

# Climate Change

**Extract from France's 2021 Environmental Performance Review**



# Climate Change

**Current and future climate change has no historical precedence. Impacts affect the entire environment: atmosphere, land, oceans and cryosphere. These upheavals are already affecting human life, forcing us to adapt. Some of the changes would require centuries to reverse, however massive global reduction in greenhouse gas (GHG) emissions could stop or mitigate some impacts.**

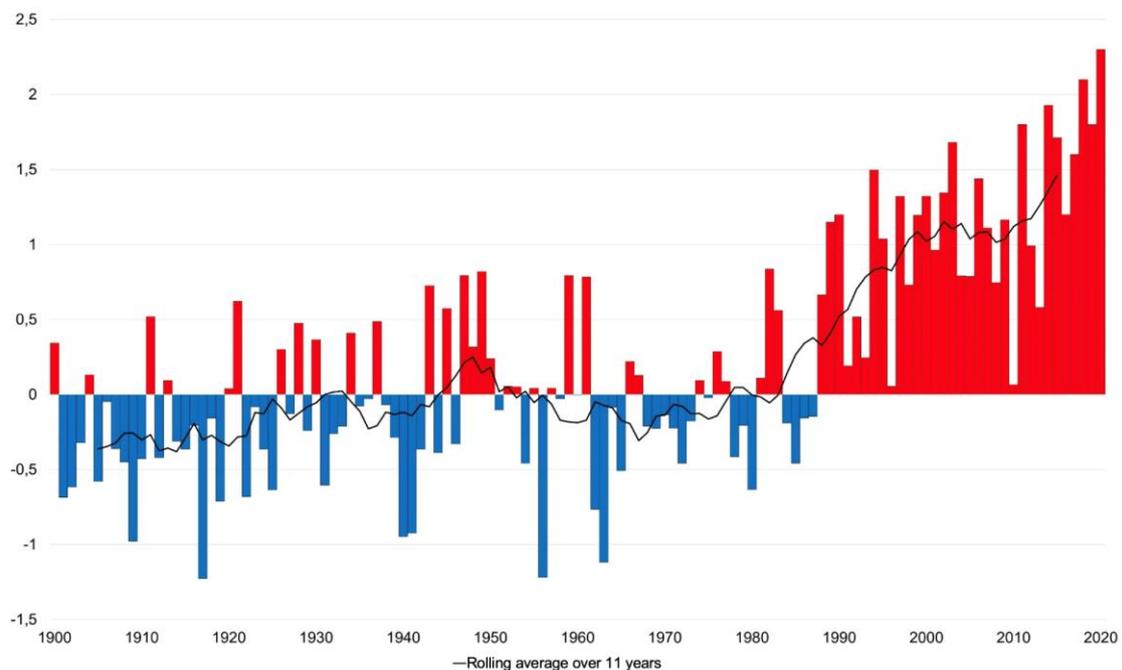
## THE INFLUENCE OF HUMAN ACTIVITIES IN CLIMATE CHANGE IS WITHOUT DOUBT

The Earth absorbs part of the energy it receives from the Sun, using GHGs naturally present in the atmosphere. This phenomenon makes life possible on Earth. Without this natural “greenhouse effect”, the average temperature of the planet would be around -18°C. GHGs are key for climate regulation. However, since pre-industrial times, global concentration of GHGs generated by human activities have increased significantly and the greenhouse effect is growing. The increase in energy stored by the Earth has an impact on balances determining the current climate. There is no doubt about the influence human activity has on increasing GHG emissions in the atmosphere, particularly the consumption of fossil fuels (Intergovernmental Panel on Climate Change, 2020).

## INCREASE IN AVERAGE TEMPERATURES AND RISING AVERAGE SEA AND OCEAN LEVELS

Between 1900 and present, warming reached about 1.4°C in Metropolitan France, higher than the world average of +1.1°C. The temperature has risen at a varied rate, with a particularly marked increase since the end of the twentieth century. The trend has been about +0.3°C per decade since 1980. With a deviation of +2.3°C of the average between 1961 and 1990, 2020 was the warmest year ever recorded in Metropolitan France. Previous records date back to 2018 and 2014 (Figure 1).

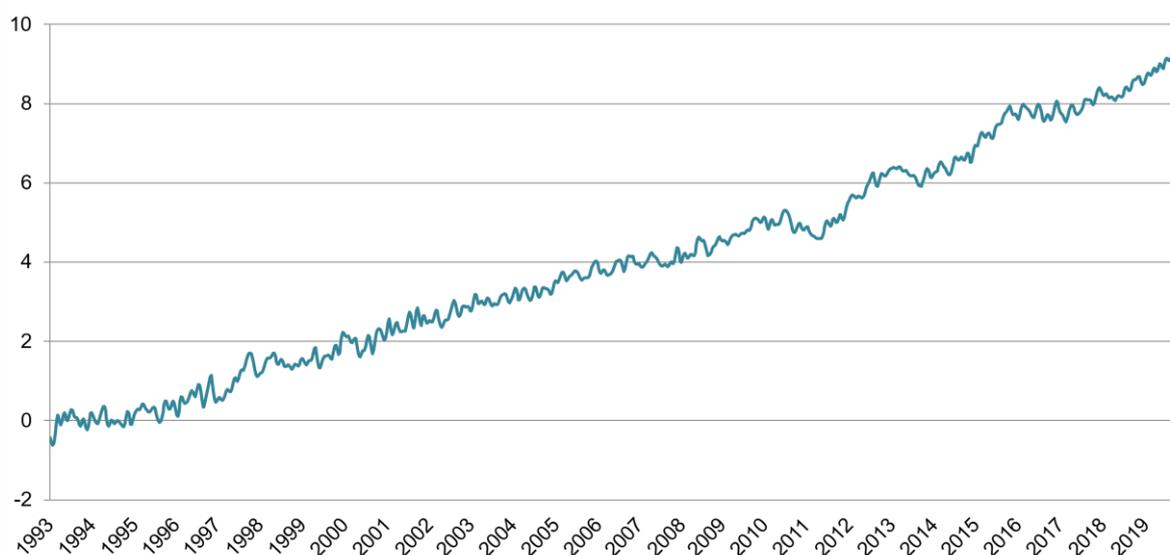
**Figure 1: Deviation from normal\* average annual temperatures in Metropolitan France**  
In °C



