PART I

Chapter 1

Environmental performance: Trends and recent developments

This chapter provides an overview of the main environmental trends observed in France since 2000. It describes the progress made and the challenges that France needs to overcome if it wants to continue decoupling environmental pressures from economic growth. It reviews the main economic and social developments, takes stock of changes in economic energy, carbon and material intensities, and measures the steps taken towards the sustainable management of natural resources, including water resources and ecosystems.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

1. Introduction

France is the largest country in the European Union by area and the fifth largest economy in the OECD. Its people enjoy relatively high levels of education and quality of life. Although it has withstood the global economic crisis fairly well, growth has been weak since, and the unemployment rate is high. Thanks to its geographic position within Europe and its overseas possessions, France embraces a great diversity of land-based and marine ecosystems. In contrast, it has little in the way of fossil fuel or mineral deposits, and its freshwater resources are modest.

This chapter provides a snapshot of key environmental trends in France and highlights the main outcomes as well as the important challenges that will have to be addressed with a view to achieving green growth and sustainable development. It relies on indicators derived from national and international sources to evaluate the country's progress since 2000 in pursuit of its national and international objectives. Wherever possible, the state of the environment and the main environmental changes are compared with those in other OECD Member countries. In this way, the chapter establishes a frame of reference for the following chapters, which assess the extent to which French environmental policies have succeeded in influencing trends and using environmental objectives to create economic and social opportunities.

2. Main economic and social developments

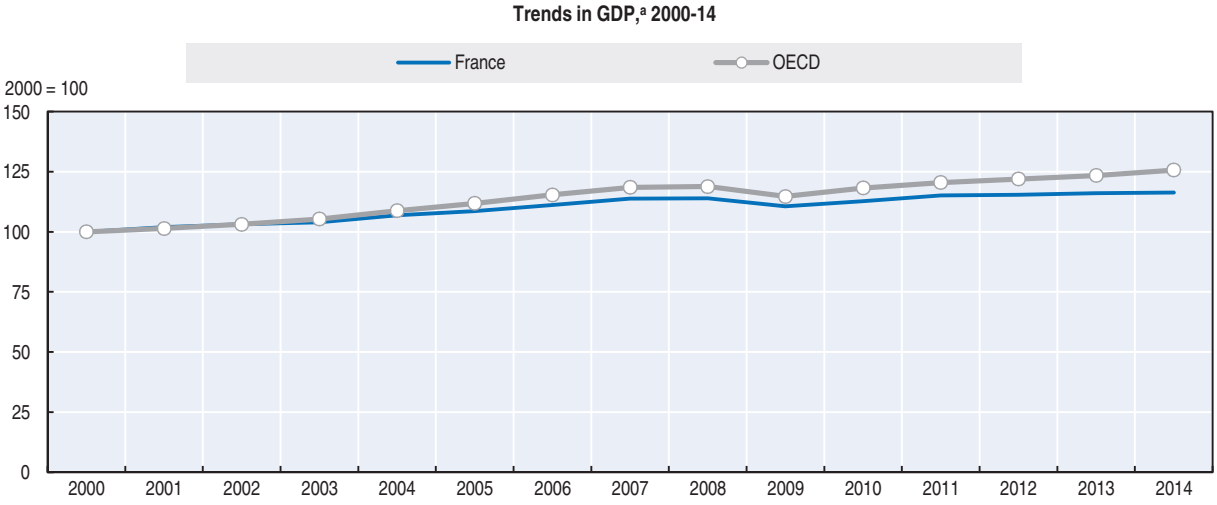
2.1. Economic performance is weaker than the OECD average

Per capita GDP in France is equal to the average for OECD member countries. Labour productivity is high, thanks to a relatively skilled workforce. The government's cost of borrowing remains low. The banking system is sound and, in contrast to some other countries in the euro zone, the supply of credit does not seem to be constraining economic activity, even for small and medium-sized enterprises (OECD, 2015a).

Over the period 2000-14, French economic growth has been weaker than the average for OECD member countries (Figure 1.1). While GDP for the OECD as a whole rose 26% by volume and 14% on a per capita basis, in France GDP increased by only 16% and 7%, respectively. This gap has widened in recent years. French GDP was up by 14% between 2000 and 2008, then fell by 3% in 2009 due to the economic crisis. After a slight rebound in 2010 and 2011, GDP has stagnated since 2012, with an annual growth rate of less than 1%. This can be blamed, among other things, on insufficient domestic demand, a steady decline in French export performance since 2002, as well as recurrent deficits on the current account balance and low investment by businesses. Forecasts point to a slight recovery for 2015 and 2016, with a GDP growth rate close to 1.1% and 1.5% respectively (OECD, 2015b).

French businesses are experiencing competitiveness problems. Exports of goods and services represented 28% of GDP in 2014, a ratio that has remained stable since 2000. In contrast, the weight of French trade and exports vis-à-vis the rest of the world declined steadily over the same period. Lack of competition in certain sectors leads to high prices

Figure 1.1. **Economic growth is below the OECD average**



a) GDP at 2010 prices and purchasing power parities.
Source: OECD (2015), *OECD National Accounts Statistics* (database).

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and high costs, which depress productivity and purchasing power and hence economic performance. France is in thrall to heavy rules and regulations, cumbersome administrative and business procedures, and a complex taxation system that impedes business creation (OECD, 2015a).

In an effort to boost economic growth, the government undertook significant structural reforms in 2012 which, if they are applied, could have a major impact on the economy. The reforms already under way involve reducing regulatory constraints on competition, improving the labour market and tax structure, and simplifying the country's territorial organisation. The reforms announced, although not yet implemented, call for the reduction of regulatory barriers to competition in the network industries (gas and electricity) and in regulated professions. The overall impact of these measures is expected to boost GDP by 1.6% over the next five years, and by 3.7% in 10 years (OECD, 2015a).

The weight of public spending is higher than in the majority of OECD member countries. Since 2000, such spending has risen from 51% to more than 57% of GDP. This can be laid to the fact that in France public employment, social benefits, health spending and retirement pensions are higher than in most European countries. (Insee, 2015) (OECD, 2015a).

Fiscal pressure has increased sharply since 2009, and exceeded 45% of GDP in 2014, placing France in second position among OECD member countries in terms of the rate of compulsory contributions (chapter 3). On the other hand, environmentally related tax revenues shrank over the period 2000-14, both as a share of GDP and as a proportion of total tax revenues. In 2014, they represented 2.0% of GDP and 4.4% of tax revenues, ratios that are among the lowest in OECD Europe (Chapter 3).

2.2. A services-based economy characterised by high unemployment and sharp regional disparities

France is one of the most highly tertiarised economies in the OECD, despite its relatively diversified industrial structure. In 2014, the services sector accounted for 79% of value added

(versus 74% in 2000), followed by the industrial sector (including construction), which contributes 19% of GDP, and agriculture, at 2%. The construction sector has been particularly hard hit by the economic crisis. While it saw strong growth in its value added until 2007 (+15% over 2000), that growth then dropped to 19% between 2007 and 2014 (OECD, 2015c).

In 2013, the tertiary sector represented 76% of employment, while the equivalent figure for industry was 20% (including 7% for construction) and 3% for agriculture. Public administration, education and health alone account for around 30% of employment, followed by retail and wholesale trade, at 12% (Insee, 2015).

France is also characterised by a high unemployment rate, attributable for the most part to rigidities in the labour market. Unemployment has been rising steadily since the 2008 crisis: in 2013 it exceeded 10%, and now stands well above the OECD average of 7%. Young people under the age of 25 are particularly affected, with an unemployment rate that stood at 24% in 2013, compared to the OECD average of 16% (OECD, 2015b).

Some 80% of the population is concentrated in major urban areas, which occupy a third of the territory. Apart from the megalopolis of Île-de-France, which surrounds the capital, urban zones are concentrated along the country's borders and its coastline. Île-de-France generates around 30% of French GDP and is home to 20% of the economically active population. The North and East regions of France, where mining, steel making and textile industries are located, have been particularly affected by the decline in the industrial sector, and they have high unemployment rates. On the other hand, the high unemployment rate of the Mediterranean basin is explained by its surplus balance of migration. The drop in agricultural employment has been felt particularly in the West and Southwest regions. The Southeast (Rhône-Alpes and Provence-Alpes-Côte d'Azur) is the second most dynamic economic centre of France, accounting for 17% of the active population and 18% of the country's GDP (OECD, 2015d, 2015e, SOeS, 2014).

2.3. The standard of living is relatively high

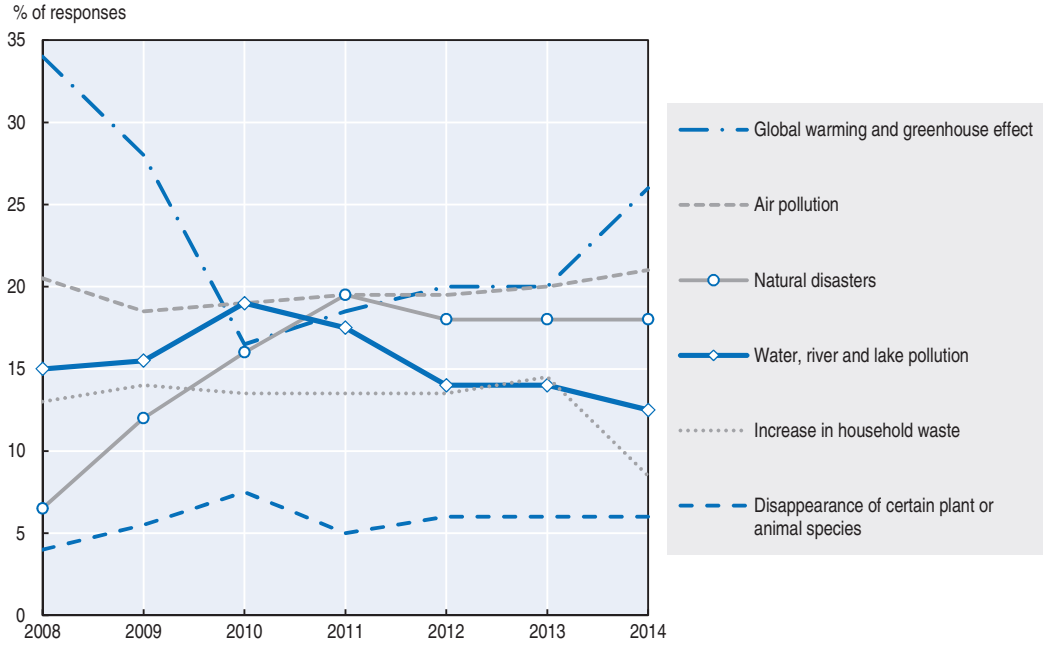
France has relatively high levels of well-being and quality of life. It ranks above the majority of OECD member countries in terms of income and wealth, balance between working and private life, and health and social relationships. Life expectancy at birth is high, at 85 years for women and 79 years for men, compared to an average life expectancy in OECD member countries of 82 and 77 years respectively. The fertility rate is among the highest in the OECD, with an average of two children per woman, whereas the OECD average is 1.7. France also has a relatively well-educated workforce, although the proportion of the population with a senior secondary school diploma or higher (73%) is below the OECD average (75%) (OECD, 2015f).

Compared to countries with equivalent living standards, the state of health is good overall in France, with respect to the major indicators such as standardised mortality or life expectancy (at birth or at 65 years), and other thematic indicators such as cardiovascular mortality, the second-ranking cause of death in France. Life expectancy continues to rise, contributing to the ageing of the population and an increase in the number of persons afflicted by chronic illnesses and functional disabilities. Important disparities persist, however, between men and women and between regions and social categories (Drees, 2015).

While the economic crisis may have shunted the environment to second rank[1] among the French people's concerns, the subject remains a source of concern. Climate change and air pollution are the environmental problems that most preoccupy the French. This

tendency can be explained by the growing communication on these subjects and by repeated surges of pollution in recent years. Natural disasters rank third among public concerns, as a result of recent floods and storms. By contrast, the increase in waste attracts less interest than in the past. The survey also shows that the French do not seem to place great importance on the loss of biodiversity (CGDD, 2015) (Figure 1.2).

Figure 1.2. **Climate change and air pollution are the primary environmental concerns among the French**



Source: CGDD (2015), *Opinions et pratiques environnementales des Français en 2014*, Chiffres et statistiques.

