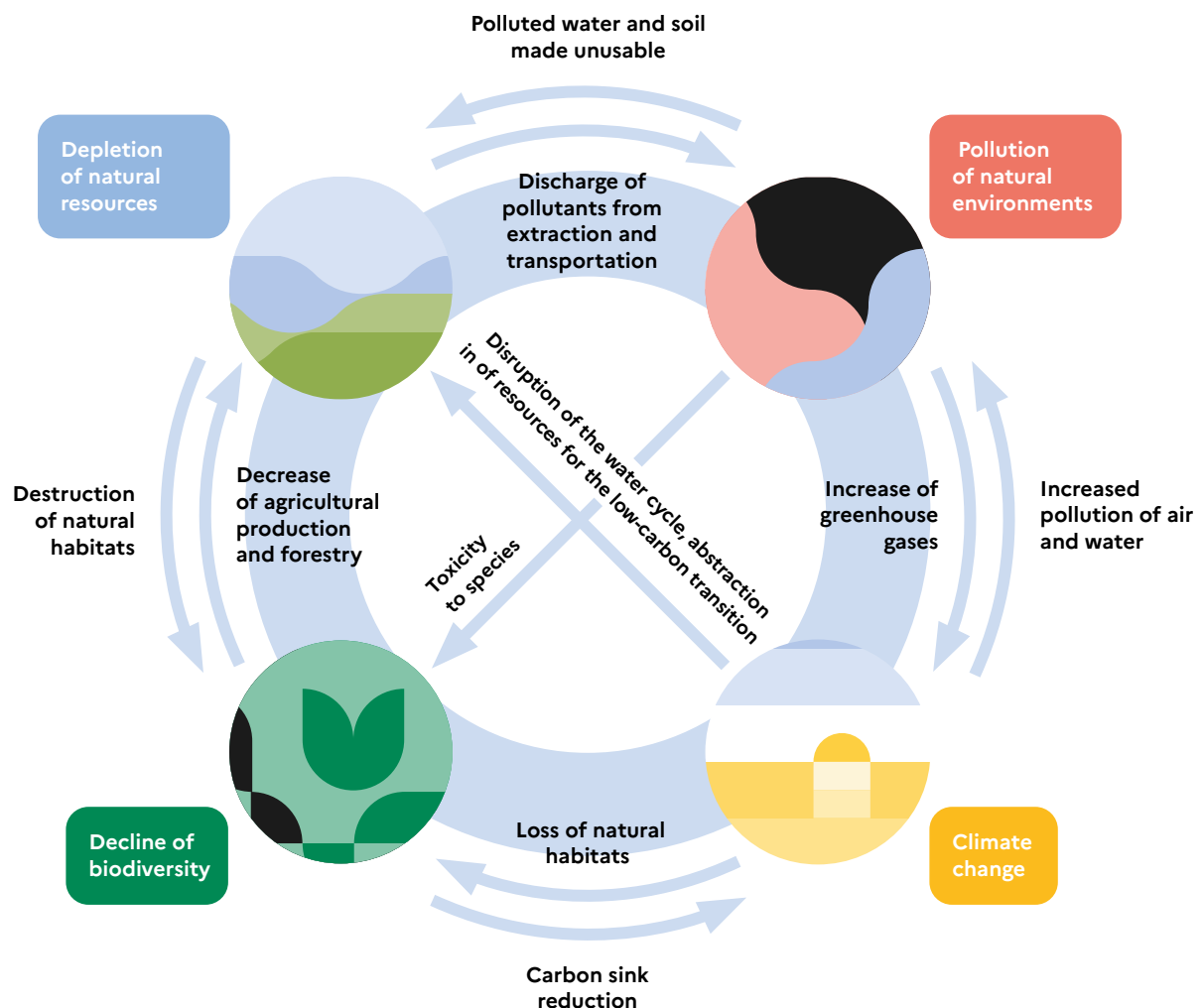
Natural resources, pollution, climate and biodiversity are four fundamentally interconnected aspects of today's ecological challenge.

Each has an influence, alone or in interaction with the others, on the planet's environmental balance.

The diagram below provides a simplified illustration of the relationships between these issues. Without being exhaustive, it highlights the need for a systemic approach to understand the state of the environment.

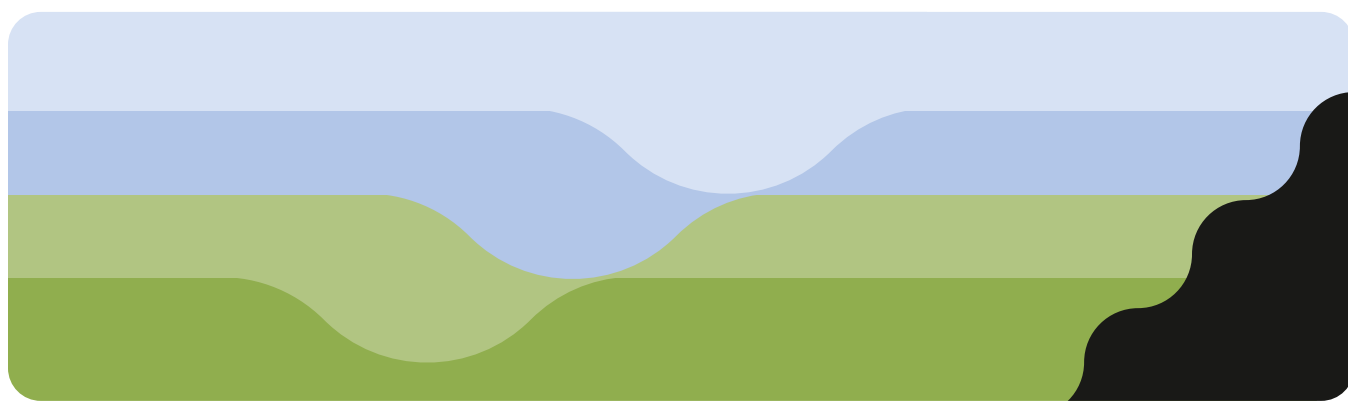
Through our production and consumption patterns, we extract resources and release pollutants into the natural environment, with direct or indirect consequences for biodiversity and climate. The resulting environmental changes directly affect our well-being and health.

