France

Progress in the net zero transition

EMISSIONS

2018 OECD average:	2018 French average:	French target:
11.5 tCO₂e/capita	7.0 tCO₂e/capita	net zero GHG emissions by 2050

Large regions (TL2)

Figure 1. Estimated regional greenhouse gas emissions per capita
Tons CO₂ equivalent (tCO₂e), large regions (TL2), 2018

tCO2e per capita
- 0-5
- 5-10
- 10-50
- 50+
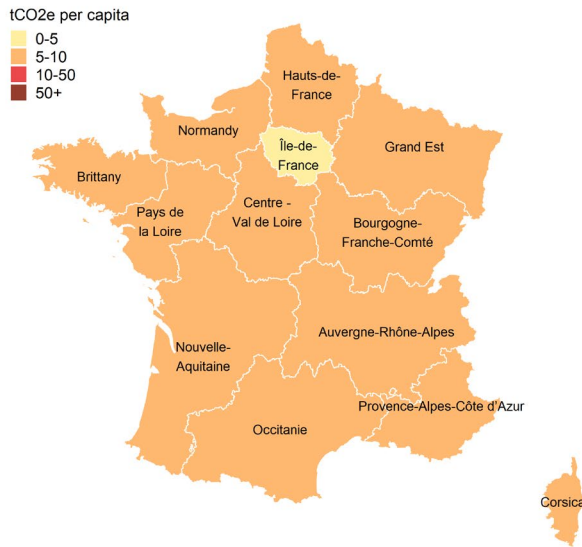
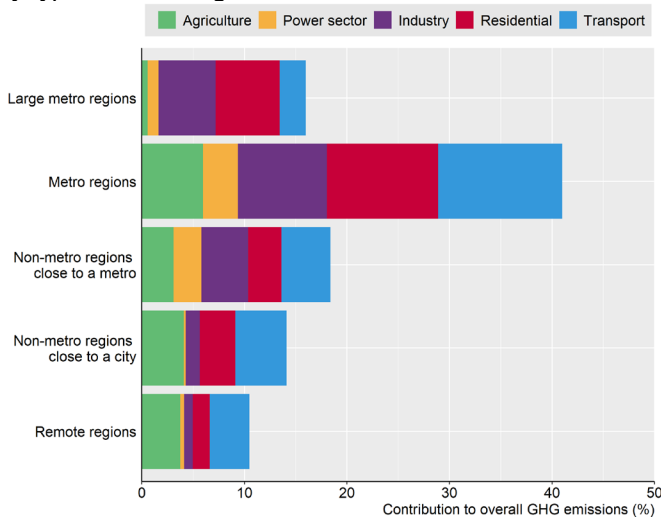Greenhouse gas (GHG) emissions per capita generated in all French large regions are below 10 tCO₂e per capita, and thus below the OECD average of 11.5 tCO₂e per capita.
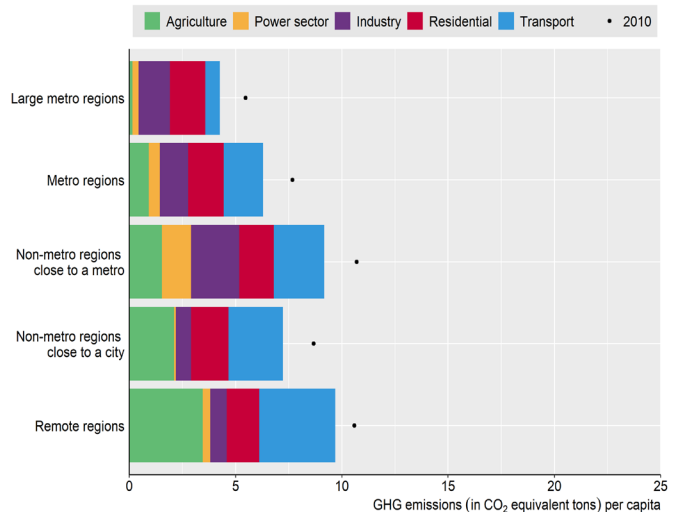
Estimated emissions per capita in Grand Est are almost three times higher than in Île-de-France.