3. Transition to an energy-efficient and low-carbon economy

3.1. *Energy use*

A low-carbon energy mix

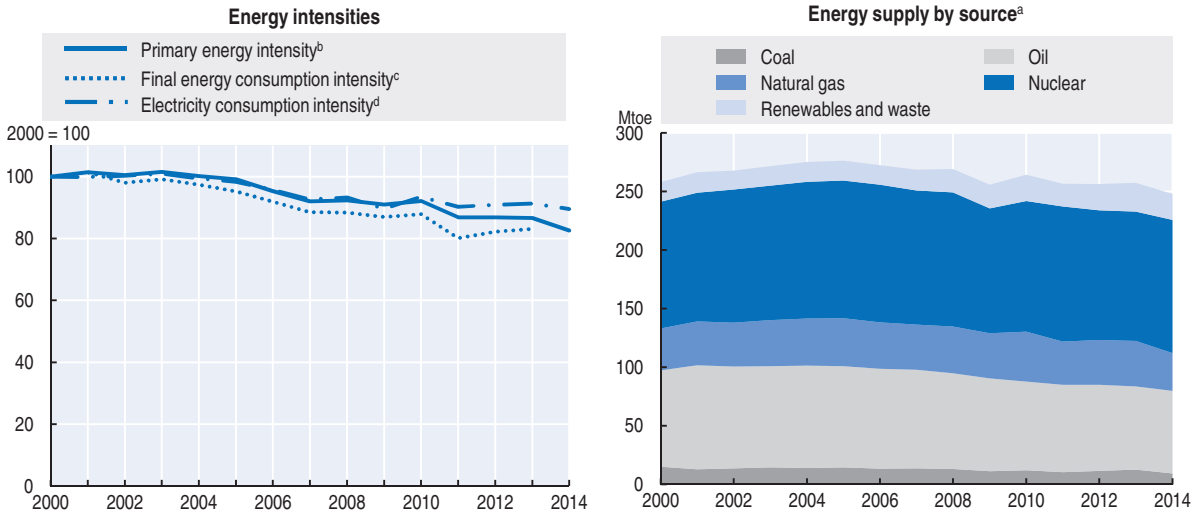
The energy mix is dominated by nuclear power, which in 2014 accounted for 47% of total primary energy supply (TPES) and 78% of electricity generation (Figure 1.3). Since 2000, the share of fossil fuels in TPES has shrunk in favour of nuclear and renewables. This translates into an energy mix that is less carbon-intensive than the OECD average. Following the Fukushima incidents in 2011, the French government committed itself to reducing the nuclear share in power generation to 50% by the year 2025 (Chapter 4).

Although their share has risen since 2000 overall, renewables accounted for only 47% of total primary energy supply in 2014, and 78% of electricity generation (Figure 1.3). Similarly, 16% of French electricity generation was of renewable origin, compared to 22% for the OECD average and 31% for European countries (AIE, 2015).

Energy intensity

The French economy is less energy-intensive than the OECD average. After rising by 8% in the years 2000-05, TPES declined by more than 10% between 2005 and 2014 (Figure 1.3).

Figure 1.3. **Nuclear is predominant in the energy mix**



a) Total primary energy supply. Breakdown excludes trade of electricity.
b) Total primary energy supply per unit of GDP (2010 prices and PPPs).
c) Final energy consumption per unit of GDP (2010 prices and PPPs).
d) Electricity consumption per unit of GDP (2010 prices and PPPs).
Source: IEA (2015), *IEA World Energy Statistics and Balances* (database); OECD (2015), *OECD National Account Statistics* (database).

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Over that period as a whole, GDP rose by 16%, with the result that the economy's primary energy intensity dropped by 17%. This progress is however less significant than the average of OECD member countries.

The decline in final energy consumption, which began in 2005, was accentuated by the 2008 crisis, despite some fluctuations (Figure 1.4). Whereas energy demand in the residential, trade and agriculture sectors increased between 2000 and 2013, it fell sharply (by 18%) in the industrial sector and declined more modestly in the transport sector (by 4%).

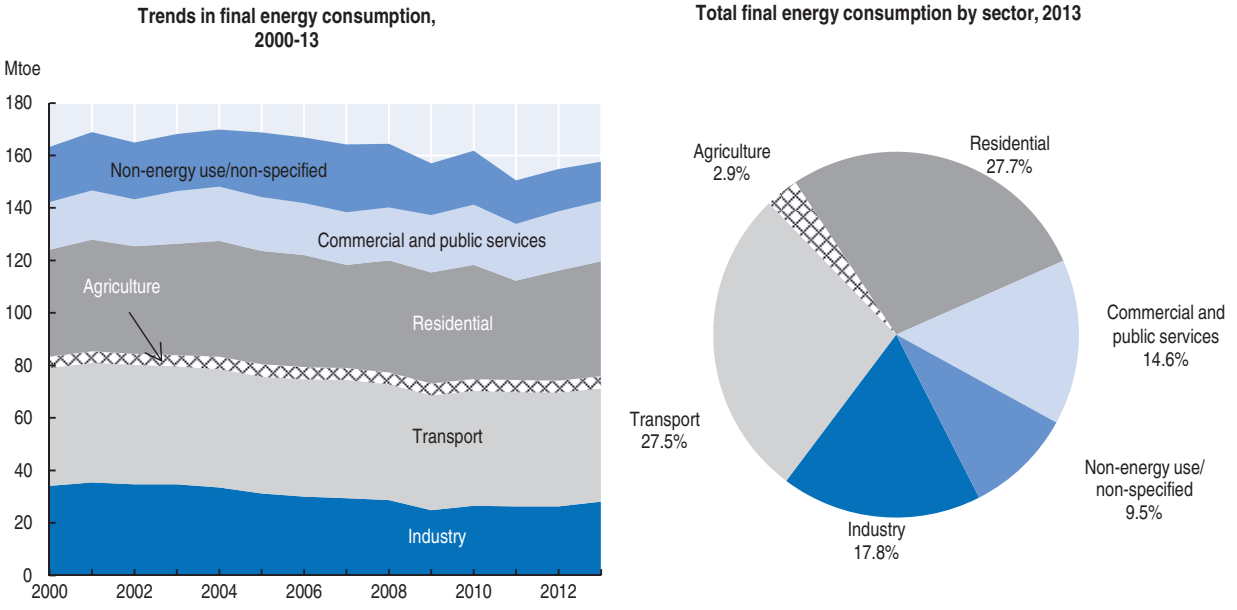
France has exceeded the intermediate objective for energy savings set for 2010 in the First National Plan for Energy Efficiency, established in 2008[2] (Medde, 2014a). In the context of the EU Energy Efficiency Directive (2012/27/EU[3]), France has set a goal of reducing its energy consumption to 131 Mtep of final energy and 236 Mtep of primary energy by 2020. Between 2005 and 2012, primary energy consumption declined more swiftly than projected by the scenario established for achieving the 2020 target. The improvement in energy efficiency in the processing industries and the reduction in losses from distribution systems could yield further gains. On the other hand, final energy consumption has been falling more slowly than expected. While there has been progress in all sectors, further efforts will be needed in transportation and the residential sector (EEA, 2014).

Renewable energies

Although the supply of energy from renewable sources has risen by 33% since 2000, it still represented only 9% of TPES in 2014. More than 60% of the renewable energy supply comes from biomass (primarily solid biomass for heat production) and renewable wastes, followed by hydropower (25%) and wind and solar energy (10%) (EEA, 2015).

France has set itself a target of 23% for the share of renewables in gross final energy consumption by the year 2020, pursuant to the applicable European directive (2009/28/EC).

Figure 1.4. **Energy consumption is dropping in industry and rising in the residential-tertiary sector**



Source: IEA (2015), *IEA World Energy Statistics and Balances* (database).

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Solid biomass and wind power are the two main sources identified by the National Action Plan for Renewable Energies (Chapter 4). In 2014, renewables represented 14.6% of gross final consumption, short of the intermediate target set at 16% (Figure 1.5). This lag relates to both electrical and thermal components (Medde, 2015a).

While the objective set for solar power has been practically achieved, if the target of 23% is to be met the efforts made since 2005 will have to be nearly tripled in the case of renewable electricity and nearly quadrupled in the case of renewable heat between 2014 and 2020.

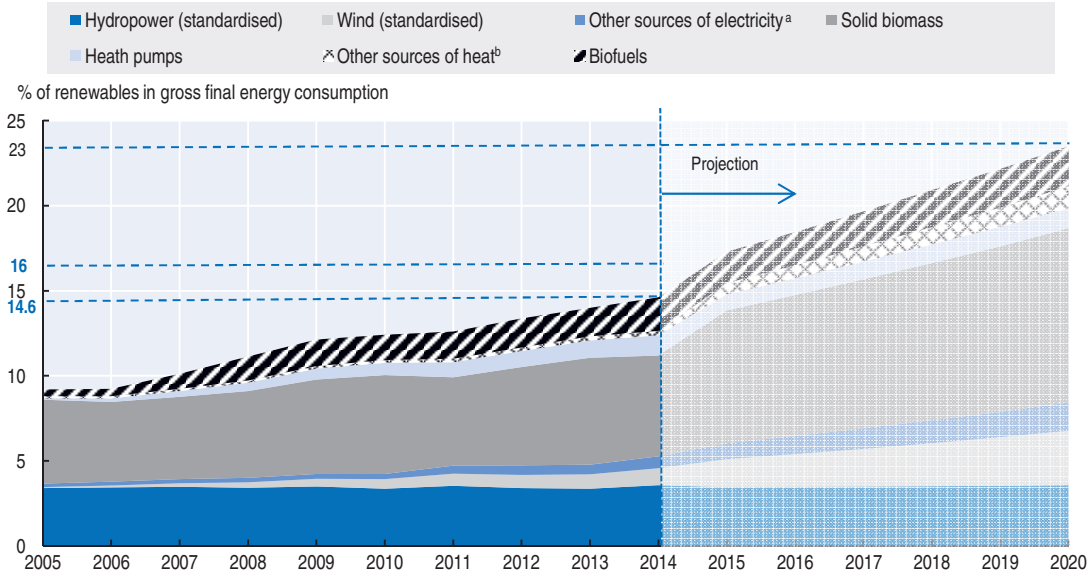
3.2. Road transport predominates

The transport sector is the second biggest consumer of energy (28% of final consumption in 2013) and produces the most greenhouse gas emissions (27% of total emissions) (Figure 1.7). As in most countries, road transportation accounts for nearly all of the energy consumed by the transport sector (94%).

Since 2000, energy consumption in transportation has slowed. Apart from the decline in road freight haulage following the crisis, this slowdown can be explained by the fact that the growth of the automobile fleet has been largely offset by lower average vehicle mileage and by lower unit consumption (thanks to the switch to diesel and improved energy efficiency of engines) (Medde, 2014a).

The Grenelle Forum (Chapter 2) goal of boosting the non-road and non-air modal share from 14% to 25% by 2022 seems out of reach (Figure 1.6). Road haulage is still the principal mode of freight transport: its share went up from 81% in 2000 to 88% in 2014, at the expense of rail transport, which represented only 10% in 2014.

Figure 1.5. **The 23% target for renewables will be hard to achieve**



a) Solar photovoltaics, marine energy, geothermal electricity, biomass electricity (fuel wood, biogas, incinerated waste, bagasse).
b) Thermal solar power, geothermal power, biogas.
Source: SOeS, B*ilan de l'énergie* (achieved, up to 2014) and *national action plan* (projection, as of 2014).

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Passenger transportation is still dominated by private vehicles, which carried 83% of travellers in 2014. Collective transportation has been rising steadily (+26% for trains and +29% for busses and tramway), but the share of these two modes (10% and 5% respectively) remains far behind that of automobiles (Figure 1.6).

With 51 vehicles per 100 inhabitants in 2014, France has one of the highest vehicle ownership rates among European members of the OECD (45) (Annex 1.A). In 2012, moreover, 33% of private vehicles had been on the road for more than 10 years, and 34% for between five and 10 years, both figures up slightly from 2000. This increase has come at the expense of newer vehicles (less than two years), which represented only 13% of the fleet, versus 16% in 2000 (Eurostat, 2015a).