### Four interacting environmental challenges



# Natural resources

Between dependence on imports and increasing scarcity



Energy production, construction, agriculture and more: natural resources are essential to the smooth running of society and economy.

that emit large quantities of greenhouse gases, dependence on imports, the possible scarcity of certain strategic resources, etc.

But while our need for natural resources is considerable, we face a number of challenges: the impact of their extraction on the environment, the still preponderant role of fossil fuels

This context reinforces a dual imperative: to reduce consumption and to encourage a more virtuous use of resources.

## TO REMEMBER

**A consumption of fossil fuels** (oil, gas and coal) **to reduce** primarily to limit greenhouse gas emissions.

**A strong dependence on imports for mineral metallical ressources,** in a context of strong demand worldwide.

**Large volumes of non-metallic minerals mined on the territory** for mainly local use, with growing public reluctance to extract aggregates.

**Sober water use to be strengthened** to ensure a balance between the resource and the use, and guarantee good conditions of water environments.

**Strong expectations on the production of biomass,** for carbon capture and various environmental use (food, biosourced materials, energy).

## ENERGY RESOURCES: FOSSIL FUELS STILL PREDOMINATE

In France, fossil fuels (notably gas and oil) account for the largest share of final consumption. The remainder of final consumption is based on renewable sources (wood, hydraulic, biofuel, wind, solar, etc.) or nuclear power.

Today, there are many issues linked to energy resources:

- **France's dependence** on imports for fossil fuels and uranium, and the resulting strategic risks (geopolitical instability) and economic risks (trade balance and inflation);
- **resource depletion**: energy resources are limited on the scale of human history;
- **climate change**, mainly caused by the use of fossil fuels.

**NOTA BENE** At the COP28 climate conference in 2023, participating countries agreed for the first time on the need of a transition away from fossil fuels.

**The climate issue is the most pressing today. Indeed, before fossil fuels run out we need to think about the post-fossil fuel era in a much shorter time frame.**

It is now scientifically established that it is necessary not to exploit all currently known fossil fuel reserves, we hope to achieve objective of limiting global warming to below +1.5°C, or even +2°C.

There are several ways to limit our consumption of fossil fuels:

- **Producing energy from low-carbon sources**  
> *via renewable energies*

Their development should play a decisive role in reducing the consumption of fossil fuels. Moreover, they can be deployed at a rapid pace. Objective: 33% of energy produced from renewable sources in gross final energy consumption by 2030, according to the multi-annual energy program (PPE), compared with 22.2% in 2023. This target will be revised upwards in the next PPE, in line with European objectives.

However, wind and photovoltaic power plants only produce electricity intermittently depending on sunshine and wind conditions, requiring the development of new flexibilities (e.g. consumption and storage). In addition, the development of these technologies requires the use of a number of critical metals.

> *via nuclear power (63% of electricity production in 2023)*

Implementing new generation capacity will take a minimum of 8 to 12 years, which is a very long time compared with the rate at which fossil fuel consumption is set to decline. Moreover, nuclear power generation relies heavily on imported uranium, and generates radioactive waste that requires stringent storage conditions.

### • Reducing energy

> *through energy efficiency*

Energy sobriety means «consuming goods and services with a high environmental impact in moderation». In the 2022 energy sobriety plan, it is a lever for achieving both energy independence and carbon neutrality by 2050.

> *through energy efficiency*

To meet the population's needs for goods and services, while consuming less and less energy.

63%



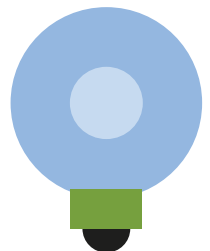
### Share of fossil fuels

(oil, natural gas and coal) mobilized for final energy consumption in France in 2022.

-39%

### Lower final energy consumption

between 2022 and 2050 to meet 2050 target of the national low-carbon strategy 2.



## METALLIC MINERAL RESOURCES: SHARPLY RISING NEEDS

In France, metallic mineral extraction is currently very low. In fact, most resources are imported.

While the extraction of metallic mineral has more than tripled worldwide over the past fifty years, prospective studies show that the energy transition will lead to an even greater increase in global demand for the metals required for low-carbon technologies (rare earths for offshore wind power and electric motors, lithium and nickel for batteries, etc.), with the need to develop new extraction, processing and recycling capacities.

In this context, **three main levers aim at reducing the need for critical resources** and thus becoming less dependent on imports:

- **sobriety**, by reducing the size of vehicles and associated batteries, and by promoting the development of means of transport other than the car;
- **the diversification** of battery chemistries, which can have a major impact on certain particularly critical materials;
- **recycling**, to meet long-term material needs (after 2040), subject to removal of certain obstacles (limiting losses, developing the necessary processing capacities, etc.).



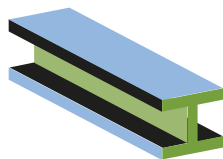
# 88%

### non-metallic minerals

used in France are extracted from its territory in 2022.

# 99,7%

of the **metallic mineral resources** used in France are imported.



## NON-METALLIC MINERALS: MOSTLY LOCAL EXTRACTION

Non-metallic minerals include:

- industrial minerals: andalusite, kaolin, talc, etc.;
- construction minerals: aggregates, solid rock, ornamental rock, etc.

France's requirements for non-metallic minerals are mainly met extracting the materials available on its territory. However, the number of French quarries and the volumes extracted from them have fallen sharply since the mid-2000s. The result is a growing reliance on imports.



### Building and infrastructure: how to respond to aggregate requirements?

Two complementary solutions to gravel pit closures:

- **Marine aggregates**, of which France has significant resources, have been growing steadily over the past ten years.

However, their exploitation has a negative impact on fauna, swell dynamics and seabed currents. It is therefore strictly regulated.

