

# Summary

## About this report

### The Secten format

This report presents an update of air pollutant and greenhouse gas emissions for metropolitan France using the "Secten" format defined by Citepa and aimed at reporting emissions according to a breakdown corresponding to traditional economic entities such as energy, industry, waste, residential/commercial, agriculture, transport and LULUCF. (see Annex 3 for the definition of these sectors and sub-sectors).

Unless otherwise stated, the results cover the period 1990 - 2018 (estimates for 2018 being preliminary), but sometimes go back further in time: to 1980 for some substances, in particular those covered by the various Protocols to the Convention on Long-Range Transboundary Air Pollution and to 1960 for substances traditionally estimated by Citepa (SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, CO).

In total, data are reported for **31 different substances** and various indicators including those related to acidification and the greenhouse effect.

### France's emission inventory and Citepa's role

Citepa officially estimates greenhouse gas and air pollutant emissions each year on behalf of the Ministry of the Environment. With each reissue of this inventory, all years are recalculated as data and methods evolve and are refined. This inventory is first carried out as part of France's international commitments, mainly under the United Nations Framework Convention on Climate Change (and the Kyoto Protocol and the Paris Agreement resulting from it) for greenhouse gases, and the United Nations Economic Commission for Europe for pollutants (LRTAP Convention). There are different emission results available depending on the sectoral breakdown and the geographical scope chosen. This Secten report concerns emissions in **metropolitan France**.

☞ To understand the principles of the inventory, see the *Comprendre nos données d'émission* chapter.

☞ For a definition of acronyms, see the Glossary in the Appendix.

## Key results: greenhouse gas emissions

### Greenhouse gas emissions are down from 1990 to 2017

Greenhouse gas emissions expressed in CO<sub>2</sub>e equivalent, excluding LULUCF (land sector including the carbon sink generated by forests), have fallen by -17% since 1990: they have fallen in metropolitan France from 542 MtCO<sub>2</sub>e in 1990 to 452 MtCO<sub>2</sub>e in 2017. In the "Kyoto" perimeter (metropolitan France and overseas France included in the EU), these emissions fell from 548 MtCO<sub>2</sub>e in 1990 to 465 MtCO<sub>2</sub>e in 2017, a decrease of -15%.

### The sectors that contributed most to this decline

The sectors with the largest decreases between 1990 and 2017 (Kyoto perimeter) are energy transformation (-36%), (-74% for the extraction and distribution of liquid fuels, -99.8% for the extraction and distribution of solid fuels) and manufacturing industry (-44%) with notably -67% for non-ferrous metals metallurgy, -60% for the chemical industry.

### Sectors where emissions have risen since 1990

In the Transport sector, there was a 11% increase in emissions between 1990 and 2017. In particular, emissions from passenger cars, which account for more than half of CO<sub>2</sub>e emissions from the transport sector, increased by 6% between 1990 and 2017 (-65% for petrol cars, +241% for diesel cars).

Lastly, while emissions of all substances monitored and assessed in the inventory are down between 1990 and 2017, there has been a sharp increase in HFC emissions. This is because HFCs were almost unused in 1990: they replaced CFCs and HCFCs, which were in turn progressively banned from use under the Montreal Protocol. HFC emissions in 1990 were almost entirely due to the production and use of HCFCs (HFC-143a component of HCFC-408A and HFC-23 by-product of HCFC-22) and were very low. Considering the base year 2005 defined for fluorinated gases by the European Commission in its Roadmap for moving to a competitive low carbon economy in 2050 on which Regulation (EU) No. 517/2014 is based, the increase in HFC emissions from 2005 to 2017 is 38%.

### Greenhouse gas emissions slightly increased from 2014 to 2017

Between 2014 and 2017, greenhouse gas emissions (excluding LULUCF) ceased to follow a downward trajectory (observed over the 1990-2013 period) and annual increases ranging from 0.2% to 0.9% were recorded (+0.9% between 2016 and 2017, +0.2% between 2015 and 2016, +1.1% between 2014 and 2015...). These increases remain low in comparison to the year-on-year increases observed in the 1990s (+4.9% between 1990 and 1991, +3.2% between 1995 and 1996, +2.5% between 1997 and 1998). Furthermore, the provisional estimates for 2018 show a sharp fall in emissions.

### Preliminary estimate for 2018: emissions are expected to fall again (-4.2%)

*Warning: the year 2018 is estimated provisionally, with a much lower level of finesse than the years 1990-2017. 2018 is provided for information purposes only, and estimated via proxy indicators.*

Between 2017 and 2018, emissions in the "Kyoto" perimeter (metropolitan France and overseas included in the EU) fell from 465 MtCO<sub>2</sub>e in 2017 to 445 MtCO<sub>2</sub>e in 2018, a decrease of -4.2%. This estimation (which remains to be confirmed in our inventory results to be published next year) is not new. Other significant year-on-year declines have been observed since 1990, within the same scope, in particular between 2013 and 2014 (-6,3%), and between 2010 and 2011 (-5.1%). This change is mainly due to the following explanatory factors:

- for electricity generation, a milder winter in 2018 than in 2017 - and nuclear power plant unit shutdowns in 2017,
- for residential-commercial emissions, a decrease in heating-related emissions as a result of the milder winter in 2018 than in 2017 ; for road transport, the change is due to a reduction in diesel deliveries,
- in 2017, emissions were higher due to nuclear power plant unit temporary shutdowns leading to fossil energy production to compensate for the loss of power.