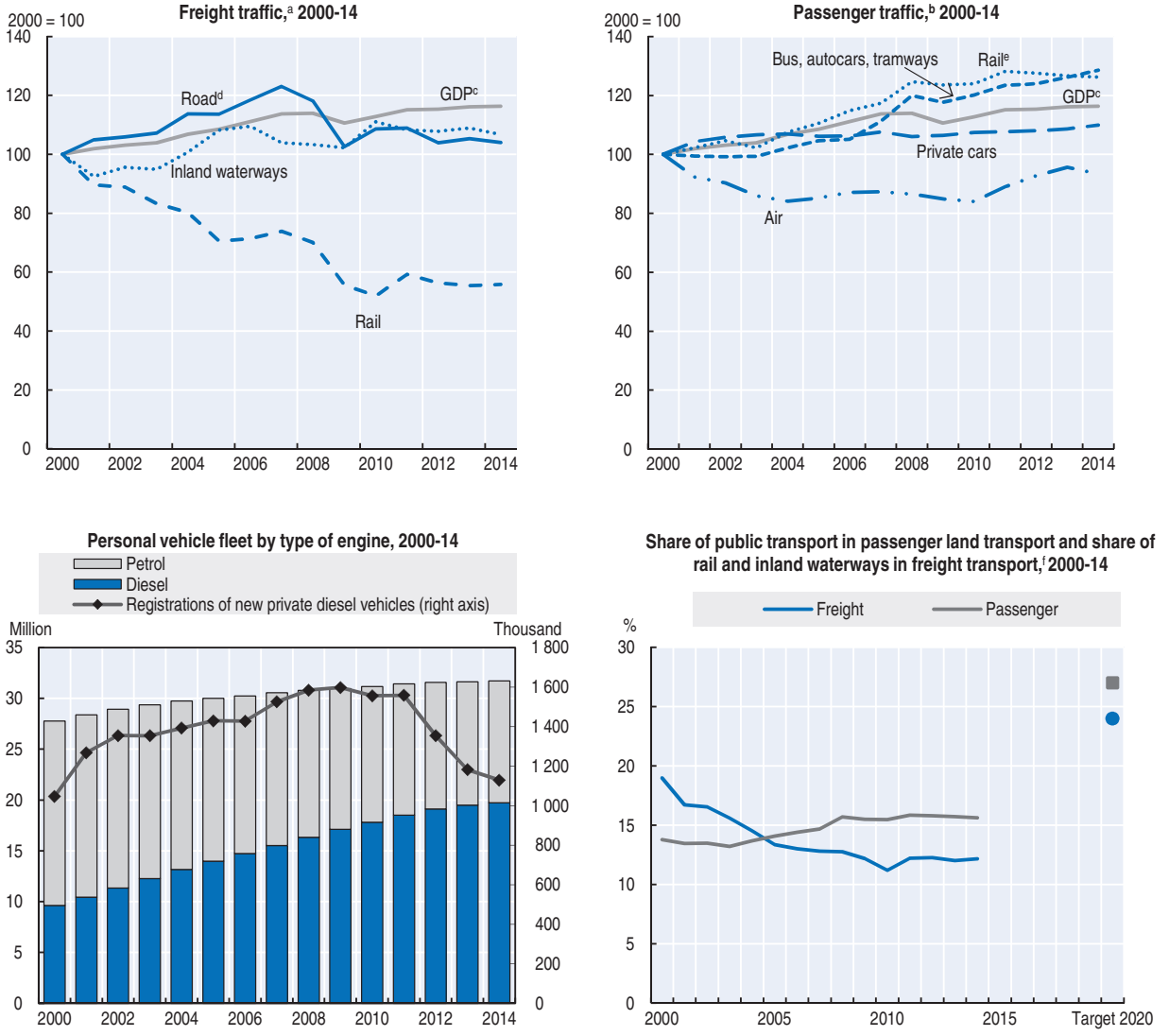
The proportion of diesel-powered automobiles has increased spectacularly, jumping from 35% in 2000 to 62% in 2014, one of the highest rates in Europe. This is due in part to relatively low taxes on diesel as compared to petrol, as well as to the preferential tax treatment of diesel-powered vehicles (chapter 3). Since 2010, however, there has been a decline in the registrations of new diesel vehicles, reflecting the elimination of the vehicle scrappage scheme and a tightening of the bonus-malus insurance scale (Figure 1.6).

3.3. Greenhouse gas emissions

Profile of emissions

Greenhouse gas (GHG) emissions in France other than those due to land use, land-use change and forestry (LULUCF), declined by 10% between 1990 and 2013. France has thus surpassed the objective that it had set, in the context of the Kyoto Protocol, of limiting its GHG emissions over the period 2008-12 to their 1990 levels. Since 2000, the decoupling of GHG and CO_2 emissions from economic growth has continued (Figure 1.7).

Figure 1.6. **Road transport and diesel fuel still predominate**



a) Based on values expressed in tonne-kilometre.
b) Based on values expressed in passenger-kilometre.
c) GDP at 2010 prices and PPPs.
d) Includes foreign vehicles. As of 2006, excludes transit but includes tonne-kilometres travelled within the national territory by national vehicles for international transport.
e) Metro included.
f) Data refer to inland transport.
Source: SOeS (2015), *Comptes des transports en 2014;* OECD (2015), *OECD National Accounts Statistics* (database).

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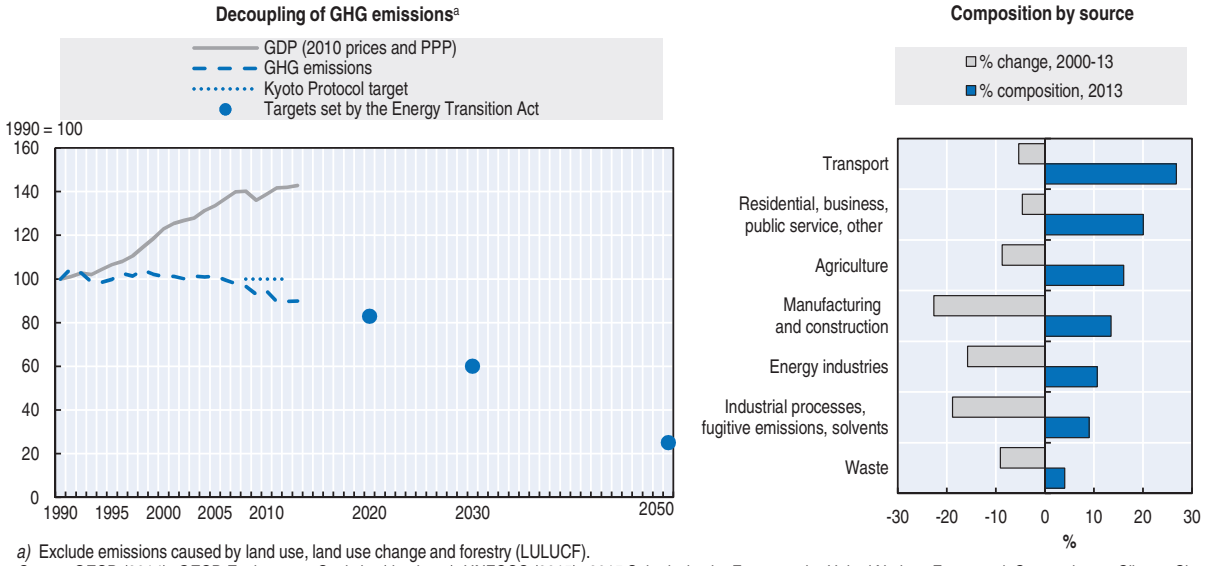
As in most OECD countries, CO_2 emissions constitute the bulk of GHG emissions in France, accounting for 75% of total emissions in 2013; they are followed by methane (CH4) and nitrous oxide (N_2O), representing respectively 12% and 9% of the total, with the remainder coming from emissions of fluoride gases (HFC, PFC, SF_6). 72% of emissions are due to energy use, particularly in transportation and in the residential and tertiary sector, which account respectively for 27% and 20% of total GHG emissions apart from LULUCF. The other main contributors are agriculture (16%), manufacturing and construction (13%) and the energy industry (11%) (Figure 1.7).

Figure 1.7. **GHG emissions are falling**



a) Exclude emissions caused by land use, land use change and forestry (LULUCF).
Source: OECD (2014), *OECD Environment Statistics* (database); UNFCCC (2015), *2015 Submission by France to the United Nations Framework Convention on Climate Change*; UNFCCC (2014), *France's first biennial report to the United Nations Framework Convention on Climate change*; OECD (2015), *OECD National Accounts Statistics* (database).

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The manufacturing and construction industry has seen the sharpest drop in emissions (-23%) since 2000. This progress, attributable to greater energy efficiency in industrial processes as well as the replacement of oil and coal by less polluting energy sources, has been accelerated by the economic crisis (SOeS, 2014). Emissions linked to energy use in transportation dropped by 5% between 2000 and 2013, especially after the 2008 crisis. The introduction of lower-carbon vehicles has served to limit emissions from transportation, despite a slight increase in road traffic.

Under the European climate and energy package, France is committed to a 21% reduction in emissions covered by the European Union Emission Trading Scheme (EU ETS) between 2005 and 2020, and a 14% cut for those not covered by the EU ETS. Projections suggest that France is on track for achieving this objective (Ecologic Institute and Eclareon, 2014).

Emissions intensity

The GHG emissions intensity of the French economy, i.e. the ratio between GHG emissions and GDP, declined by 23% between 2000 and 2013, a pace faster than the OECD average. Carbon intensity (CO_2 emissions due to energy consumption per unit of GDP) also dropped by 25% over the period 2000-13, compared to the OECD average of -22%.

The GHG emissions intensity of France is among the lowest in the OECD, at 0.21 tonnes of CO_2 equivalent per 1000 USD of GDP (at 2010 prices and purchasing power parity), compared to the OECD average of 0.39 tonnes. This reflects the heavy reliance on nuclear power, which is low in carbon emissions compared with fossil fuels.

3.4. Atmospheric emissions and air quality

Principal plans and programmes

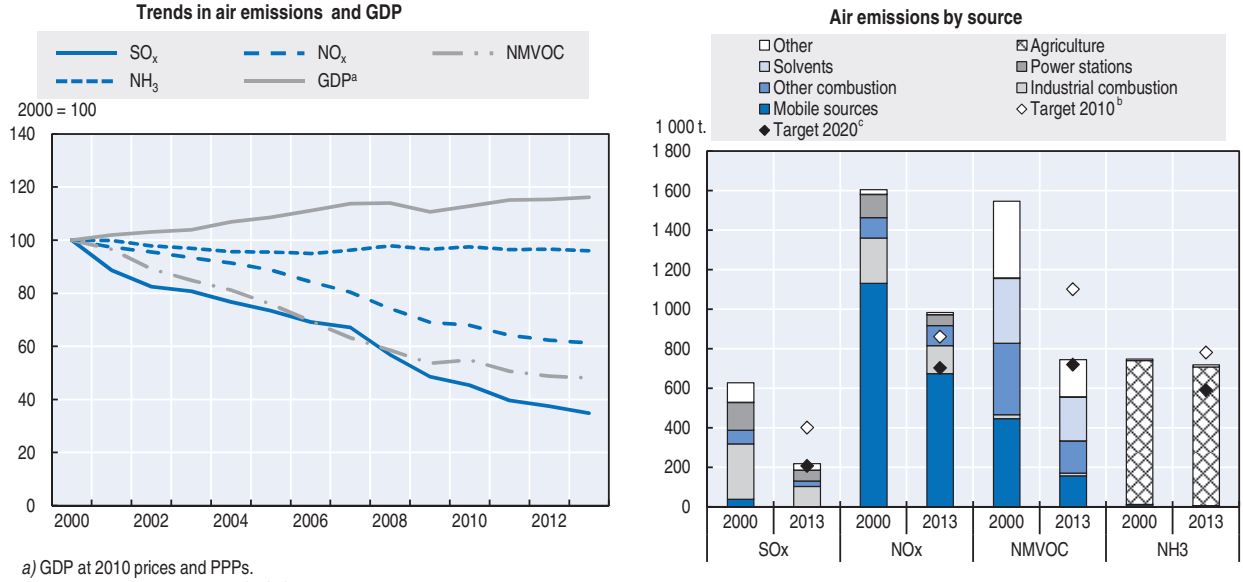
A number of plans for combating atmospheric pollution have been adopted at different levels of government (particulates plan 2010, emergency air quality plan 2013, national

environmental health plan 2004-08, 2009-13, 2015-19, regional environmental health plans, regional climate-air-energy schemes, plans to protect the atmosphere in major cities or in particularly polluted zones). They combine regulatory measures (for example technical prescriptions for combustion facilities), tax measures and incentives (such as the addition of substances to the general tax base for polluting activities, subsidies for modernisation of wood-burning devices) and provisions for policy co-ordination among local governments in the context of decentralisation laws (Chapter 2, Chapter 3, CGDD 2015b). The Energy Transition for Green Growth Act also contains provisions to enhance air quality. It includes the reduction of atmospheric pollution among the objectives of energy policy and calls for the revised national plan for reducing emissions of atmospheric pollutants to be published by June 2016.