- **Recycled aggregates**

They cover a quarter of France's aggregate requirements. Some 90% comes from road stripping, while concrete recycling remains complex. By 2022, only half of all construction and public works waste had been recycled. The law envisaged 70% by 2020.



## BIOMASS: A RENEWABLE RESOURCE, BUT NOT WITHOUT ENVIRONMENTAL CONSEQUENCES

Biomass covers organic, non-fossil matter of biological origin (animal or plant): crops and their residues, grazed biomass (grass), wood and animals other than livestock (fishing, hunting). It has a wide range of uses: food, construction, chemicals, energy...

In France, plant biomass production is generally in surplus. Even if this is a renewable resource, its production is not without consequences for the environment.

For example, certain agricultural practices can accelerate soil erosion and mudslides during extreme precipitation events. Similarly, the discharge of toxic substances (plant protection products) or excess nutrients (fertilizers, animal waste) can lead to water pollution. Finally, biomass production requires mineral or fossil resources and, above all, available land.

***"By allowing a territorial specialization of agriculture, with cereal-growing arable regions without livestock and intensive livestock farming regions, dependent on imports to feed their herds, fertilization based on the application of synthetic nitrogen fertilizers has led to a breakdown in the age-old complementarity between agriculture and livestock farming".***

Gilles Billen, CNRS Emeritus Research Director, Territorial Biogeochemistry, Sorbonne University

Read his full interview in the full version of the State of the Environment Report.

## Water: a resource under strain

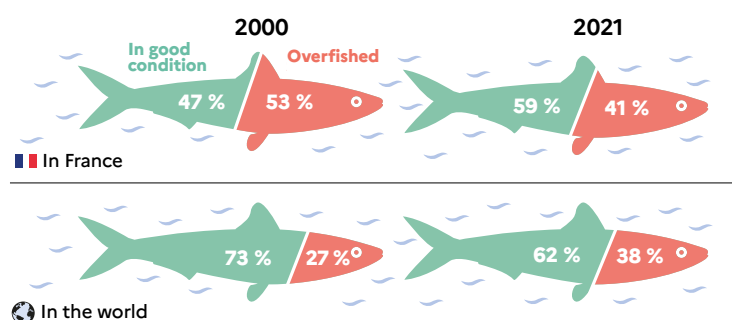
Between 1990-2001 and 2002-2022, water resource fell by 14%, due to both an increase in the volume of water returning to the atmosphere (evapotranspiration) and lower annual precipitation since 2002.

Over the years, soil drought has affected an increasing proportion of the French territory, indicating that the proportion of water naturally available to plants is decreasing, including for crops. While there is currently no chronic shortage of water, access to

water is not guaranteed year-round and everywhere. Local consultations are therefore regularly held to adapt needs to available resources. Over the period 2012-2022, water restrictions affected at least 30% of the territory on eight times. In 2022 (an exceptional year), 97% of mainland France was affected by restrictions on the use of surface water, and 27% by restrictions on the use of groundwater.

FOCUS

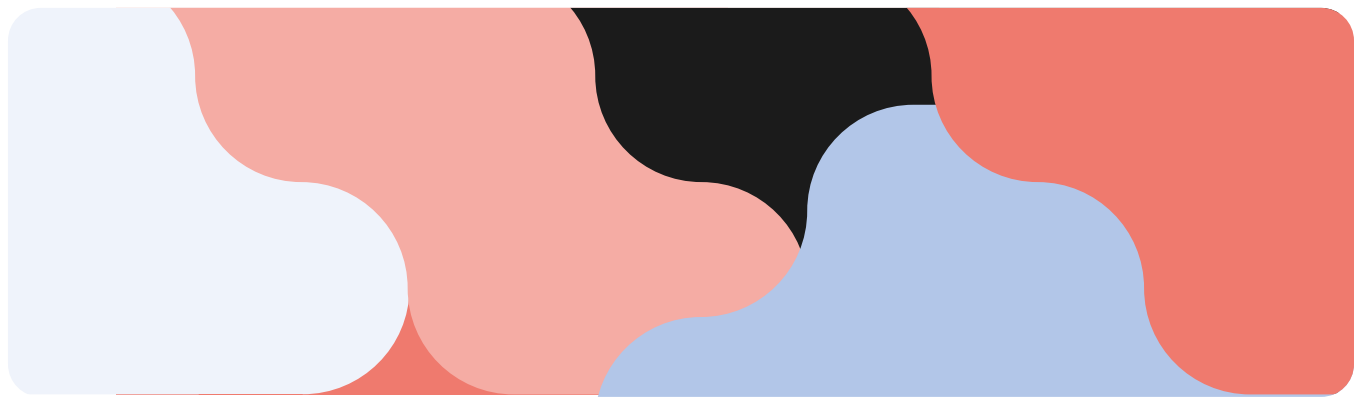
### How the state of fish stocks is evolving?



Source: SDES, based on FAO data, except for 2000 in France where an estimate was made, using Ifremer data, whose methodology is slightly different of that of the FAO

# Pollution of natural environments

## A threat to the environment and health



In France, all natural environments are affected by pollution, whether it is air, soil or water.

Mainly linked to human activities (agriculture, industry, transport, etc.), pollutants accumulate in ecosystems and represent a threat to biodiversity and human health.

While some types of pollution have been monitored for decades, less closely monitored pollutants are attracting increasing attention thanks to improved laboratory detection capabilities. These growing risks underline the urgency to step up prevention and impact reduction measures.

### TO REMEMBER

**Significant improvement in outdoor air quality to be pursued,** to better protect human health.

**A decline in sales of the most toxic plant protection products,** but stagnation of total sales and widespread contamination throughout country.

**Presence of plastic plants in natural environments.**

**Contamination of water through medicine residues of perfluorinated,** source of growing concern for public health and ecosystems.

**An increase in expenditure to fight against drugs and pollution,** lower than the costs supported by the society (health costs, loss of biodiversity, declining agriculture yields).