### Are greenhouse gas emission reduction targets being met?

The National Low Carbon Strategy (SNBC) defines a path to reduce GHG emissions consistent with the Paris Agreement, i.e. by limiting the rise in global average temperatures to 2°C by achieving carbon neutrality (balance between emissions and removals) from 2050. The first carbon budget defined by the SNBC (see chapter Politique et Réglementation) for the period 2015-2018 was not complied with. Indeed, the threshold of 440 Mt CO<sub>2</sub>e/year (Kyoto perimeter) was exceeded by 4.9% on average over 2015-2017 (with 462 Mt CO<sub>2</sub>e/year on average). However, if the sharp decline estimated in 2018 is confirmed and continues, it would enable France to follow a trajectory consistent with this target and meet the next carbon budget (421 Mt CO<sub>2</sub>e/year from 2019 to 2023).

## Key results: air pollutant emissions

### Despite recurring air quality problems, pollutant emissions are decreasing

In particular for NO<sub>2</sub>, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and ozone, air quality remains a problem in France, especially in large urban areas and when weather conditions prevent the dispersion of pollutants. Thus, pollution episodes regularly occur in summer (ozone) and in spring (particulate matter). In addition, in particular because of non-compliance with the concentration limit values for PM<sub>10</sub> and NO<sub>2</sub>, the European Commission has launched infringement procedures against France.

However, emissions of all pollutants declined between 1990 and 2017. In particular, emissions of ozone precursors decreased significantly between 1990 and 2017: -59% for NO<sub>x</sub> (including NO<sub>2</sub>), -75% for NMVOCs, -74% for CO and -20% for CH<sub>4</sub>. Emissions of PM<sub>10</sub> and PM<sub>2.5</sub> also decreased by 54% and 62% respectively over the same period.

*Warning : Citepa estimates emissions (total estimated quantities, both nationally and annually) and not concentrations (measured quantities per unit of air, local, over a limited period of time). Air quality depends not only on emissions, but also on other parameters, particularly meteorological ones: transport and dispersion by wind and rain, deposition or chemical reactions of pollutants between them (formation of secondary particles in particular) or under the action of sunlight, topography, resuspension of particles already emitted, etc. For information on air quality, refer to the information provided by the regional AASQAs (Approved Associations for Air Quality Monitoring).*

### Some pollutants have been virtually eliminated

Emissions of some pollutants have been virtually eliminated: HCB (emissions from the aluminium industry having ceased in 1994), lead (notably with the ban on leaded fuels in 2000), chromium, dioxins and furans (PCDD/F).

### Declines that do not always continue

Emissions of SO<sub>2</sub>, NO<sub>x</sub>, NMVOCs, nickel, mercury and black carbon have decreased significantly (around 60% to 80%) and have continue to decrease in recent years.

On the other hand, emissions of other pollutants have stagnated for several years after a sharp decrease, in particular particulate matter (TSP, PM<sub>10</sub> and PM<sub>2.5</sub>), PAHs and PCBs as well as some heavy metals (zinc, cadmium, arsenic).

Finally, emissions of three pollutants fell slightly between 1990 and 2016 (NH<sub>3</sub>, Cu, Se). NH<sub>3</sub> emissions, stable since 2006, are mainly related to the management of livestock manure (decreasing emissions due to the decrease in cattle numbers) and to the fertilization of cultivated land. Copper emissions from industry have fallen sharply, but not from road transport (brake pad wear) and especially from rail (catenary wear). Selenium emissions, which declined slightly, were mainly due to glass production.

### Are pollutant emission reduction targets being met?

To date, **France has met its air pollutant emission reduction targets** set under various Protocols and Conventions, aimed at: SO<sub>x</sub>, VOCs, PAHs, HCBs, cadmium (Cd), mercury (Hg), lead (Pb)... **except for the targets for NO<sub>x</sub> emissions**. In fact, the Sofia Protocol target (30% reduction in NO<sub>x</sub> emissions between 1980 and 1998) was not achieved in 1998, but in 2006; the Gothenburg Protocol target (not to exceed the 860 kt annual NO<sub>x</sub> emission ceiling in 2010) was not achieved in 2010 but in 2012 with the adjustment procedure; the NEC Directive's target (not to exceed the 810 kt annual NO<sub>x</sub> emission ceiling in 2010) was not achieved in 2010 but in 2013 with the adjustment procedure. For the latter two cases, the adjustment procedure allows the calculated emissions to be compared with the same method as that used when the ceilings were set.

This report presents the emission trajectories substance by substance, with regard to the different past and future objectives.

## Download data, inventory reports and methodology report

The data in Excel format can also be downloaded from the Citepa website at the following address:

<https://www.citepa.org/en/activities/emission-inventories/secten>

The "Ominea" methodological report can also be downloaded from our website. It describes in detail the source data, emission factors, calculation principles used to estimate the emissions of each emitting sector.

<https://www.citepa.org/fr/activites/inventaires-des-emissions/ominea>

The other inventory reports are also available on our website:

<https://www.citepa.org/en/activities/emission-inventories>