Emissions profile

France has succeeded in decoupling emissions of the main atmospheric pollutants from economic growth (Figure 1.8). Its SO_x and NO_x emissions per unit of GDP are far below the average for the OECD. France has achieved its 2010 objectives under the EU Directive on national emission ceilings for certain atmospheric pollutants (2001/81/EC), with the exception of NO_x emissions, which exceeded the ceiling set for 2010 by 33% (SOeS, 2014).

Figure 1.8. **The objectives for reducing emissions of atmospheric pollutants have been met, except for NO_x**



a) GDP at 2010 prices and PPPs.
b) Targets set by Directive 2001/81/EC on national emissions ceilings for certain pollutants.
c) National target under the revised Gothenburg Protocol.
Source: EMEP (2015), *Officialy reported emission data* (database); OECD (2015), *OECD National Accounts Statistics* (database).

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The progress achieved since 2000 in reducing emissions can be explained largely by the enforcement of stricter regulations, the decline in fossil fuel consumption, energy savings, and deindustrialisation of the economy (Citepa, 2015).

Road transportation remains the principal source of NO_x emissions (54% of the total), despite a 43% drop since 2000 (Figure 1.8). The generalised use of catalytic converters, the tightening of vehicle emissions standards, and the renewal of the automobile fleet have

not been sufficient to offset the effects of growing traffic and the increasing share of diesel-powered vehicles in the vehicle fleet (62% in 2014) (SOeS, 2014) (Medde, 2015b).

NH_3 emissions dropped by only 4% over the period 2000-13. Agriculture, and livestock raising in particular, is the principal source of NH_3 emissions (98% of the total in 2013) (Figure 1.8). The fluctuations observed can be linked to changes in the size of the herd and the quantity of fertilisers used (Citepa, 2015).

There was a marked shift in the distribution of NMVOC emissions by source between 2000 and 2013. The relegation of road transport from first to third place was due primarily to the equipping of petrol-powered vehicles with catalytic converters, but also to the growing share of diesel-powered vehicles that emit less NMVOC. In 2013, the use of solvents was the biggest source of NMVOC emissions, followed by non-industrial combustion (in particular the burning of wood in small domestic devices) (Citepa, 2015) (Figure 1.8).

Fine particulate emissions have continued to decline since 2000. As of 2013, those emissions had already dropped by 26%, and France had therefore virtually achieved the goal (set by the Gothenburg Protocol) of reducing $PM_{2.5}$ emissions by 27% by 2020, from their 2005 level. Wood burning, mainly for domestic purposes, quarry operations, construction, ploughing and road transport are the principal sources of emissions (Citepa, 2015).

Air quality

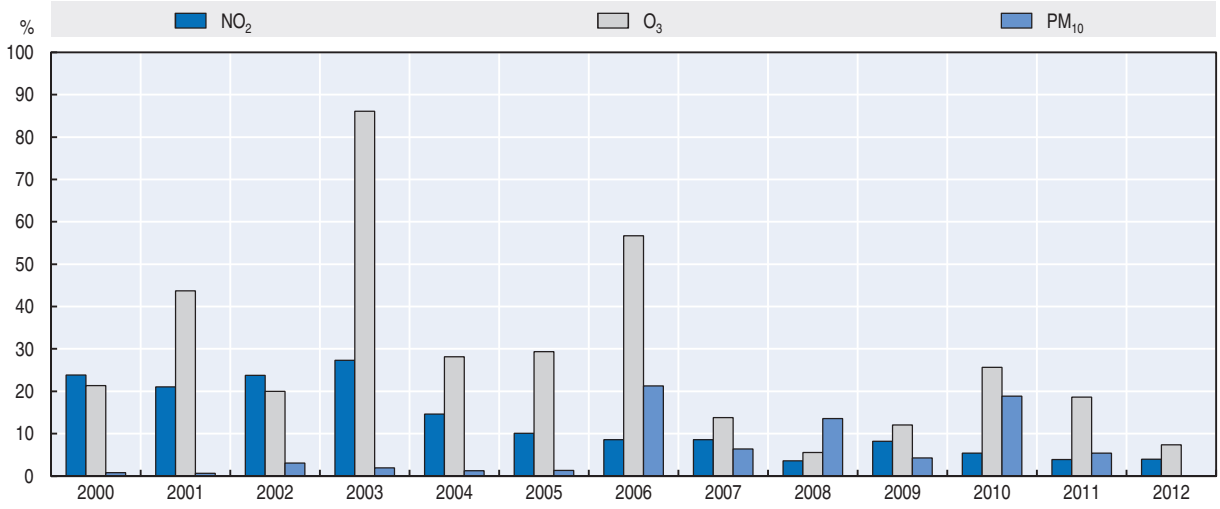
Since they came into effect, France has respected the limit values for the protection of human health set by the European directives (2008/50/EC and 2004/107/EC) for concentrations of SO_2, CO and lead. In 2014, most sampling points were also respecting the regulations for arsenic, cadmium and nickel content. However, 3% of sampling points were not respecting the regulations for benzo(a)pyrene (CGDD, 2015b).

In 2014, France was compliant with the threshold set by the European directive on concentrations of benzene, with the exception of an overrun at one industrial site. Those concentrations have been dropping since 2000, thanks to the limit placed on the benzene content of petrol (CGDD, 2015b).

Since European legislation came into effect in 2005, the maximum daily limits for PM_{10} have been regularly exceeded (Figure 1.9), most notably in 10 zones: Paris, Lyon, Grenoble, Marseille, Martinique, PACA-ZUR (Zone urbaine régionale), Rhône-Alpes-ZUR (Vallée de l'Arve), Nice, Toulon, and Douai-Béthune-Valenciennes. In 2011, the European Commission brought France before the Court of Justice for failing to respect EU legislation on air pollution and for not having taken sufficient measures to reduce such pollution. The Commission handed down a reasoned opinion on the subject in 2015. PM_{10} levels are higher on average in places close to vehicle traffic, and also in the winter and spring (SOeS, 2014). For $PM_{2.5}$, the fluctuations observed from one year to another are explained in part by meteorological conditions. Thanks to a mild winter in 2014, only one of 127 sampling sites exceeded the threshold for protection of human health set by the EU (CGDD, 2015b).

It is in urban areas, and particularly along the main highways, that NO_2 concentrations are highest. They declined on the whole over the period 2000-14 but remain twice as high in areas close to road traffic and in urban zones. The rising number of diesel vehicles and the evolution of diesel technology (certain diesel vehicles are equipped with particle filters that emit NO_2) explain in part why the European thresholds for the protection of human health have not been met (Figure 1.9). France is the target of European dispute proceedings for NO_2 (SOeS, 2014) (CGDD, 2015b).

Figure 1.9. **A declining percentage of the population is exposed to concentrations of atmospheric pollutants exceeding regulatory thresholds**



Source: EEA (2015), *AirBase* (database).

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As with NO_2 and fine particles, average annual concentrations of O_3 in the air vary with meteorological conditions. Although the situation has improved compared to early 2000, the European daily threshold is frequently exceeded, particularly in Île-de-France and in the PACA region (Figure 1.9) (CGDD, 2015b).

The many plans adopted to combat atmospheric pollution have not made it possible to respect regulatory thresholds. They are not very restrictive, they have no precise timetable for achieving their objectives, and they are not systematically assessed. Moreover, the lack of articulation between the documents established at the different territorial levels and the dispersion of responsibilities have impeded their implementation. For example, during the pollution spike in Paris in 2015, the alternate-day circulation authorisation requested by the Mayor of Paris was only granted by the Prefect one week later. Urban road tolls and restricted circulation zones where access is barred for the most polluting vehicles as called for in the Grenelle 2 Law were not established until 2015 (Box 1.1). The introduction in 2016 of the air quality certificate, which establishes a national identification standard for vehicles according to their pollution level, could facilitate enforcement of restricted circulation zones. However, the classification of older vehicles should be sufficiently refined to allow their circulation to be gradually restricted, as this would be more readily acceptable to the public. On the other hand, a coherent tax framework has yet to be adopted: the taxation of fuels and vehicles has favoured diesel, without considering the consequent harm in the form of air pollution (Chapter 3).

The OECD has estimated the health costs of air pollution (the cost of the 21 158 premature deaths linked to ambient air pollution by particulates and ozone in 2013) at close to EUR 54 billion or 2.5% of GDP (WHO/Europe and OECD, 2015). While a large part of this cost can be attributed to road transportation (notably to diesel vehicles), to residential heating, to industry and also to agriculture through NH_3 emissions, the precursor gas to secondary particulates, there are other important sources of air pollution as well (Ademe, 2015). Their contribution to the impacts on health deserves to be studied further.

Box 1.1. **Combating air pollution in Paris**

In 2014, more than 2.3 million residents in Ile-de-France were exposed to pollution that exceeded regulation levels for particulates and nitrogen dioxide. The Paris agglomeration and persons living near the main traffic arteries were the most affected. The city of Paris regularly experiences pollution levels that exceed the warning thresholds.

In 2015, the city of Paris adopted a plan to combat air pollution. It included:

- incentive measures: subsidies to purchase a bicycle, annual public transport passes, a reduction in subscription fees for the "Autolib" public electric car service in return for scrapping an old vehicle ; a reduction in the "Autolib" fees for young drivers ; grants for the construction of secure bicycle shelters, and the installation of recharge points for electric vehicles at Parisian apartment buildings; grants for the purchase of an electric or natural gas-powered vehicle for professionals who own old vehicles.
- The city of Paris is the first city in France to experiment with car-use restrictions. This measure will be applied to the entire perimeter of the capital, with the exception of the Paris ring road ("*boulevard périphérique*") and the woodland parks. Since 1 September 2015, vehicles of more than 3.5 tonnes and "class I star" (made prior to 2001) may not circulate in Paris between 8 AM and 8 PM. This ban will be extended progressively according to a pre-established schedule to other polluting vehicles by 2020.

Source: Airparif (2015), Surveillance et information sur la qualité de l'air à Paris en 2014; Paris Town Hall (2015), Ministry of the Interior (2015)

4. Transition to a resource-efficient economy

4.1. *Material consumption*

Since 2000 France's material productivity (defined as the amount of economic wealth generated per unit of material used) has risen by 31% (Figure 1.10). This increase can be attributed essentially to the economic crisis, which sparked a decline in domestic material consumption (DMC), in particular the use of construction materials, which account for nearly half (47%) of DMC, ahead of biomass used for food (25%) and fuels (17%) (Figure 1.10).

Infrastructure works on the "Grand Paris Express" project, as well as the construction of the housing related to that project (over the period 2019-30), could reverse this trend. They could also lead to a significant increase in inert waste deposits (Driee, 2015).

Ferrous and non-ferrous metal mining had virtually ceased in France at the beginning of this century. To meet its needs, France is therefore dependent on imports (SOeS, 2014).

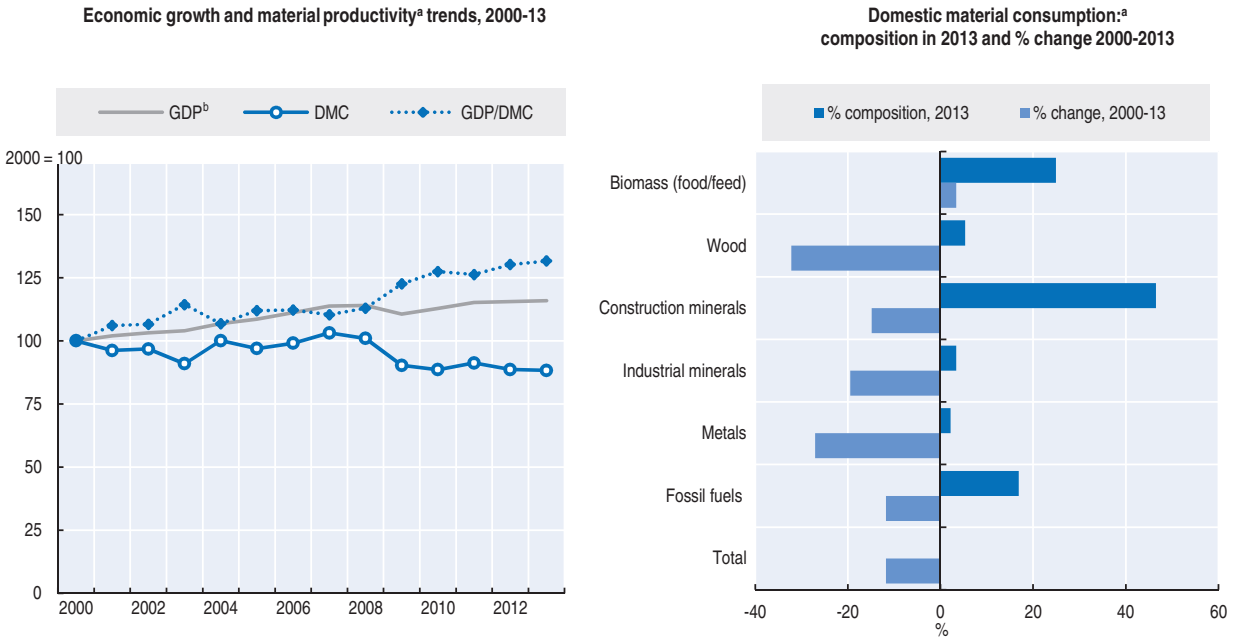
In 2010, DMC was 12 tonnes per capita. This figure takes into account only materials that were extracted, imported or exported in France. In raw material equivalent terms, i.e. taking into account indirect flows (materials used outside the territory), materials consumption was 15 tonnes per capita. Considering flows of unused materials as well, consumption rises to 26 tonnes per capita, or more than double the volume of apparent consumption (SOeS, 2014) (Figure 1.11).