\*normal = average 1961-1990.  
Source: Météo-France, 2021

The melting of ice caps and mountain glaciers and the expansion of the oceans because of global warming are increasing the average level of the seas and oceans. The level increased by 0.2 metres between 1901 and 2018. The sea level rose on average by 1.3mm per year between 1901 and 1971, to 1.9mm per year between 1971 and 2006, and by 3.7mm per year between 2006 and 2018 (Figure 2). These averages mask specific increases in sea level due to the effect of waves and tides, vertical bedrock displacements, geological characteristics, and land subsidence due to groundwater pumping.

**Figure 2: Trends in average sea level since the end of the twentieth century**  
In cm



Sources: U.E. Copernicus Marine Service Information/Copernicus Service, 2020

### PHYSICAL IMPACTS THREATENING SOCIETY

The physical effects of climate change alter hydrological and meteorological conditions (water cycles, increased droughts and rainfall events, etc.) and disrupt ecosystems (harvest dates, bird migration, ocean acidification and coral reef degradation, etc.). These environmental changes affect human life and the economy in different areas. The health of 62% of the French population is estimated to be highly exposed to climatic risks. Tourism is hit by an average drop of 12% in snow cover on the French mountains compared to the average between 1981 and 2010. For agriculture, environmental changes have contributed to stagnation in common wheat yields after 35 years of growth.

Rising water levels are exposing coastal urban development to risks of submersion and coastal erosion. In France, 850,000 people live in areas with altitude below the height reached by the sea every one hundred years. Over 10.4 million houses are in areas of medium or high exposure to clay shrink and swell according to new risk zones identified by the French Elan law. These risks are exacerbated by the increase of droughts caused by climate change. In 2020, events due to drought are responsible for 73% of losses covered (except cars) by the natural disaster compensation scheme of around €1.1 billion (Map 1).

Map 1: Impact of climate change in France observed and predicted by 2050



Source: Observatoire national des effets du réchauffement climatique, November 2018

### THE EXTENT OF CHANGES TO COME DEPEND ON FUTURE GHG EMISSIONS

Global warming will continue over the next century - and is likely to exceed +1.5°C - regardless of future GHG emissions. The IPCC models different scenarios for temperature variations based on socio-economic hypotheses and GHG projections. By the end of the century, the global average temperature will have increased from +1.4 to + 4.4 °C. Given climate inertia, sea levels will continue to rise for several centuries, even after GHG emissions have stopped.

The frequency and intensity of extreme weather events, such as drought, heat waves, heavy rainfall and cyclones, will increase. Extreme temperature events that occurred once every 10 years in 1900 are likely to occur 4 times every 10 years with global warming of +1.5°C, and 9 to 10 times at +4°C.

### REDUCING GHG EMISSIONS AND ADAPTING TO ENVIRONMENTAL CHANGES

Two possible actions can limit damage likely to be caused by climate change: mitigation of GHG emissions and adaptation by society to the effects of climate change. For GHG mitigation, the national low-carbon strategy aims to reduce GHG emissions in France to achieve carbon neutrality and reduce the French population's carbon footprint by 2050. Apart from these long-term objectives, France must adapt to climate change effects that are inevitable due to the existing accumulation of GHG emissions. In 2018, France adopted a second national plan which includes necessary actions to adapt the country to anticipated climate change by 2050. At the same time, as part of regional climate-air-energy plans, local authorities are introducing local adaptation strategies. Some economic actors are also including a carbon price in their business strategies. This internal cost reflects financial risks such as future GHG taxes and the anticipation of a reduction in GHG allowances imposed on Europe's biggest emitters. It also takes into account reputational risks for companies linked to negative climate impact.

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## Fact Sheet: Climate Change

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The Institute for Climate Economics (I4CE) evaluated climate investment in France at €45 billion in 2020. Climate investment in France increased by 10% compared with 2019, however the increase is not homogeneous across all sectors. The increase is mainly observed in electric and hybrid cars while investments in housing energy renovation, railways, public transport and renewable energy production remain stable.

### FOR MORE INFORMATION

- [Chiffres clés du climat, France, Europe et Monde - Édition 2022](#), SDES and I4CE, *Datalab*, October 2021, 92pp.
- [Landscape of Climate Finance - I4CE](#)
- [Observatoire national des effets du réchauffement climatique - Onerc](#)