Small regions (TL3)

Figure 2. Contribution to estimated GHG emissions
By type of small region, 2018

Figure 3. Estimated GHG emissions per capita
By type of small region, 2018

Across the OECD, metropolitan regions emit more greenhouse gases than remote regions. In France, a similar pattern can be observed. Emissions per capita in French remote rural regions are higher than in metropolitan regions. All region types have reduced emissions per capita between 2010 and 2018.
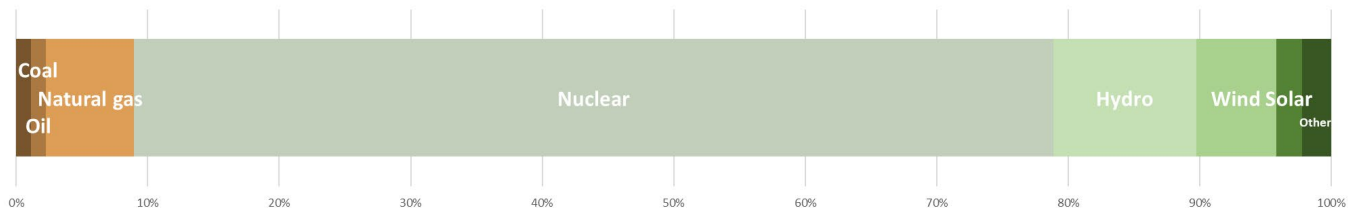
ENERGY

French electricity mix

Figure 4. National electricity generation by energy source in 2019

Share of coal-fired electricity generation

2019 OECD average: 23%	**2019 French average: 1%**	**2030 well below 2°C benchmark for the EU: <2%**
		2030 1.5°C benchmark for OECD countries: 0%

Figure 5. Regional coal-fired electricity generation estimates
Per cent of total electricity generation, large regions (TL2), 2017
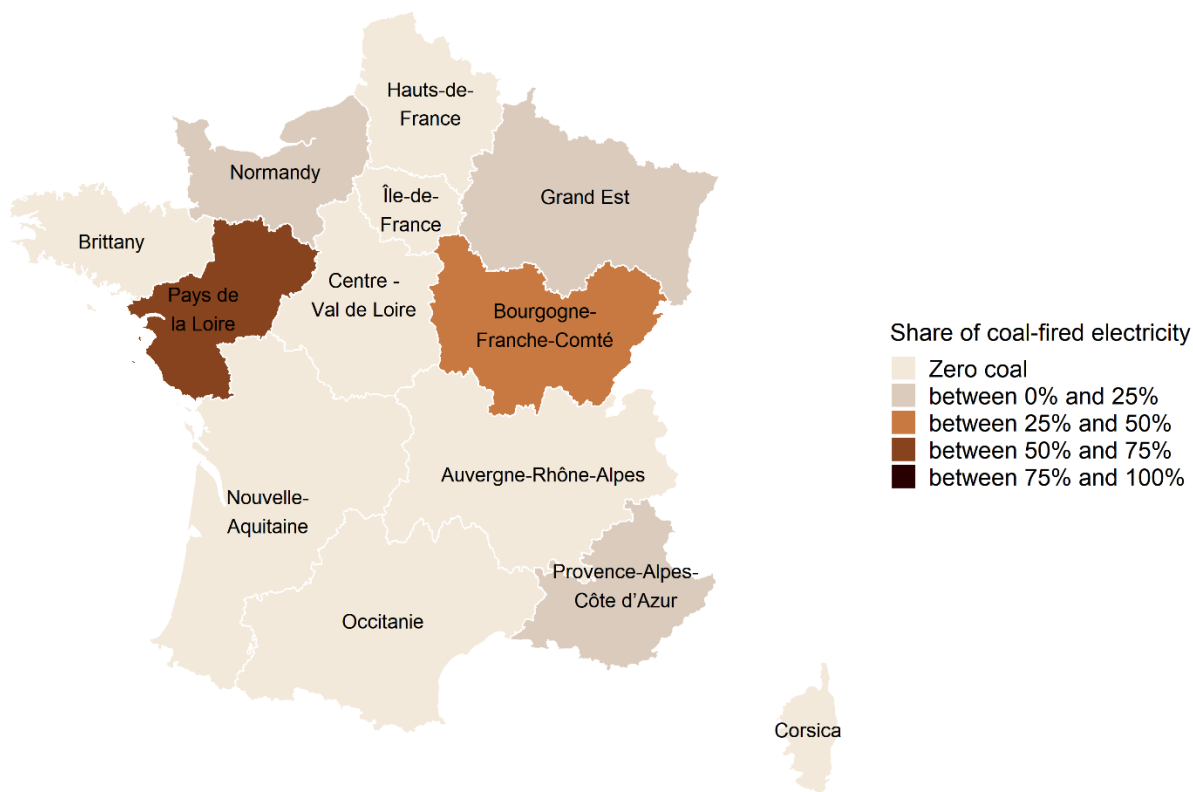
Most regions do not use coal in electricity generation. Only Pays de la Loire used coal for just over 50% of electricity generation in 2017. Coal-fired electricity generation has been declining steadily. No new capacity is planned or being built.