4.2. *Waste management*

Principal plans and programmes

France was one of the first European countries to develop a national waste prevention plan: it did so in 2004, before the European Waste Framework Directive (2008/98/EC) made this mandatory. That plan was followed by the national plan to support household

Figure 1.10. **Resource productivity is rising**



a) Material productivity designates the amount of GDP generated per unit of materials used. It refers to the ratio of GDP to domestic material consumption (DMC), where DMC is the sum of domestic extraction of raw materials used by an economy and its physical trade balance. A rise in material productivity is equivalent to a decline in material intensity (i.e. DMC/GDP).
b) GDP at 2010 prices and PPPs.
Source: OECD (2015), *OECD Environment Statistics* (database); OECD (2015), *OECD National Accounts Statistics* (database); Eurostat (2015), *Material flow accounts* (database).

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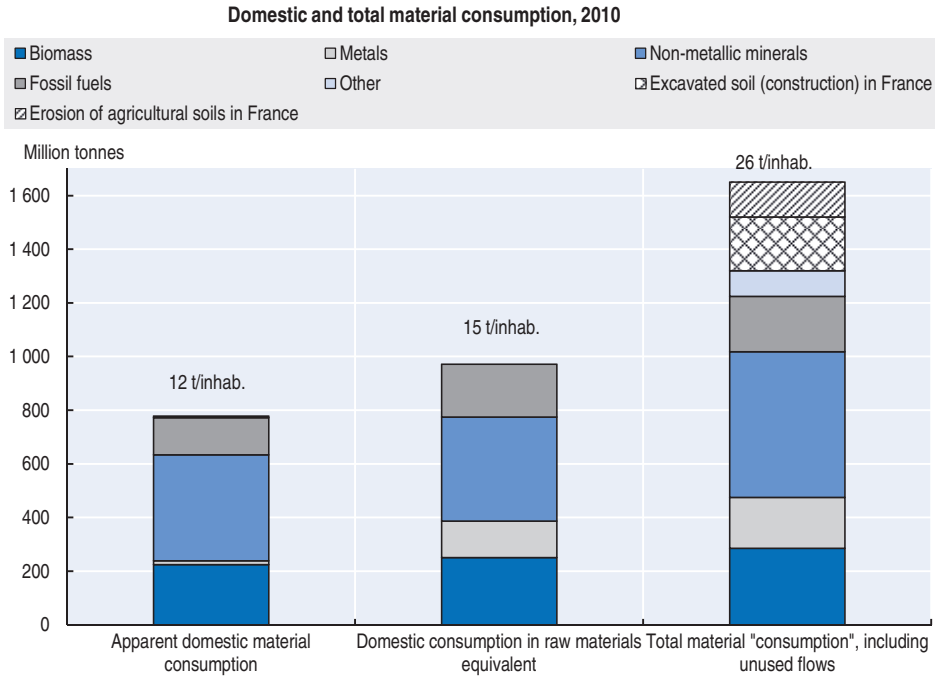
composting (2006) and the two Grenelle laws, the provisions of which were integrated into the waste action plan 2009-12 (Medde, 2014d). This last plan has fostered the implementation of territorial plans for waste prevention and management, as required by the Grenelle laws.

Following the 2013 environmental conference, which devoted a roundtable to the circular economy, a national waste prevention programme 2014-20 was drawn up, setting out objectives for decoupling and priorities for eco-design, prolonging product life, recycling, repair and reuse (Medde, 2014d). These efforts resulted in the inclusion of a section devoted to combating wastage and promoting the circular economy in the 2015 Energy Transition for Green Growth Act. It provides a five-year strategy for the circular economy, including a plan for programming the resources the economy will need and optimising their use. The law sets targets for: boosting material productivity by 30% between 2010 and 2020; reducing the quantities of household and similar wastes per capita by 10% between 2010 and 2020 and cutting the volumes of wastes from economic activities per unit of value produced, especially in the building and public works sector; reducing by half the volume of wastes dumped between 2010 and 2025 and achieving 65% material recovery by 2025. It prohibits the distribution of single-use plastic bags as of 1 January 2016.

Primary wastes

In 2012, France produced 339 million tonnes of primary waste[4], representing an increase of 17% from the level in 2004, while over the same period the waste produced by European countries as a whole fell by 3%. On a per capita basis, the volume of waste produced (including secondary waste[5]) stood at 5.3 tonnes in 2012, slightly above the European average (Figure 1.12).

Figure 1.11. **Materials consumption is twice as high when hidden flows are included**



Note: For flows expressed in raw material equivalent, volumes refer to the categories indicated (biomass, metals, etc.); for total consumption, each category covers apparent flows plus all associated hidden flows, including materials of different natures mobilised during the various economic steps (e.g. fuels associated with the importation of biomass) and unused materials (e.g. excavated soil during construction activities, agricultural soil erosion).
Source: SOeS (2014), *L'environnement en France.*

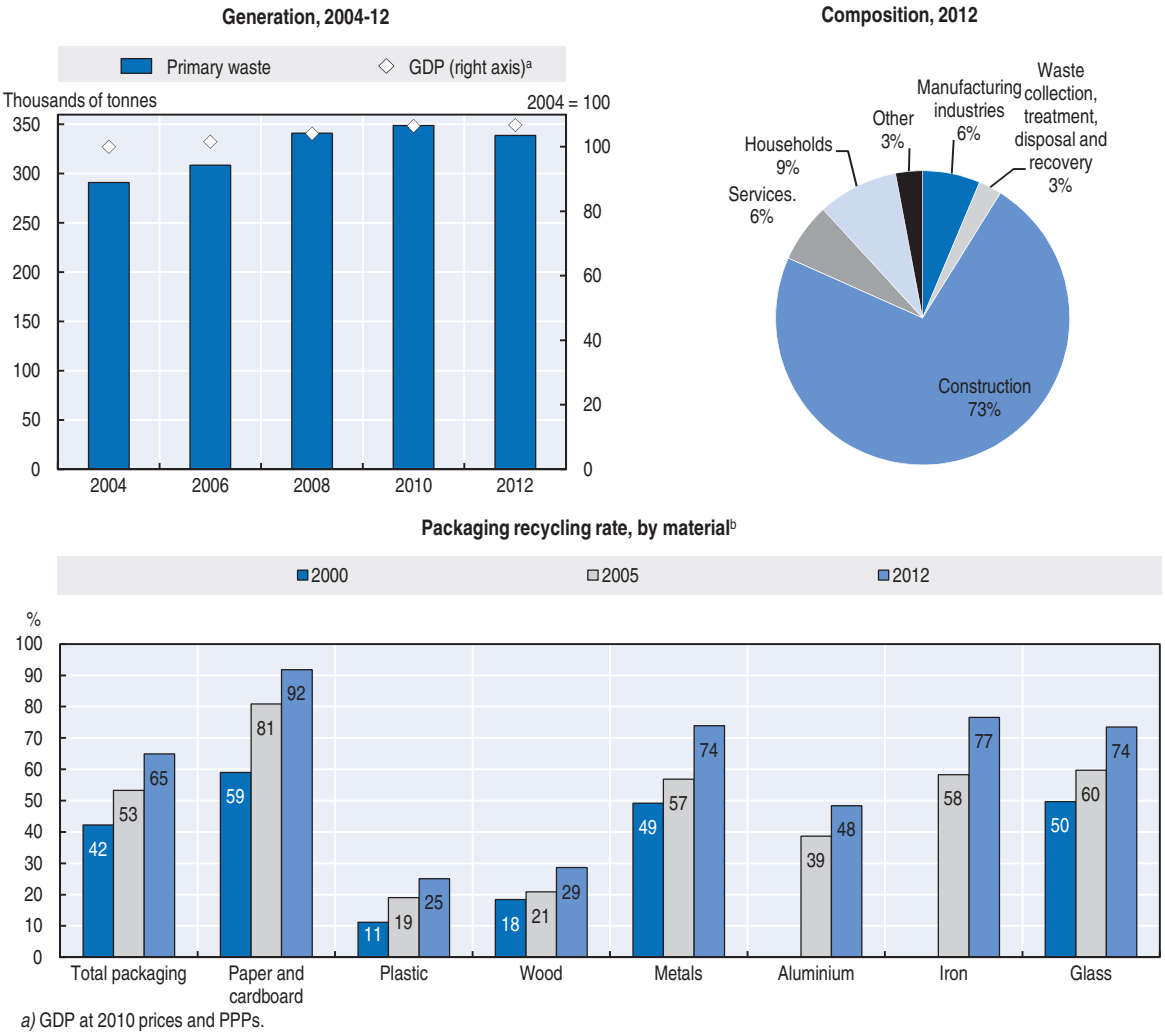
StatLink http://dx.doi.org/10.1787/888933405960

The bulk of waste is produced by the construction sector, followed by households, services and manufacturing industries (Figure 1.12). The production of primary waste rose by 20% between 2004 and 2010, and then declined by 3% between 2010 and 2012, reflecting the slowdown in the construction sector, which was hit particularly hard by the economic crisis. Apart from mining wastes, France generates 1.5 tonnes per capita of primary waste, below the European average (1.8 tonnes per capita).

In 2012, 64% of primary waste was recovered – either recycled, composted or incinerated with energy recovery – and that proportion was virtually unchanged from 2004. The recycling rate for packaging wastes in 2012 was 65%, and the total recovery rate was 75%, but there were sharp disparities depending on the materials in question: while 92% of paper and cardboard packaging collected was recycled, only 25% of plastic packaging and 29% of wood packaging was recycled. The rates for all packaging materials were however up from their level in 2000 (Figure 1.12).

In France 22 product groups are covered by Extended Producer Responsibility (EPR), more than in any other country. According to this principle, producers bear the responsibility (financial in particular) for managing their discarded products. Fourteen new product groups were added between 2006 and 2015, seven of them imposed by national regulation beyond European obligations,[6] and one based on a voluntary agreement[7] (Ademe, 2013).

Figure 1.12. **Primary waste volumes are rising**



a) GDP at 2010 prices and PPPs.
b) Percentage of collected materials sent for recycling.
Source: Eurostat (2015), *Generation of waste* (database); OECD (2015), *OECD National Accounts Statistics* (database); SOeS (2014), *L'environnement en France.*

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Municipal waste

France has decoupled its municipal waste generation from economic activity. This decoupling is only relative: the volume of municipal waste has risen (8%) less quickly than GDP (16%) since 2000 (Figure 1.13).

In 2014, France produced 510 kg of municipal waste per capita, above the European average (480 kg per capita). However, the volumes produced per capita have dropped since the economic crisis, with the slowing of private final consumption (OECD, 2015g).

In contrast to some northern European countries (Netherlands, Sweden, Austria, Germany), France has not banned the use of direct landfill for municipal waste. Therefore, despite a 35% decline between 2000 and 2014, stored municipal waste still accounted for 26% of the volumes handled in 2014. However, the volume of recovered municipal waste represented 73% of the quantities handled in 2014, compared with only 53% in 2000. This progress has been made possible by the opening of sorting and composting facilities

Figure 1.13. **Municipal waste production is slowing, while waste recovery is progressing slowly**

a) Private final consumption (PFC) at 2010 prices and PPPs.
b) GDP at 2010 prices and PPPs.
c) Prior to 2010 recycling amounts refer to volumes entering the facilities (after 2010 they refer to volumes leaving the facilities).
Source: OECD (2015), *OECD Environment Statistics* (database); OECD (2015) *OECD National Accounts Statistics* (database); OECD (2015), *OECD Economic Outlook No 98* (database); SOeS (2014): *L'environnement en France*.

StatLink http://dx.doi.org/10.1787/888933405982

between 2000 and 2006, as well as the closure of landfill sites and the shutdown of numerous incinerator plants that were not recovering energy (Figure 1.13) (SOeS, 2014).