## POLLUTANTS THAT HAVE BEEN MONITORED FOR A LONG TIME, WITH REDUCTION TARGETS

Many air, soil and water pollutants have long been monitored for their harmful effects on health and the environment. Public authorities have introduced measures to reduce these emissions.

### Metals and metalloids: a downward trend in emissions

Emissions into outdoor air of metals and metalloids, such as cadmium and lead, have fallen overall since 1990, with a notable reduction of 69% for arsenic and 90% for mercury. However, copper emissions, mainly from transport, increased by 15% from 1990 to 2019, before returning to near-1990 levels by 2023. Since 2015, air concentrations of arsenic, cadmium, nickel and lead have been below European thresholds, with the exception of one or two measurement points for nickel.

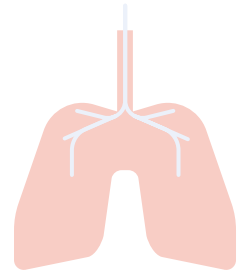
As far as soils are concerned, human activities in the 20<sup>th</sup> century have contributed to an increase in heavy metal levels, particularly in the Île-de-France region and the north of the country. Of the 2,200 points in the French quality monitoring network, 16% have arsenic levels above the vigilance threshold, including one that poses a risk of overexposure for local populations.

### Air pollution: a significant drop, but more progress needed to protect health

Between 2000 and 2023, emissions of most atmospheric pollutants have fallen, the result of action plans initiated several decades ago, with a 56% drop in fine particulate emissions (PM<sub>2.5</sub>).

While overall outdoor air quality is improving, regulatory air quality standards health protection are still not being met everywhere. Thus, in 2023, exceedances of standards for NO<sub>2</sub>, O<sub>3</sub> and PM<sub>10</sub> were observed, notably in some conurbations in the eastern half of mainland France, in Île-de-France and in Mayotte.

**7%**  
of total mortality in  
France is due to exposure to  
fine particles in outside air.



### Food pollutants: vigilance needed for children's health



In 2021, controls have shown that the majority of foodstuffs respect the maximum limits of contaminants (pesticides, medicines, residues of plastic, etc.), with less than 2% non-compliance for meat and 6 to 14% for plant products. However, increased vigilance is required for children, many of whom are exposed to levels of lead, polychlorinated biphenyls (PCBs) and furans that exceed toxicological reference thresholds.

### Air pollutants and greenhouse gases: what are the differences?



Atmospheric pollutants have a local impact on health and the environment, while greenhouse gases (GHGs) influence climate on a global scale.

However, air pollution and climate change are linked, as the substances involved come from common sources such as industry, transport, agriculture, etc. Ozone (O<sub>3</sub>) and particles, for example, affect both air quality and climate. In turn, climate change can exacerbate certain types of pollution: heat waves amplify O<sub>3</sub> pollution, and forest fires increase particulate pollution. Methane, a powerful GHG, also contributes to maintaining high O<sub>3</sub> levels.

### Polycyclic aromatic hydrocarbons (PAHs): a threat to health

Emitted mainly by residential wood heating, PAHs are persistent pollutants present in air, soil and water. With a 27% reduction in PAH emissions into outdoor air, all sectors of activity combined, between 1990 and 2023, concentrations of benzo[a]pyrene, a tracer of the carcinogenic risk of PAHs, are generally in line with the regulatory threshold. A few exceedances of this threshold are observed in industrial zones or in areas where wood-burning is widespread (northern and eastern France).

### Green algae: a persistent scourge



The proliferation of green algae, encouraged by an excess of nitrogen and phosphorus, mainly from agriculture, is affecting the beaches of the west coast of France, particularly in Brittany. This phenomenon suffocates the marine environment and presents environmental and health risks, notably through the release of toxic gases such as hydrogen during decomposition. Between 2008 and 2021, seaweed covered an average surface area of 630 ha each year. Despite successive plans, the phenomenon remains uncontained.

### Noise: road traffic, the main source of exposure in urban areas

Overexposure to environmental noise has health, socio-economic and biodiversity impacts. According to the WHO, noise is the second most common environmental factor causing health damage in Europe, after air pollution. In France, over 13 million people are exposed to noise levels in excess of 55 dB(A) during the day, and 7.8 million are exposed at night to noise levels in excess of 50 dB(A) from road, rail and air traffic.

### Radio frequencies: uncertain but monitored impact

Electromagnetic radiation emitted by telephones, base stations and power lines is omnipresent. In 2021, limit values were exceeded in France, but uncertainties about long-term effects persist. Radio frequencies are classified as "possible carcinogens" by the IARC, and research into their health effects continues.

### FOCUS

### Pesticides: mixed results

Despite successive plans to reduce pesticide use, France remains dependent on these products. In 2022, 68,600 tonnes of pesticides were sold. Sales of the most toxic pesticides fell by 35% between 2015 and 2022, and those used in organic farming or biocontrol increased. Following the detection of S-metolachlor, an herbicide classified as a suspected carcinogen, in the drinking water consumed by 1.2 to 2.2 million people, its use has been considerably restricted.

## CONTAMINANTS THAT ARE STILL LITTLE MONITORED, YET VERY PRESENT

Plastic waste, medicinal residues and perfluorinated compounds contaminate natural environments, threatening biodiversity and human health. Although monitoring is not yet systematic, action is gradually being taken.

### Plastic waste: worrying signals for ecosystems and health

Hundreds of animal species are affected by the ingestion of plastic debris. For humans, several studies have observed the presence of microplastics in the lungs, blood and feces. However, the link between exposure to microplastics and health effects remains poorly understood.

**In 2022, only 23% of single-use plastic packaging was recycled in France. French law targets 100% recycling by 2025.**



17000 to 88000

floating micro-plastics at sea

per km<sup>2</sup> on average, between 2015 and 2020,  
in mainland France.