Wind power

2019 OECD average: 8%	2019 French average: 6%	2030 well below 2°C benchmark for the EU: >29%

Figure 6. Regional wind power generation estimates
Per cent of total electricity generation, large regions (TL2), 2017

Regional wind electricity generation is estimated using facility level data for 68% of France's wind capacity.

Figure 7. Wind power potential
Mean wind power density (W/m^2)

Source: Map produced by The Global Wind Atlas
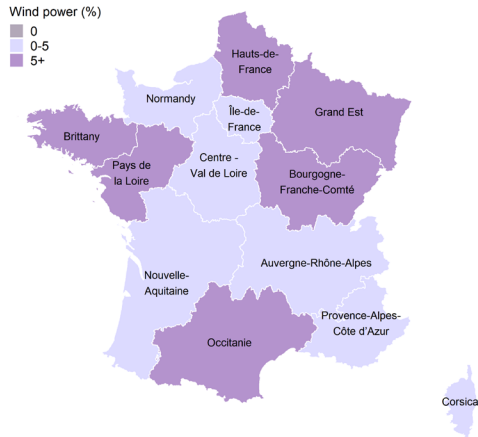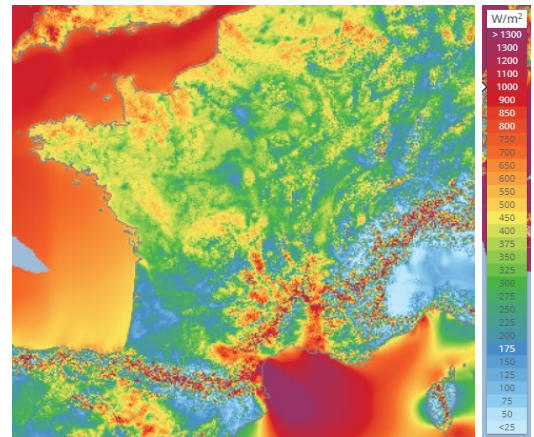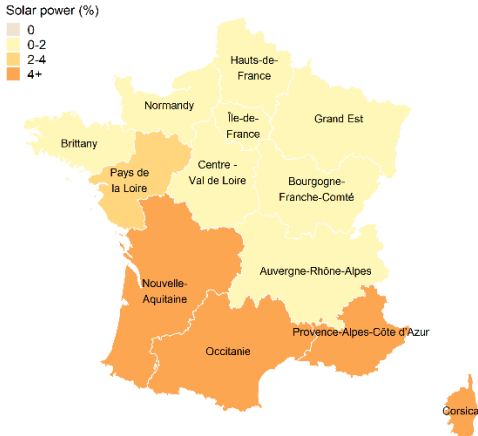
Solar power
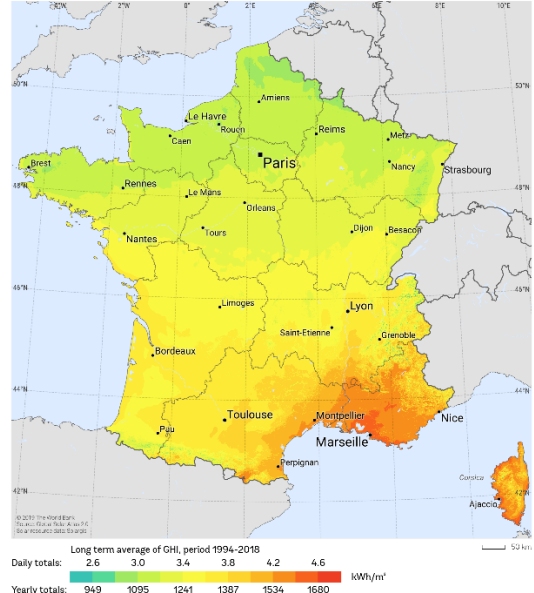
2019 OECD average: 3%	2019 French average: 2%	2030 well below 2°C benchmark for the EU: >14%

Figure 8. Regional solar power generation estimates
Per cent of total electricity generation, large regions (TL2), 2018

Figure 9. Solar power potential
Global horizontal irradiation (kWh/m^2)

Source: Map produced by The Global Solar Atlas

Although wind and solar shares are far below the 2030 benchmarks, France has one of the largest shares of zero-emission electricity generation due to nuclear power and hydropower.