The objective of the 2009-12 waste action plans relating to the reclamation of household and similar wastes has been achieved, but it was not very ambitious: in 2014, 39% of municipal waste was recycled or composted, a rate well below those for Germany (65%), Austria (58%), Belgium (50%) or the Netherlands and Sweden (50%).

4.3. Agriculture

Agricultural inputs

France is the leading agricultural producer in the European Union. Its output has declined slightly since 2000. Excess nutrients (nitrogen and phosphorus) have also declined, both in absolute terms and per hectare of farmland. In 2010, the highest nitrogen surpluses were

to be found mainly in the intensive livestock raising zones of Western France, especially in Brittany (the Massif armoricain) (SOeS, 2014).

Over the same period, the phosphorus load fell by 50%, thanks in part to the generalised resort to soil analysis, carried out by the government in order to rationalise fertiliser use. The sharp price volatility of phosphates (prices soared by 700% in 2008, then collapsed during the crisis, and have been rising again since 2011) has also been a key factor behind this downward trend. Phosphate content is especially high in Brittany, due to intensive livestock raising, as well as in Nord-Pas-de-Calais and Alsace, where industrial slag was used on a massive scale in the past (SOeS, 2014).

Pesticides

The presence of pesticides in watercourses and in groundwater is a matter of concern. In 2011, pesticides were detected in 93% of watercourse analyses done in metropolitan France and in 85% of those conducted in Guadeloupe, Martinique and Reunion. This situation is virtually unchanged from the late 1990s. Such pollution is due primarily to the use of herbicides in metropolitan France and insecticides overseas (SOeS, 2014). In 2013, France ranked second among European countries, behind Spain, in terms of the quantities of active pesticide substances sold (Eurostat, 2014). In 2010, it stood eighth in the world ranking (FAO, 2014).

The pesticide content of groundwater is somewhat lower than in watercourses, but the situation has changed very little since 2000. All territories are affected by this pollution, and quality standards relating to pesticide concentrations were exceeded at 18% of sampling points in 2011 (SOeS, 2014). Pesticides are also a source of air and soil pollution for which current control measures are inadequate.

France is unlikely to meet the Ecophyto plan's target of a 50% cut in the consumption of phytosanitary products. Since its launch in 2008, the plan has not yielded the expected results: while pesticide sales have fallen, the global quantitative monitoring indicators of usage show no downward trend (MAAF, 2014). In particular, the "number of unit doses" (Nodu), which calculates the average number of treatments per hectare of farmland, rose by 29% between 2008 and 2014 (Figure 1.14). As a result, France has pushed back the achievement of this objective by separating it into two stages: a 25% reduction in consumption of phytosanitary products by 2020, on the strength of measures already in place for optimising production systems, and a 50% reduction by 2025, to be made possible by more significant changes to production systems, scientific and technological progress, crop diversification and conversion to organic farming (MAAF, 2014).

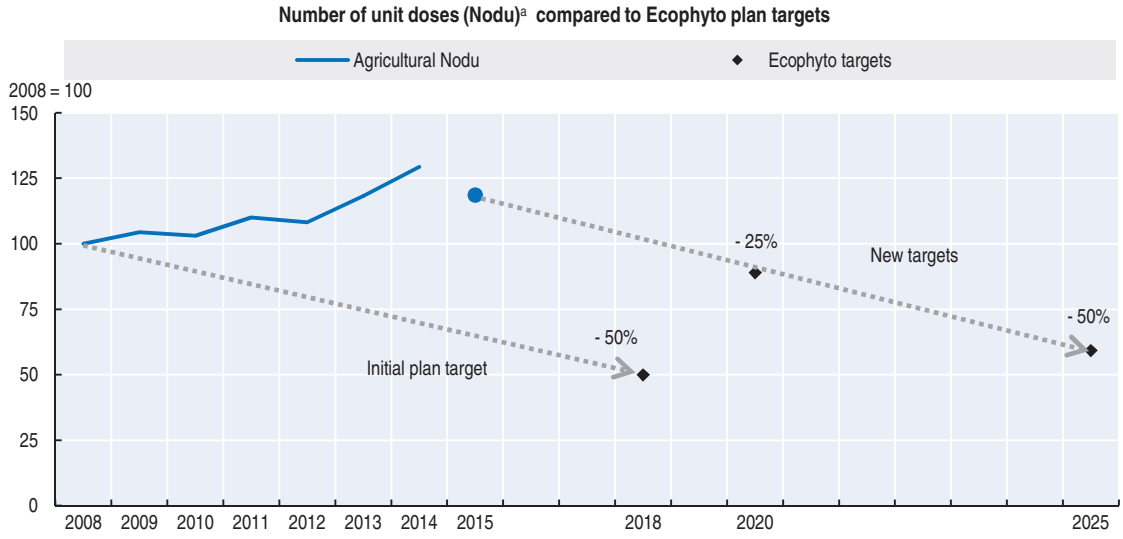
5. Managing the natural asset base

5.1. *Physical context and land use*

With a territory of 549 000 km^2, France is the largest country in the European Union, and it harbours a large variety of landscapes. It is bordered to the north and the west by the North Sea, the Manche or English Channel and the Atlantic Ocean and to the south by the Mediterranean, giving it some 5 500 km of coastline. The country has impressive mountain ranges along its eastern and southern flanks, and is traversed by broad fluvial plains. France also possesses a number of overseas territories, including many islands.

In 2012, agricultural lands (arable lands and croplands, plus meadows and pasture land) occupied 53% of metropolitan France, down by 9% from 2000. It is the meadows or grasslands that have lost the most surface area (-8%), while cultivated lands have declined

Figure 1.14. **Pesticide use is rising**



a) The number of unit doses relates the quantity of an active substance to a specific unit dose. 2015 is estimated as a 3-year average 2012-2014.
Source: SOeS, (2015), *Indicateurs de développement durable nationaux.*

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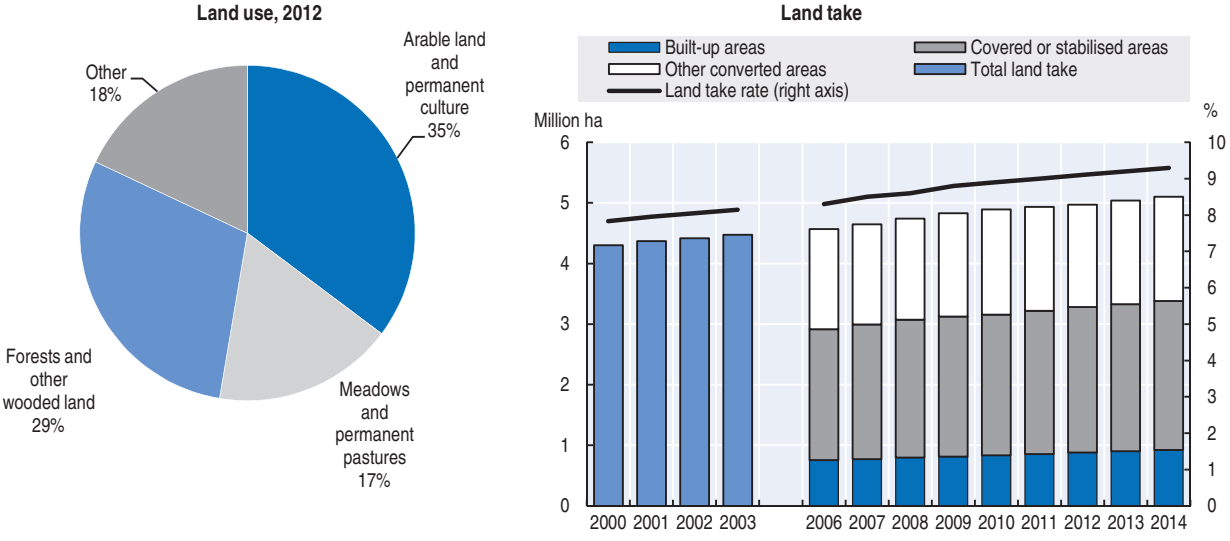
by only 1%. Over the same time period, forested areas has increased by 5%, and other types of surface by 3% (Figure 1.15).

Land take amounted to more than 9% of the territory in 2014, up by 19% from 2000, with a clear acceleration since 2006. Built-up land areas have expanded most rapidly, in particular those destined for economic activities (waste processing, commercial and service enterprises) as well as those allocated to public facilities, particularly for sporting activities. Paved or stabilised areas increased by 14% over the same period, reflecting in

Figure 1.15. **Land take is accelerating**



Source : FAO (2015), *FAOSTAT* (database); MAAF (2015), *Enquête "utilisation du territoire – Teruti-Lucas"* (database), Service de la statistique et de la prospective.

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particular the construction of highways and motorways, which account for 80% of this type of land (Figure 1.15) (SOeS, 2014).

Urbanisation has traditionally taken place around the periphery of cities and along the coastline. However, recent years have seen another, more diffuse trend, with the urbanisation of areas increasingly remote from large agglomerations and the coast, particularly along transportation routes and the country's frontiers (SOeS, 2014).

This urban sprawl tends to boost energy consumption and hence GHG emissions. It is estimated that 51% of households living on the periphery of urban zones have at least two cars, versus 20% of households living in the city centre. However, some studies have found that suburban households take fewer vacations and weekend trips than those living in central areas, and this would tend to balance their energy consumption (Medde, 2011).

Land take is happening primarily at the expense of farmland and woodland, and it has many impacts on the environment. For example, it prevents rainwater from penetrating into the soil and it increases runoff, thus provoking soil erosion while obstructing recharge of the water table. It also fragments habitats and ecosystems, thereby diminishing and even destroying local biodiversity (Medde, 2011).

5.2. Biodiversity and ecosystems

France is the second largest maritime state after the United States. With its overseas areas, it holds the distinction of having territories in the Atlantic, Indian, Pacific and Southern Oceans. As a result, the country harbours a great diversity of terrestrial and marine ecosystems. French territorial waters cover more than 10 million km^2, representing nearly 20 times the land area of metropolitan France (SOeS, 2014).

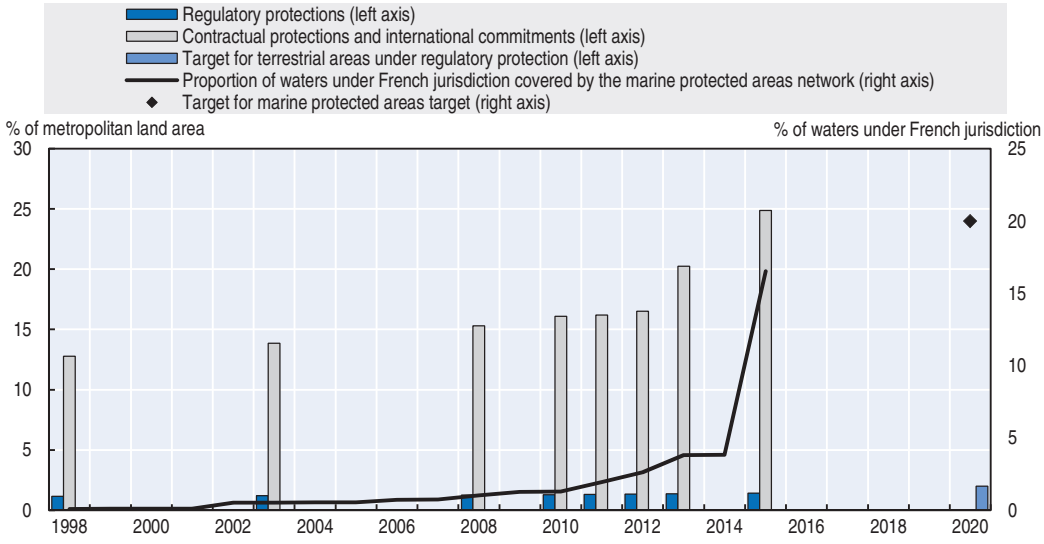
Protecting ecosystems and biodiversity is thus a major issue for France. Urbanisation and habitat fragmentation, intensive agriculture, forestry and mining operations, as well as invasive alien species and climate change all pose significant threats to the country's biodiversity (SOeS, 2014).

Protected areas

France has already achieved the objectives, defined in the context of the Convention on Biological Diversity, of protecting at least 17% of its land area and at least 10% of its territorial waters by 2020 (Figure 1.16). As of 2015, however, barely 0.7% of metropolitan France was covered by protected areas in categories I and II (the strictest protection levels) of the International Union for the Conservation of Nature (IUCN) classification, compared to the OECD average of 3%. The level of protection is considerably higher overseas (Guadeloupe, French Guiana, Martinique, Mayotte, Reunion, Saint Pierre and Miquelon, Saint Martin, Saint Barthélemy and the French Southern and Antarctic Lands), where category I and II protected areas cover 23% of the territory.