**"Combined between them, the non-genetic environmental risk factors [single or mixed chemical substances, infectious agents, noise and light pollution, etc., as well as the psychosocial and socio-economic situation risk factors], can have a significant impact on our health. They make up the exposome, a footprint of a lifetime's exposures. The research challenge is to characterize an individual's exposome and measure their cumulative and combined effects on the occurrence of disease."**

**Robert Barouki**, Professor at Université Paris Cité, Director of Research at Inserm, corresponding member of the French National Academy of Medicine

Read his complete interview in the full version of the State of the Environment Report.

**1,8%**

**of GDP has been earmarked for pollution control** in 2021.

These expenses are financed by public administrations, companies, households and EU

**46** Bn€



**4** drugs monitored on a large scale in rivers and lakes have been quantified in over 25% of analyses between 2019 and 2021.

#### **PFAS: "eternal pollutants" with little-known effects**

Perfluorinated substances (PFAS), used in numerous industrial and consumer products (kitchen utensils, textiles, etc.), are found in water, soil and organisms. They are a possible cause of endocrine disruption and some cancers. Over the period 2019-2021, 40% of water analyses from rivers and lakes revealed the presence of at least one PFAS. For groundwater, the rate was around 20%.

Among the most persistent in the environment, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are the best known. In a Santé Publique France study, these two substances were found in 100% of children and adults monitored.

#### **Drug residues: a proven water contamination**

Drug residues, often not eliminated by wastewater treatment plants, are increasingly present in rivers and groundwater. Between 2019 and 2021, eight drug substances have been identified in rivers, including carbamazepine (an antidepressant and antiepileptic), and sulfamethoxazole (an antibiotic).

## **PUBLIC ACTION AGAINST POLLUTION: RESOURCES TO BE STRENGTHENED**

In France, numerous measures are in place to combat environmental pollution and limit health risks. However, these measures remain insufficient in view of the health-environment issues at stake and the overall cost of pollution to society.

#### **Action and regulations: results fall short of stated ambitions**

The Cour des Comptes (French Audit Office) and the Autorité Environnementale (French Environmental Authority) highlight the inadequacy of current public policies to reduce pollution. Despite efforts in the industrial and transport sectors, shortcomings persist in the residential, tertiary and agricultural sectors. The new European directives on air, drinking water and urban wastewater, call for these actions to be stepped up.

#### **Increasing investment, but a much higher social cost**

Over the period 2000-2021, the budget devoted to pollution control has risen steadily. However, this spending, significant, does not cover all the costs borne by society, particularly in terms of increased healthcare costs, loss of biodiversity, lower agricultural yields, deterioration of buildings, etc. For example, air pollution costs to society between 70 and 100 billion euros a year, whereas expenditure to protect outdoor air quality amounts to around 8 billion euros a year.

# Climate change

## Increasingly perceptible effects



● The impacts of climate change are becoming increasingly tangible, both for natural balances and human health.

With scientists predicting a global warming of +3°C (+4°C for France) by the end of the century on current global policies, these upheavals are set to get even worse.

Against this backdrop, climate issues are increasingly present in public debate and are subject of international commitments.

Progress is also being made in France, with reductions in greenhouse gas emissions and in the carbon footprint of the French population. Nevertheless, individual and collective action needs to be stepped up to both tackle global warming and adapt to its consequences.

### TO REMEMBER

**Consequences of climate change increasingly perceptible in France:** rising temperatures, droughts, floods, fires, forest fires, storms, coastal erosion, etc.

**An increase of the frequency and intensity of extreme weather events** due to the global rise in the concentration of greenhouse gas emissions in the atmosphere.

**Human health and habitability of territories increasingly threatened** by these upheavals.

**A responsibility of France in global warming,** particularly through consumption of fossil fuels, main cause of climate change.

**A higher consideration of climate challenges,** but actions to reduce greenhouse gases emissions and adapt must be further amplified.

## A CONCRETE REALITY WITH A REAL IMPACT ON ENVIRONMENT AND HEALTH

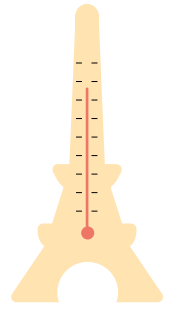
In France, the effects of climate change are already being felt:

- rising temperatures;
- melting glaciers and shrinking snowpacks;
- modification of certain natural rhythms: earlier migration dates for certain birds, expansion of the pine processionary caterpillar, rise in lake and river temperatures with a significant impact on fish reproduction, etc.;
- disruption of the water cycle: increased surface area affected by annual droughts in mainland France, but also rising sea levels;
- shifting agricultural harvests: bringing forward the date of the grape harvest or sowing corn or wheat.

In addition to these effects on the environment, there are also numerous direct and indirect impacts on health (excess mortality linked to intensification of heatwaves, exacerbation of allergies, respiratory problems due to increased concentrations of pollutants in the air, mental health problems, etc.).

# + 1,9°C

**Increase in average  
temperature  
2013-2022 in France**  
compared with the previous  
period 1900-1930.



## A WORRYING OUTLOOK FOR THE FUTURE

The climate of the next few years is determined by the greenhouse gas emissions already released into the atmosphere and those to come. Scientific models present scenarios of temperature increases ranging from +1.4°C to +4.4°C by the end of the century compared with the preindustrial era.

As a reminder, complying with the Paris Agreement, which targets an increase of +1.5°C by 2100, implies emitting no more CO<sub>2</sub> than the carbon sinks can absorb within the next 30 years (i.e. carbon neutrality) and significantly reducing other greenhouse gases.

With the current climate policies of each country, global warming is expected to reach around +3°C by the end of the century, or +4°C for France.

This rise in temperature will be accompanied by increasingly frequent and intense extreme weather events (droughts, heatwaves, heavy precipitation, cyclones, etc.) due to the concentration of greenhouse gas emissions in the atmosphere.

### You said "Climate change?"



"Climate change" refers to long-term variations in climate at a global scale. Cause: increasing concentrations of greenhouse gases in the atmosphere.