Benchmark notes: The well-below 2 degrees benchmarks show IEA Sustainable Development Scenario (SDS) numbers. The SDS models how the global energy system can evolve in alignment with the Paris Agreement's objective to keep the global average temperature increase well below 2°C above pre-industrial levels. According to the Powering Past Coal Alliance (PPCA), a phase-out of unabated coal by 2030 for OECD countries is cost-effective to limit global warming to 1.5°C.

Figure notes: Figure 4 shows data from the IEA (2020). Figures 5 and 6 show OECD calculations based on the Power Plants Database from the WRI. The database captures electricity generation from the power plants connected to the national power grid. As a result, small electricity generation facilities disconnected from the national power grid might not be captured. See here for more details. Figure 8 uses data from Bilan Électrique 2018. Figures 7 and 9 show the power potential of solar and wind. Mean wind power density (WPD) is a measure of wind power available, expressed in Watt per square meter (W/m²). Global horizontal irradiation (GHI) is the sum of direct and diffuse irradiation received by a horizontal surface, measured in kilowatt hours per square metre (kWh/m²).

SECTORAL EMPLOYMENT RISKS

Figure 10. Employment in selected sectors which may be subject to employment loss by 2040 if emissions are reduced in line with the Paris climate agreement

Per cent of total regional employment, large regions (TL2), 2017
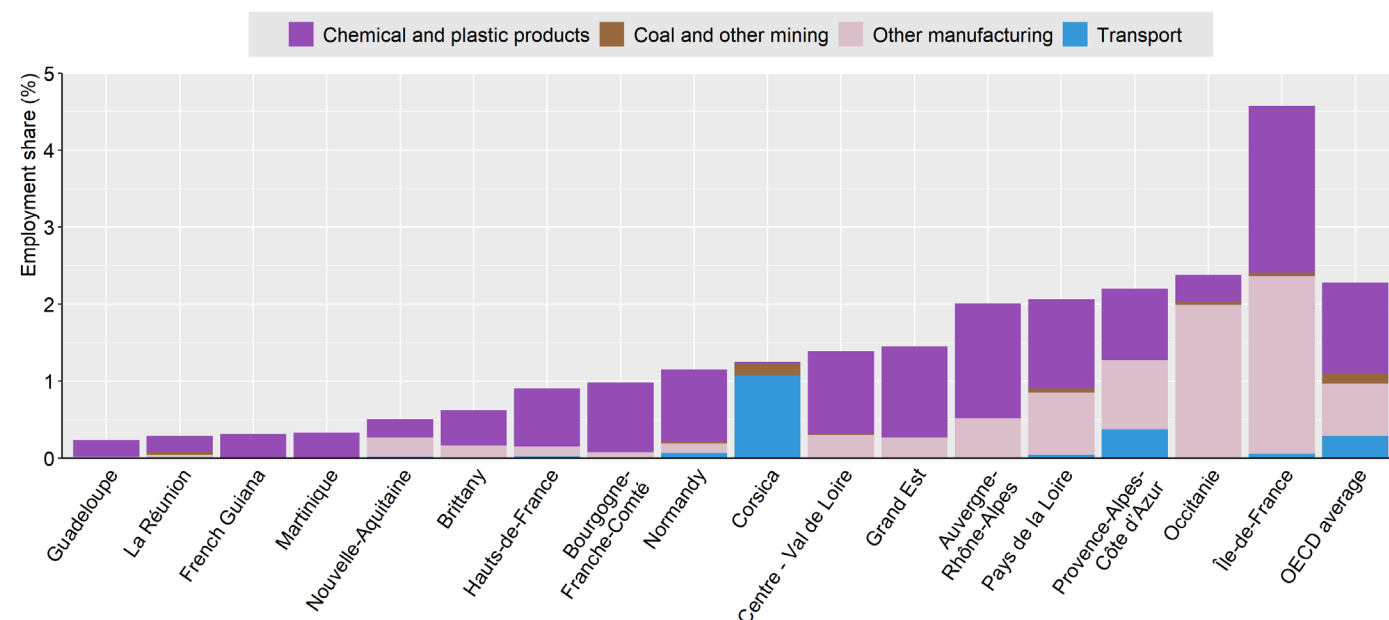
There will be both employment gains and losses due to the transition to net zero greenhouse gas emissions. They may not be distributed in the same way across regions. Employment in sectors that may be subject to some job loss by 2040 as a result of policies to reduce emissions in line with the climate objectives in the Paris Agreement amounts to less than 5% in all French regions. Most French regions have less employment in these sectors than the OECD average. Île-de-France, Occitanie and Provence-Alpes-Côte d'Azur have a larger share, largely driven by chemicals and other manufacturing (mainly in manufacture of other transport equipment). The selection of sectors is broad and based on employment effects simulated across OECD countries (See Box 3.9 of the 2021 *OECD Regional Outlook*). It does not take specific local characteristics into account.