France relies primarily on two types of management for protected areas: the regulatory route and the contractual route. Human activity is banned or limited in the areas under regulatory protection, such as the core areas of national parks, natural reserves etc. (categories I to IV of the IUCN classification). Contractual protection (category V of the IUCN classification) seeks to reconcile preservation of the natural heritage and local development by involving the various users of the territory (community-controlled buffer zones or aires d'adhésion adjacent to the core area of national parks, regional natural parks [PNR] and marine natural parks) (SOeS, 2014).

Figure 1.16. **Protected areas are expanding in metropolitan France**



Source: MNHN-INPN (2015), *Espaces protégés* (database); SOeS (2014), *L'environnement en France*; French Agency for Marine Protected Areas (2015).

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In 2015 the area under regulatory protection was 45% greater than in 1998, and represented 1.4% of the metropolitan territory. However, France is far from reaching its objective of having 2% of its territory under regulatory protection by 2020, as proclaimed in the Grenelle I Law of 2009. Between 1998 and 2015, the surface area under contractual protection nearly doubled, to 25% of the territory (INPN, 2015). The 49 PNRs, which represent the majority of these areas (7 million hectares), constitute the first territorial ecological infrastructure (Figure 1.16).

Overseas (in Guadeloupe, French Guiana, Martinique, Mayotte, Reunion, Saint Pierre and Miquelon, Saint Martin, Saint Barthélemy and French Antarctica), the areas under regulatory and contractual protection both cover a virtually identical share of the territory (35%) (INPN, 2015).

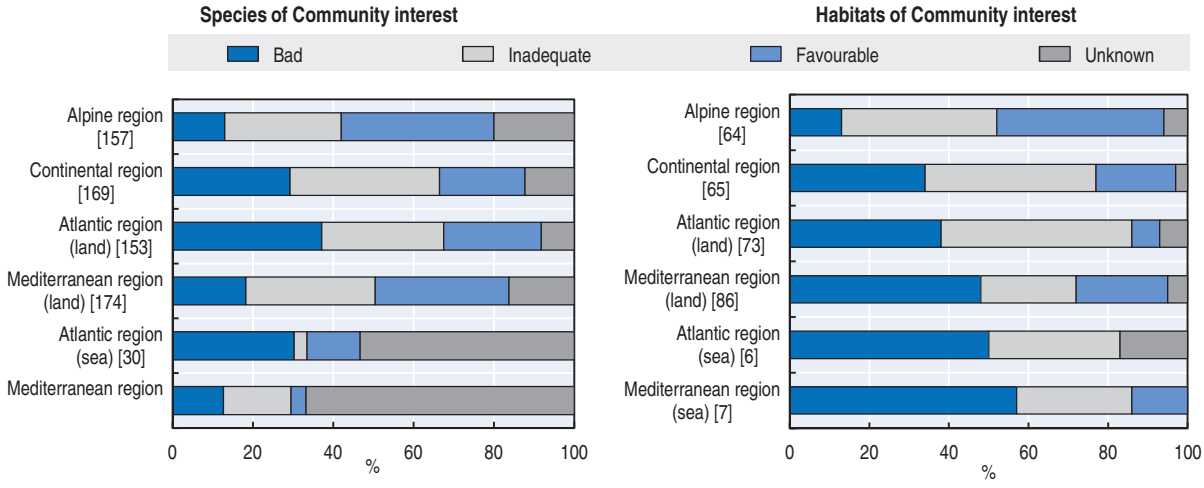
In 2015, the marine protected areas (including those overseas) covered 16.5% of waters under French jurisdiction. The recent increase reflects the creation of the Coral Sea Natural Park in New Caledonia (1.29 million km^2). The country has set itself a target of protecting 20% of waters under its jurisdiction by 2020 (Medde, 2014b).

Natura 2000 ecological network

The Natura 2000 network gives effect to the European "Habitats, Flora and Fauna" and "Birds" directives via the creation of special conservation zones (ZSC) and special protection zones (ZPS). The ZPS target the conservation of wild bird species listed in Annex 1 of the "Birds" Directive, as well as the protection of breeding, moulting and wintering areas and staging posts for migratory species not listed there. The ZSC target the conservation of habitat types and of animal and plant species listed in annexes I and II of the "Habitats" Directive (INPN, 2015). These sites, which in 2013 represented 12.6% of the metropolitan territory and 12.3% of waters under French jurisdiction, are managed under the contractual approach. For the most part, they are concentrated in regions along the eastern border of France and the Mediterranean coast, and in the Pyrenees.

Over the years 2007-12, more than half of the species of European Community interest evaluated revealed an unfavourable state of conservation, while the conservation status of 18% of the species (primarily marine species, lichens and certain invertebrates) was unknown. The Atlantic and continental biogeographical regions are the most affected: the conservation status of 70% of their fauna and flora is considered "unfavourable-inadequate" and "unfavourable-bad" (Figure 1.17). Only the flora of the Alps and the fauna of the Mediterranean are in a good state of conservation. In the absence of data and information on marine species it is not possible to make a full assessment of their conservation status (INPN, 2015).

Figure 1.17. **Most habitats and species of Community interest are not in a good state of conservation (2007-12)**



Note: Bracketed numbers indicate the number of assessments performed.
Source: SOeS (2014), *L'environnement en France*.

StatLink http://dx.doi.org/10.1787/888933406029

Over the same period, three quarters of the habitats of Community interest evaluated presented an unfavourable situation, a finding similar to the previous assessment (Figure 1.17). It is the marine and coastal habitats, dunes, bogs and fens, as well as freshwater habitats that are in the worst shape, regardless of the region. The same holds for grasslands, only 13% of which have a "favourable" conservation status. This is explained primarily by agricultural abandonment and intensification, as well as by urbanisation (INPN, 2015).

Threatened species

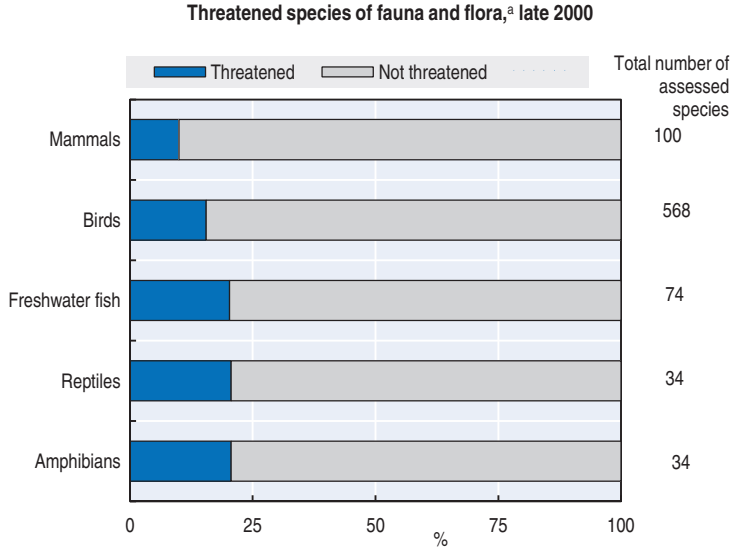
France is one of the 10 countries worldwide that are home to the greatest number of threatened species, as a result of the pressures exerted on biodiversity in the overseas areas as well as in the Mediterranean region, which is regarded as a biodiversity "hot spot" (SOeS, 2014).

In metropolitan France there are some 6 000 species of "higher plants", placing the country in fourth position in Europe. France is also home to the greatest number of bird species and vascular plant species in Europe, and ranks third in amphibian species (Figure 1.18). The country therefore has an important role to play in conserving the European heritage of fauna and flora (INPN, 2015).

In 2014, it was estimated that one species in five was threatened in metropolitan France. However, the level of knowledge on many species and their habitat is uneven and inadequate for taking stock of their status at the national level. Vertebrates alone have been the subject of monitoring for several decades now. The results show an improvement for some species, such as the otter, the beaver, the wolf and certain wintering water birds. It is estimated that 15% of indigenous vertebrates, including marine species, are under threat (endangered or vulnerable) – these rates vary from 8% for fish to 31% for amphibians. However, the status of marine fish is not known with certainty. Considering only freshwater or brackish-water fish, the rate is 51%. The number of specialist birds (habitat-specific) is also declining, while generalist birds (occupying a range of habitats) show a net increase. Not enough is known about invertebrates to evaluate their status precisely, but it is apparent that their habitats are suffering significant degradation (SOeS, 2015) (INPN, 2015).

With respect to the non-indigenous species evaluated, around 10% of mammals, 15% of birds and 21% of reptiles and amphibians are threatened: these rates are relatively low comparison to those for most OECD member countries (Figure 1.18).

Figure 1.18. **In metropolitan France, one species in five is threatened**



a) IUCN categories "critically endangered", "endangered" and "vulnerable" in % of assessed species.
Source: OECD (2015), *OECD Environment Statistics* (database).

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The overseas areas (including New Caledonia and French Polynesia, but excluding Adelie Land) give France an exceptional degree of biodiversity. They are estimated to harbour 96% of the vertebrate fauna and 97% of the vascular plants specific to France (SOEs, 2014). These territories also exhibit a high degree of endemism due to their insularity (INPN, 2015).

The available data are inadequate for taking thorough stock of the status of fauna and flora in the overseas areas. The French "red list" of threatened species indicates that 45% of the reptile species of Reunion are threatened; the equivalent rate for freshwater fish is 33%, and for vascular plants 30%. That list also shows that 33% of nesting bird species in Guadeloupe are threatened (MNHN, 2014). According to the international assessment conducted by IUCN in 2013 of the vulnerability status of biodiversity in the overseas areas, it is apparent that these are home to a significant number of threatened species.

Forests

With more than 16 million hectares of forest, France ranks third among European countries in terms of its forested area. In 2012, forests represented 29% of the French territory, up by 5% from 2000 (Figure 1.15). Yet this trend, linked to the increase in hardwood and mixed forest, masks a decline of around 30 000 ha per year in non-forest wooded areas, such as hedges, groves and tree rows. These scattered natural features, which are found in agricultural and urban settings, in fact play an essential role as natural habitats, but also as linkages between environments. On the other hand, the growth in forested areas at the expense of farmland (also referred to as "agricultural abandonment") has the effect of diminishing chalk grasslands, which are rich in orchids and invertebrates. Moreover, this loss of biodiversity is not being offset by any gain in forest biodiversity, as most forested areas are young and destined for exploitation (SOeS, 2014).

Three-quarters of the forest land in metropolitan France (12.2 million hectares) is privately owned. This includes 1.9 million hectares of plantations, representing 12% of the forested area, which are for the most part planted in conifers, while 67% of the French forest as a whole is comprised of hardwood species. The remaining 88% of forest cover consists of semi-natural, essentially mixed forest (IGN, 2014).

Of the total forest area in metropolitan France, only 1.3% is under strict biodiversity protection (categories I, II and IV of the IUCN classification). This proportion, far lower than that to be found in Scandinavia or North America, is due in part to French property ownership arrangements and also to the country's high population density, both of which make it difficult to create large contiguous reserves. On the other hand, nearly a quarter of the forested area is classed as "protected inhabited spaces", i.e. it falls under category V, corresponding essentially to the Regional Natural Parks (PNR). (IGN, 2014).

Although there has been an improvement in recent years, the defoliation rate (an indicator of tree vitality) has risen by 14% for hardwoods and by 17% for conifers, over the levels prevailing in the late 1990s. In other words, the health status of the tree species studied is deteriorating slowly, mainly because of climatic fluctuations (in particular the storms of Christmas 1999 and the drought of 2003) and the impact of human activities (Medde, 2014c).

The overseas areas, and French Guiana in particular, endow France with more than 8 million hectares of primary forests and forest ecosystems that shelter a rich biodiversity. Illegal gold mining is the biggest threat posed by human activity for the Guyanese forest. It results in the clearing of forest lands along small watercourses, the pollution of soils and surface waters by mercury and suspended particles, and a decline in fish and game stocks, in addition to indirect consequences for human health and the way of life for local inhabitants. In New Caledonia, where the forest is highly endemic, it is nickel mining that poses the greatest threat: it is responsible for the pollution of watercourses around mining sites, as well as of river waters flowing into the lagoon (Medde, 2014c).