We also talk about "global warming", but this is only true in global and trend terms. Locally, this phenomenon can manifest itself in temperatures, precipitation and winds that change rapidly and very differently from country to country, region to region and season to season. It is therefore a "climate upheaval" that humanity is facing.

#### NOTA BENE

Some impacts are already considered irreversible. These include rising sea levels, which will continue for several centuries, and the melting of ice at the poles.



## 2023

**Warmest year** since  
temperatures are recorded.



## An increase in extreme weather events

On a global scale, a drought that occurred on average once every ten years in 1900 could occur four times as often in 2100, with global warming of + 4°C, and an exceptional one-day precipitation event two to three times as often.

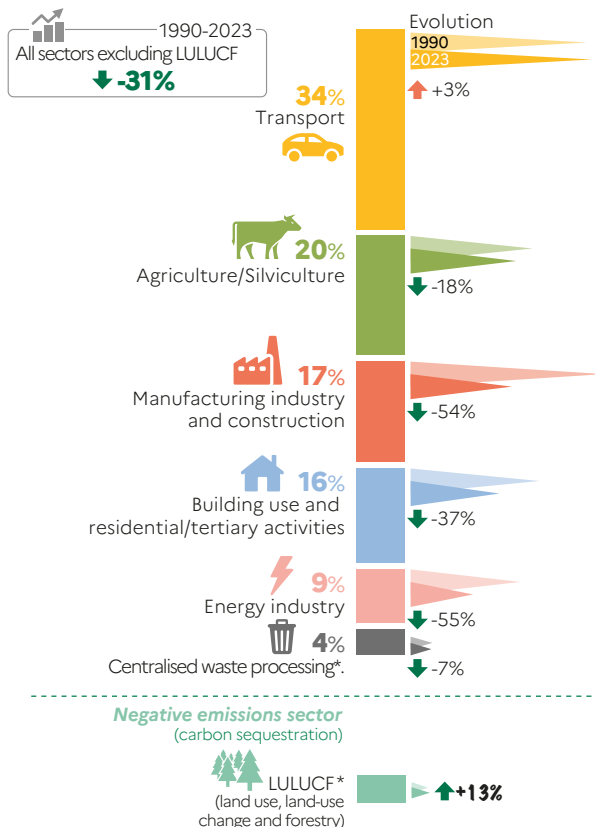


**Average rise in sea levels**  
between 1990 and 2023.

## GREENHOUSE GAS EMISSIONS: REDUCTION SINCE 1990

Territorial greenhouse gas emissions fell by 31% overall between 1990 and 2023. However, results vary from one sector to another.

### Which sectors emit the most GHGs in France?



\* 2022 values are used for 2023.  
Source: SDES, based on Citepa, Secten format, June 2024

## The French carbon footprint: a certain decline

The carbon footprint measures the impact of a country's consumption on the climate. For each French person, it will average 9.4 t CO<sub>2</sub> eq in 2023. Over the last decade, it has been declining.

Indeed, taking into account the increase in population over the period, the carbon footprint average per capita is 26% lower than its level in 1990.

However, this reduction is insufficient to comply with the Paris Agreement: the current average carbon footprint per person should be divided by five by 2050-2070.

**NOTA BENE** France's per capita carbon footprint is lower than that of the European Union and China, and half that of the United States or Saudi Arabia. On the other hand, it is much higher than the average worldwide (+50%).

FOCUS



## FIGHTING CLIMATE CHANGE: WHAT LEVERS FOR ACTION?

Since the early 2000s, France has been pursuing an energy and climate policy aimed at reducing its greenhouse gas emissions. The aim is to achieve carbon neutrality by 2050, which means cutting gross emissions by at least a factor of six compared with 1990 levels.

**NOTA BENE** By 2023, emissions were falling by 31% compared to 1990 levels. To meet the target of a 50% reduction in emissions by 2030, emissions are expected to fall by 4.5% a year over the next seven years, a lower rate than in 2023 compared with 2022 (-5.8%), but twice the annual rate of decline seen since 2010.

**"Adaptation possibilities are conditional to rapid mitigation of GHG emissions. The more the climate warms up, the less it will be possible to adapt. We therefore need to act quickly on these two levers (adaptation and mitigation)."**

Gonéri Le Cozannet, researcher at BRGM, co-author of Part II of the 6(th) IPCC report, member of the French High Council for Climate.

Read his complete interview in the full version of the State of the Environment Report.

## What to do? Three examples of levers for combating climate change



### Agriculture

#### The 4 for 1,000

An annual increase of 0.4% in the carbon content in the top 30 centimetres of soil would halt the rise in CO<sub>2</sub> concentration in the atmosphere. The 4 for 1000 initiative, launched by France at the COP21 climate summit in 2015, aims to federate voluntary public and private players to launch actions on soil carbon storage.

### Nature

#### Nature-based adaptation solutions

These aim to protect and restore natural ecosystems, relying on their natural functioning to adapt to the effects of climate change, while having a positive impact on biodiversity. For example, a river that regains its natural meanders and vegetated banks can overflow its bed and this helps to absorb upstream flooding, while promoting fish spawning grounds. The long-term cost/benefit ratio is generally more attractive than building artificial infrastructures.

### Financial incentives

#### Effective carbon pricing

Taxes on energy and waste, as well as European emission quotas, create an incentive to reduce emissions. Within OECD, these policies are referred to as "effective carbon pricing".

In France, in 2023, greenhouse gas emissions are subject to an effective carbon pricing of €91/t CO<sub>2</sub> eq on average, with strong heterogeneity according to sectors and players.

## Annual amount spent to tackle climate change

in France, by households, companies and public administrations in 2022.

100 Bn€



## Level of warming in mainland France by 2100

taken into account by the reference warming trajectory for adaptation to climate change in France (TRACC) to draw up national adaptation policies.

# Biodiversity

## Nature under pressure



France, with its overseas territories, is home to an unparalleled wealth of biodiversity, making it one of the richest countries in the world terms of species and ecosystems. To-day however, these ecosystems are threatened by many pressures exerted by human activities.