Figure notes: Figure 10 is based on data from OECD Statistics. Sectors are selected based on macroeconomic simulations of a scenario limiting global warming to well below 2 degrees. See Box 3.9 in the 2021 *OECD Regional Outlook* for more details.

TRANSPORT

Electrification of passenger cars

| **2019 French average share of full-electric new passenger cars: 2%**	**Benchmarks for new zero-emission passenger car sales:** **IEA well-below 2°C benchmark: 100% by 2040.** **Aligned with net zero emissions by 2050: 100% by 2035 at the latest. 2030 cost-effective.**	**French target sales of zero emission new passenger cars:** **100% by 2040**

Modal shift

Paris metropolitan area has higher GDP per capita but worse public transport performance than Rennes. For comparison, London (UK) has among the highest public transport performance scores. Inhabitants of the metropolitan area of London can on average reach 95% of the population living within 8 km in 30 minutes with public transport.

Figure 11. Public transport performance in 2018
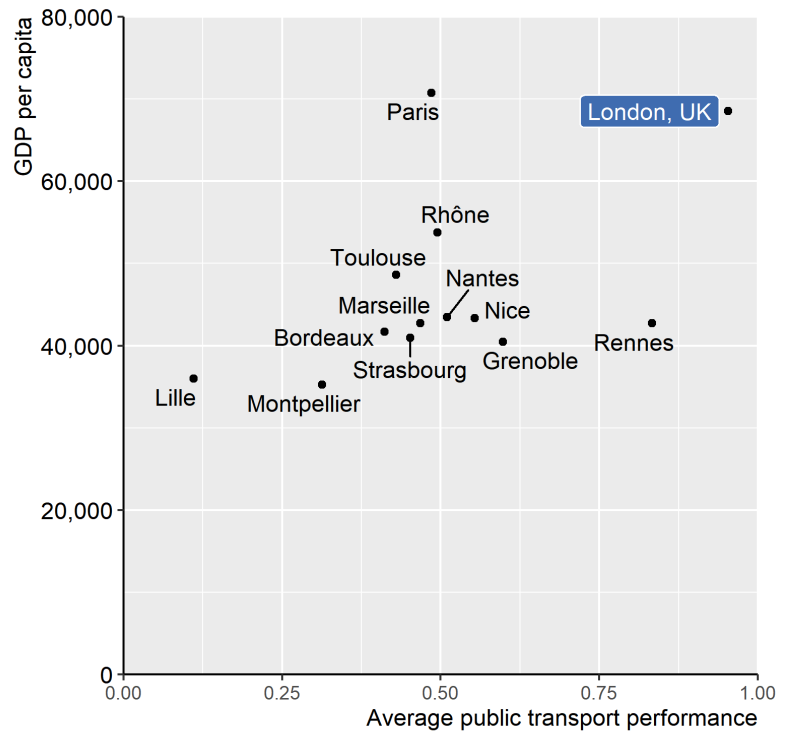
Benchmark notes: In the IEA's Sustainable Development Scenario, OECD countries (such as the European Union, Japan and the United States) as well as China fully phase out conventional car sales by 2040. This scenario is aligned with the Paris Agreement's objective to keep the global average temperature increase well below 2°C above pre-industrial levels. The UK Committee on Climate Change finds that all new cars and vans should be electric (or use a low carbon alternative such as hydrogen) by 2035 at the latest to reach net zero GHG emission targets by 2050. A more cost-effective date from the point of view of users is 2030.