Intensive agriculture, urbanization, pollution, overfishing, etc.: these actions are profoundly altering ecosystems, endangering plant and animal species and the essential services they provide.

In this context, restoring natural environments and protecting species are crucial issues.

### TO REMEMBER

**Knowledge of species and habitats constantly improving**, for better action.

**A continuous erosion of biodiversity in France**, despite initiatives at national and international scale and protection programs, as well as individual success stories.

**An absence of significant reduction in the five main pressures** responsible of biodiversity loss, some of which are intensifying.

**One third of the French territory covered** by at least one system for protection of nature areas.

**Issues related to biodiversity** better taken into account at all levels citizen.

## FRENCH BIODIVERSITY: AN ENDANGERED TREASURE

France is home to an exceptionally diverse natural heritage, giving it a particular responsibility to protect it. Knowledge of this biodiversity continues to improve, with new species being discovered every year, such as the spiny dogfish (shark) of Reunion Island and the wild cat of Corsica.

However, in the face of multiple human-induced pressures, animal and plant populations that can no longer demonstrate resilience tend to decline.

- **Species extinction:** France ranks 10<sup>th</sup> among countries with the highest number endangered species. For example, 66% of different butterflies have not been seen for twenty years in at least one of the French departments they used to occupy.
- **Reduced species populations:** insect populations, particularly pollinators, are in steep decline, mainly due to pesticide use and habitat loss. This decline has a direct impact on agriculture, where 70% of species grown for human consumption depend on animal pollination, and insects in particular.

### NOTA BENE

Reflecting the deterioration in biodiversity, the risk species extinction has doubled in mainland France over the last twenty years.



# 10%

of the species observed worldwide are found in France, i.e. 104,172 species in mainland France and 96,629 in overseas France.

# 11%

of the species found in France are endemic, i.e. 22,775 species (of which are overseas).



## THE FIVE PRESSURES RESPONSIBLE FOR BIODIVERSITY DECLINE

Biodiversity is under increasing pressure, mainly from five major factors. These factors act simultaneously, and sometimes synergistically, amplifying the pressures on species.

### Five examples of biodiversity damage in mainland France

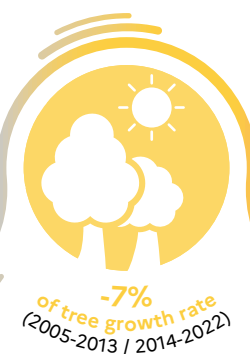
**Destruction of natural environments**



**Overexploitation of resources**



**Climate change**



**Pollution**



**Invasive alien species**



## HOW ECOSYSTEM DEGRADATION AFFECTS OUR FUTURE

The progressive decline in biodiversity impacts not only the environment, but also society and the economy, which benefit from the many advantages provided by ecosystems.

### Trees in the city: under-represented allies

With the exception of a few cities, France's major urban areas are not sufficiently endowed trees. In 2023, the Île-de-France region had two trees per inhabitant, and Paris intra-muros only 0.2 trees, compared with a national average of 182 trees.

→ Without more trees in the city, the ability to mitigate the effects of heat waves, reduce air pollution and provide green spaces is compromised, to the detriment of public health and the comfort of city dwellers.

### Agriculture: soil under pressure

The use of pesticides and chemical fertilizers, combined with monoculture, has led to a loss of biodiversity in agricultural areas and soil degradation in some regions. Between 1950 and the present day, the area of permanent grassland has shrunk by 27%, and the length of hedgerows by 70%.

→ These degradations affect soil fertility, water and crop resilience to climatic hazards, jeopardizing agricultural sustainability and long-term food security.

### A forest of underestimated value

Although forests are under threat worldwide, forest area in mainland France has been growing steadily since the end of the French Revolution. Moreover, tree species diversity has increased by 18.9% in ten years. However, forests are facing the effects of global warming. Between 2013 and 2023, around 9,000 hectares of forest were ravaged by fire every year.

→ Forest health threatens the capacity of the forest environment to absorb carbon.

### Wetlands: natural regulators under threat

Considered to be first-rate buffers against the effects of climate change, wetlands (marshes, floodplains) feed groundwater and rivers, delaying the effects of drought and preserving water resources.

→ Although peatlands are the main carbon sinks, covering just 0.2% of France's surface area, they store 0.5 t CO<sub>2</sub>/ha each year. Their disturbance or degradation would release a reference stock in France estimated 3,214 t CO<sub>2</sub>/ha destroyed.

## FOCUS

### The fragile balance of ultramarine ecosystems

Characterized by a remarkable ecological richness, the ecosystems of the French overseas territories need to be adapted. Their geographic isolation makes them both unique and fragile. Faced with growing intensity of their ecological balances are called into question.

- **62% of coral reefs are degraded in the French West Indies and Indian Ocean (Mayotte, La Réunion)**, affected by global threats such as ocean warming.

- **40% and 65% of mangroves on Saint-Martin and Saint-Barthélemy have disappeared**, while those on Guadeloupe have increased by 19% since 1950.

- **30% of the world's seagrass beds have been destroyed** since the 19<sup>th</sup> century, with the decline most evident in the Caribbean and Indian Ocean (particularly Mayotte).

- **1.5% of French Guiana's tropical rainforest was lost** between 1990 and 2020, mainly as a result of deforestation linked to mining and agricultural activities.

- **44% of Guiana's savannahs have disappeared** since 1950, and 41% of the remaining area is threatened by urbanization and the introduction of exotic species.



# 20%

**remarkable ecosystems**

are in a favorable conservation status in 2019.



# 4,2%

**of the national territory, both on land and at sea,** is covered by a strong protection system in 2024, compared with 1.8% in 2021.



# 3.3 Bn€

**mobilized in favour of biodiversity in 2021**, in particular for the restoration of the reintroduction of endangered species or the management of natural areas, 0.13% of GDP.

## Preserving marine ecosystems

With almost 11 million km<sup>2</sup> (97% of which are overseas) and a presence in all the world's oceans (except the Arctic), France boasts the world's second-largest maritime domain. However, multiple pressures, combined with climate change, are fragilizing these ecosystems.

→ The degradation of marine environments jeopardizes our food security and the oceans' capacity to absorb carbon (a third of man-made emissions), exacerbating the effects of climate change and the loss of marine biodiversity.

## CONCRETE ACTIONS TO PRESERVE BIODIVERSITY

Faced with the decline in biodiversity, France has implemented series of measures to reverse the trend and preserve ecosystems. These measures aim to protect endangered species, restore mid-natural areas and control human activities likely to impact biodiversity.

- **National strategy for protected areas:** adopted in 2021, it sets ambitious protection targets for 2030, notably to protect 30% of the national territory, including 10% under strong protection. In 2024, France exceeded the first target: 33% of the national territory is covered by a protected area.
- **National Biodiversity Strategy 2030:** adopted in November 2023, it aims to reduce pressures on biodiversity and restore 30% of terrestrial and marine ecosystems. By 2050, France is also committed to halting the extinction of species caused by human activities.
- **National Action Plan (PNA):** France has set up more than 74 PNAs to conserve or re-establish a threatened wild species or a species of particular interest.

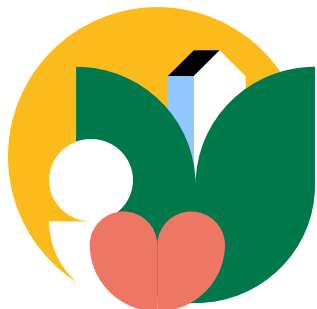
- **Species:** since 2007, 18 animal and plant species reintroduction experiments have been carried out in national parks.
- **Combating the illegal trade in species:** as part of the CITES convention, France is involved in controlling the international trade in endangered species. Regular operations have led to the dismantling of trafficking networks and the seizure of rare species.
- **Taking biodiversity into account in development projects:** since the adoption of the law for the reconquest of biodiversity in 2016, development projects must follow the "avoid, reduce, compensate" principle in order to limit impacts on biodiversity. Concrete measures, such as wildlife crossings (over 1,800 counted on the Vinci freeway network, for example), enable fragmented habitats to be reconnected.
- **Green and blue framework:** the green and blue framework aims to reconnect terrestrial and aquatic environments to preserve biodiversity. To date, 29% of France has been identified as a biodiversity reservoir, including 50,717 km of ecological corridors and 271,180 km of waterways.

***"For forty-five years, the conservatories of natural areas have been preserving and enhancing the natural and landscape heritage around territorial projects with a method based on citizen, professional and public consultation."***

**Bruno Mounier**, Director of the Fédération des conservatoires d'espaces naturels, and **Pierre Mossant**, Director of the Conservatoire d'espaces naturels d'Auvergne

**Read their complete interview** in the full version of the State of the Environment Report.

# A shared challenge



## Mobilize the whole society for the future of the planet

Preserving our planet calls for a general mobilization, involving public authorities, economic players and citizens alike. Environmental challenges, whether in terms of sustainable use of resources, reducing pollution, combating climate change or protecting biodiversity, can only be met through collective mobilization.

In France, numerous initiatives already exist, such as action plans for biodiversity actions to encourage mobility that emits less greenhouse gas, regulations to reduce pollutant emissions, etc. However, the scale of the challenges is such that we need to go further.

Throughout the report, examples illustrate the diversity of forms of commitment to the environment, at both local and national level, both overseas and in metropolitan France. Whether driven by citizens, industrialists, farmers, associations or public authorities, these dynamics adapt to a variety of contexts.

***"To support transitions, the challenge is less to circumvent the problems of social acceptability than generating support choices that can have sometimes difficult consequences for citizens, businesses and the general public or the agricultural world."***

**Brice Huet**, General Commissioner for Sustainable Development

Read his complete interview in the full version of the State of Environment Report

***"To be socially acceptable, the green transformation in Europe and in France must be equitable, and avoid the emergence or aggravation of inequalities between people and nature."***

**Leena Ylä-Mononen**, Director of the European Environment Agency

Read his complete interview in the full version of the State of Environment Report

The ecological transition can give rise to reluctance, as it induces socio-economical transformations and upsets certain habits in terms of food, daily mobility or housing. If we are to mobilize the various components of society and face up to environmental challenges, past experience shows that we need to inform, discuss and build appropriate solutions together, anticipate the indirect consequences of transitions on human activities, innovate to invent a new economic model that is more respectful of the environment.



## DISCOVER THE FULL REPORT ON THE STATE OF ENVIRONMENT IN FRANCE

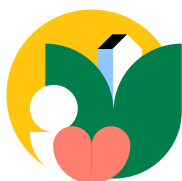
### Would you like to find out more about environmental challenges?

- Download the full report and access additional resources (videos, infographics, podcasts, etc.)
- Explore detailed analyses of biodiversity, natural resources, climate change and pollution

### Why consult the report?

- **The state of the** environment in France
- **Figures and case studies** to better understand the issues at stake
- **Infographics and graphs** to visualize trends
- **Spotlight on local** environmental initiatives
- **Outlook to better anticipate** future challenges

Go to [notre-environnement.gouv.fr](https://notre-environnement.gouv.fr)  
to access all content.



**THE 2024 EDITION OF THE STATUS REPORT OF THE ENVIRONMENT IN FRANCE** is designed to make it easier to understand and grasp the main findings in the face of today's climate and environmental challenges.

An overview of the French environmental situation is provided, structured around four sections, each of which deals with a specific issue, an environmental challenge: depletion of natural resources, pollution of natural environments, climate change, declining biodiversity.

Although treated separately, these four issues are of course highly interrelated: the extraction of natural resources is a source of pollution for natural environments, which in turn contributes to climate change, one of the factors exacerbating the decline in biodiversity.



**MINISTRY  
OF THE ECOLOGICAL  
TRANSITION,  
BIODIVERSITY,  
FORESTRY, SEA  
AND FISHERIES**

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