Figure notes: Figure 11 is based on data from ITF and OECD Statistics. See Box 3.10 in the 2021 *OECD Regional Outlook* for more details. GDP per capita is expressed in USD per head, PPP, constant prices from 2015.
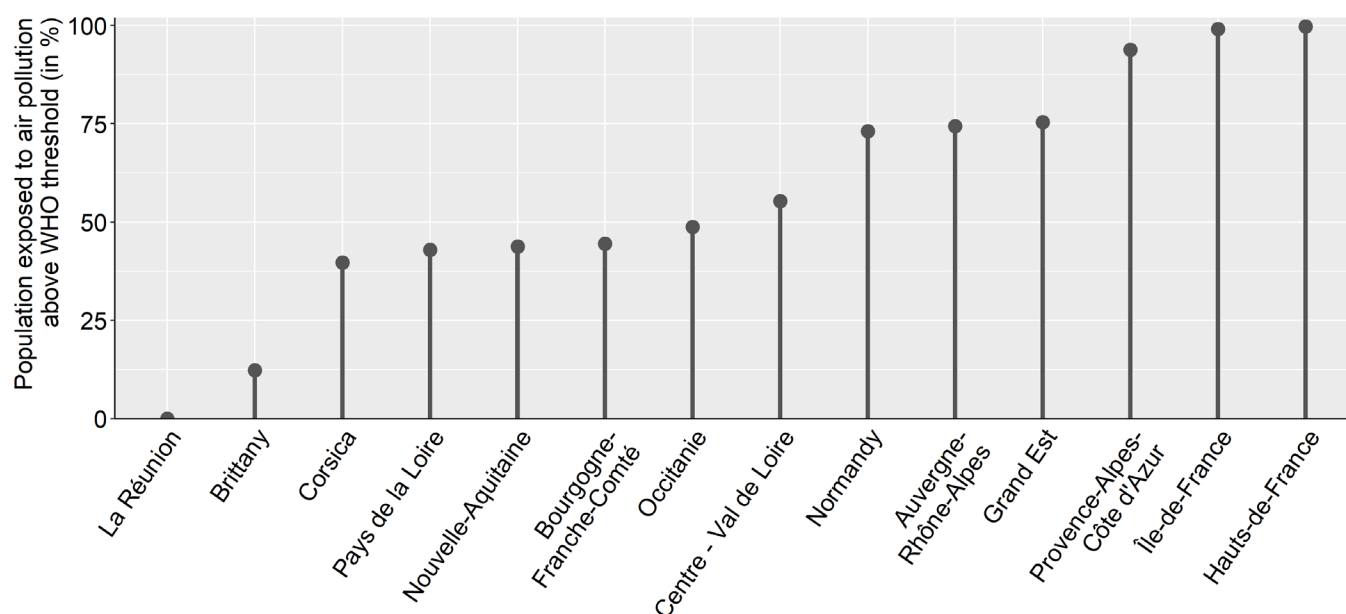
AIR POLLUTION

Large regions (TL2)

2019 OECD share of population exposed above the WHO-recommended threshold: 62%	**2019 French share of population exposed above the WHO-recommended threshold: 69%**	WHO-recommended air quality threshold: **WHO-recommended air quality threshold:** PM2.5 annual mean concentration **< 10 µg/m3**

Figure 12. Share of population exposed to levels of air pollution above the WHO-recommended threshold

Percentage of population exposed to above 10 µg/m3 PM2.5, large regions (TL2), 2019

Policies towards net-zero greenhouse gas emissions can bring many benefits beyond halting climate change. They include reduced air and noise pollution, reduced traffic congestion, healthier diets, enhanced health due to increased active mobility, health benefits through thermal insulation, and improved water, soil and biodiversity protection. Some are hard to quantify.

According to OECD data, in most regions 50% or more of the population was exposed to small particulate matter air pollution above the WHO threshold in 2019. However, OECD data can be different from those produced in France: for example, only 20% of the population in Provence-Alpes-Côtes d'Azur, 17% in Auvergne-Rhône-Alpes, and 9% in Occitanie were exposed above this threshold according to data produced in France. Small particulate matter (PM2.5) is the biggest cause of human mortality induced by air pollution. Major disease effects include stroke, cardiovascular and respiratory disease. Air pollution amplifies respiratory infectious disease such as COVID-19. It affects children the most. It reduces their educational outcomes as well as worker productivity.

Figure notes: Figure 12 is based on data from OECD Statistics. Differences between methodologies have been studied at European level by: The European Topic Centre on Air Pollution and Climate Change Mitigation (2018) *Long-term air quality trends in Europe. Fine Particulate Matter (PM2.5) Health Impacts. ETC/ACM Technical Paper 2017/4 April 2018.*