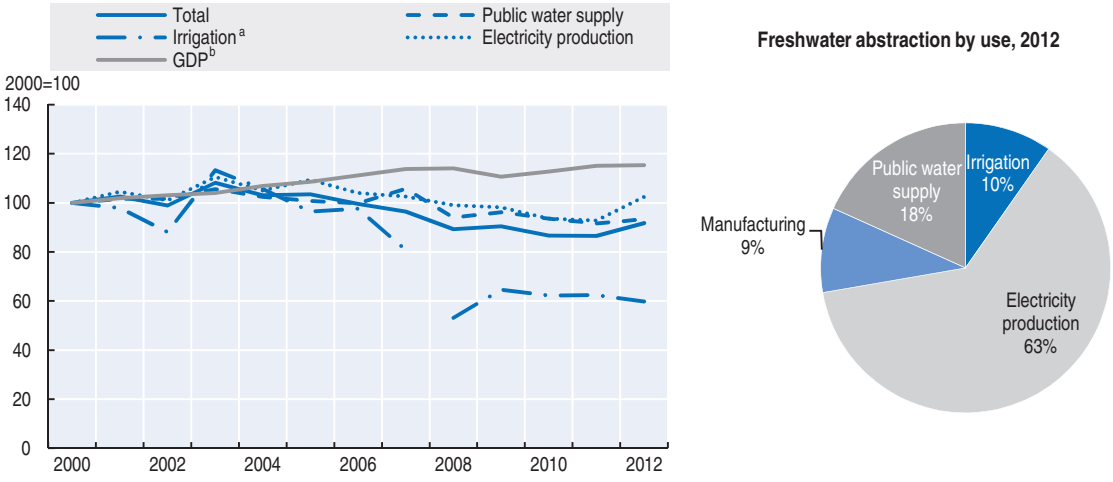
To address these environmental challenges, the government has instituted a departmental plan for mining guidance (schéma départemental d'orientation minière, SDOM) in French Guiana, which came into force at the end of 2011. It prohibits all mining activity in certain zones, and authorises or limits it in other zones. It also establishes a legal framework for gold mining, intended to take into account environmental externalities and to ensure the rehabilitation of degraded sites (Medde, 2014c).

5.3. *Water resource management*

Water resources

France has around 2 980 m^3 of renewable freshwater per capita, less than that of the majority of OECD countries. In 2012 it extracted around 30 billion m^3 of water, or 16% of its renewable resource, thus placing the country in a situation of moderate water stress. In relative terms, France extracted 472 m^3 of water per capita in 2012, down by 15% from 2000: this constitutes a level below the OECD Europe average (around 518 m^3/capita) and below the overall OECD average (829 m^3/capita) (Figure 1.19).

Figure 1.19. **Water abstraction is declining**



a) Break in time series in 2007 and 2008.
b) GDP at 2010 prices PPPs.
Source: OECD (2015), *OECD Environment Statistics* (database); OECD (2015), *OECD National Accounts Statistics* (database).

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With the exception of energy-producing industries, all users have reduced their water abstractions since 2000. After a peak due to the 2003 drought, total abstractions declined steadily until 2011, but they rose again in 2012 with the increase in abstractions for electricity production (Figure 1.19).

The drop in abstractions for production of drinking water is due in part to technological advances that have made household electric appliances and sanitation equipment more economical in their use of water, as well as to a shift in the habits of individuals, who are more sensitive to environmental concerns. The repair of leaks in the water distribution system has also helped in this regard, although there is much progress yet to be made in this area (SOeS, 2014).

Abstractions for irrigation are seasonal and vary with precipitation levels and the type of crop. In 2010 it was estimated that only 6% of farmland was irrigated, a figure virtually unchanged from 2000 (SOeS, 2014).

Water is still a resource under relative pressure, and it is important to preserve it. A study of surface waters covering the period 1968-2007 showed that the severity of low-water events was worsening and that the average annual flow was declining significantly, especially in the South. To address these concerns, France has implemented a benchmark system for the surveillance of low water flows (Réseau de référence pour la surveillance des étiages, RRSE).

Other studies have shown that the water table is dropping in certain areas. However, the report conducted under the Water Framework Directive indicates that, in 2013, 90% of the groundwater resource was in a "good quantitative state" (SOeS, 2014) (Onema, 2012).

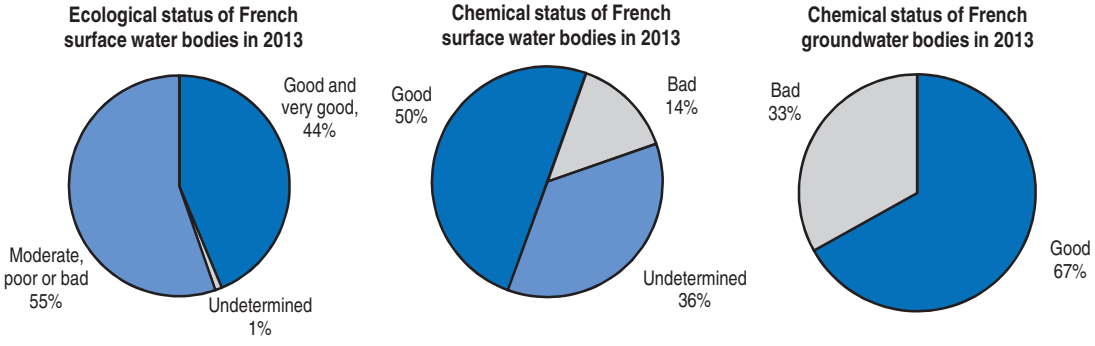
Water quality

In 2013 more than half of surface waters in France were in a poor ecological state, and for 36% the chemical state was unknown. The results are more encouraging for subterranean waters, where the chemical state was considered good for 67% of the bodies that were assessed (i.e. roughly 2/3 of the existing bodies). These ratings are however below the European average (80%).

The pollution of watercourses by organic and phosphorous materials, in particular phosphates and ammonium, has declined in the wake of stricter standards for detergents and the falling use of phosphate fertilisers (SOeS, 2014). Orthophosphates and nitrates are still important sources of watercourse pollution. The European Court of Justice found France in breach of the European directive on nitrates in 2013 and 2014, deeming its action programmes inadequate. Despite shifting agricultural practices, there is as yet no observable improvement in the concentrations of nitrates and pesticides in water (Medde, 2015).

Like the majority of European countries, France has requested a postponement (to 2021) of the target dates concerning the ecological status of its surface waters, deeming itself incapable of achieving the "good status" objective set for 2015 by the EU Water Framework Directive (WFD) (Figure 1.20). It is also among the six European countries that have asked for the most exemptions with respect to groundwater quality (SOeS, 2014).

Figure 1.20. **France will not achieve its water status objective in 2015**



Source: SOeS (2014), *L'environnement en France*.

To achieve its objectives, France has implemented master plans for water planning and management (Schémas directeurs d'aménagement et de gestion des eaux, SDAGE) in 12 major river basins, along with measurement programmes that are revised every six years and are managed in metropolitan France by the water agencies (Agences de l'eau) and in the overseas departments by the water offices (Offices de l'eau) (SOeS, 2014).

Water supply and sanitation

In 2013, 82% of the French population was connected to a public wastewater treatment network, and 18% to an independent sanitation system. While the proportion of the population connected to a treatment network has remained stable since the year 2000, the

percentage of residents connected to an independent treatment system has risen by 14% over the same period. In 2013, 33% of the population was connected to a secondary-type treatment system, and 22% to an "advanced" treatment system. The type of treatment to which 25% of the population is connected is unknown. This relates in particular to the rural population, connected to small purification stations that are not subject to systematic supervision and for which information is therefore incomplete (OECD, 2015h).

In order to comply with the European Urban Wastewater Treatment (UWWT) Directive, France has made major investments to bring up to standard its urban purification plants with a capacity exceeding 2000 population equivalent. At the end of 2013 it was estimated that 91% of those plants were compliant in terms of treatment, and 96% in terms of equipment (SOeS, 2014).

The situation in the overseas departments (DOM) is hampering France's efforts to achieve its objectives under the European water and wastewater directives. This is due in particular to the size of the river basins, to the fact that the "water offices" were only recently created, and to the scarcity of funding (low tax revenue potential) and technical capabilities available. Since 2013 the DOM have fallen well behind in complying with the UWWT directive, and are thus a priority for France. Upgrading the equipment is heavily dependent on inter-basin solidarity, given the sizable financial investments required. (Levraut et al., 2013).

In April 2015, the European Commission took France before the EU Court for failing to comply with the legislation on urban wastewater treatment. The EU cited some 17 agglomerations as not having waste water treatment up to EU standards. France was first warned in 2009 about this matter, which concerns areas with a population equivalent ranging between 2 000 and 15 000 (EC, 2015).

The average national rate of loss from the drinking water networks is estimated at around 30%, or 20% if sanitation networks are included. This rate could be as high as 80% in rural areas, where the networks are more seriously degraded. The Grenelle 2 Law sets an overall performance objective of 85%, leaving 15% for losses. The public water utilities will therefore have to improve their surveillance systems and establish an action plan for the end of 2015 (Levraut et al., 2013, Cours des comptes, 2015).

However, 99.5% of the French population has access to drinking water of very high quality. The bacteriological and physical-chemical conformity rates were 99.4% and 99.2% respectively in 2012. Around 65% of drinking water comes from subterranean sources and the remainder from surface water, with some regional disparities. The regions of Brittany, Ile-de-France and Midi-Pyrénées rely essentially on surface water while the Northeast is supplied primarily from groundwater (Onema, 2015).

Water governance

The system of integrated management by watershed basin with decentralised and participatory governance is the strong point of French water policy, recognised by all stakeholders as "a fundamental achievement that must be preserved" (Levraut et al., 2013). The national government prepares water policy in line with European directives, while planning and financial incentives are handled at the individual river basin level through "basin committees"[8] and the water agencies. The responsibility for project oversight as well as management of the resource and services falls essentially to the local authorities, within a regulatory framework set by the State. A great diversity of stakeholders, including users

and the local and regional authorities, is involved in the design and implementation of water policies (OECD, 2012, Cour des Comptes, 2013).

Nevertheless, the large number of stakeholders, the complexity of their interaction and the dispersal of responsibilities tend to undermine effective governance and policy implementation. At the national level, water policy is not sufficiently taken into account by sector policies (e.g. agriculture, urban development and energy) (Levraut et al., 2013). Sub-nationally, the decentralised government services at the watershed, regional and departmental levels suffer from a dispersion of co-ordination functions. At the local level France has more than 35 000 water and sanitation utilities, most of them too small to reap economies of scale (Cours des comptes, 2015). The consolidation of these utilities, as called for in the Notre Law, should improve their performance (Chapter 2).

Recommendations on air and waste management

Air management

- Adopt and implement the national plan to reduce emissions of atmospheric pollutants, coupled with a precise timetable in order to ensure compliance with standards for the protection of human health; clarify responsibilities between central and local government in order to implement plans to counter air pollution in large conglomerations and particularly polluted zones; promote the creation of restricted traffic zones and experiments with urban tolls; encourage the replacement of inefficient wood-burning domestic heating systems.
- Improve knowledge of the drivers of air pollution and its impacts on health.

Waste management

- Strengthen awareness of and information on preventing and recycling waste; develop indicators of material and waste flows and encourage businesses to use them in order to track progress in implementing the circular economy strategy and resource programming plan.

Notes

1. In 2013, unemployment (70%), crime (35%), the level of taxes (33%) and social inequalities (31%) were cited among the three main concern of French citizens, ahead of the environment (30%).
2. In order to meet the requirements of the Directive on energy end-use efficiency and energy services (2006/32/CE).
3. Repeals the directive (2006/32/CE).
4. Wastes resulting from the extraction and processing of raw materials, the consumption of finished products, and cleaning operations.
5. Wastes resulting from waste treatment operations (e.g. residues from incineration or composting).
6. Household graphic paper; clothing, household linen, footwear; potentially infectious needles used in medical self-treatment; household furnishings; professional furnishings; chemical products and specific diffuse wastes; gas bottles.
7. For mobile homes.
8. The river basin committees define the *Schémas Directeurs d'Aménagement et de Gestion des Eaux* (SDAGE), planning documents establishing the quantity and quality objectives the reach in each river basin, as well as the measures to be taken to ensure sustainable management of water resources.

References

ADEME (2015), *Agriculture et pollution de l'air, Paris*, *www.ademe.fr/sites/default/files/assets/documents/agriculture-et-pollution-air-primequal-vf.pdf*.

ADEME (2013), *Les filières à responsabilité élargie du producteur – Panorama 2013, www.ademe.fr/sites/default/files/assets/documents/8358-rep-responsabilite-elargie-des-producteurs-panorama_2013.pdf*.

EEA (2014), *Tracking progress towards Europe's climate and energy targets for 2020*, Country profile, European Environment Agency, Copenhagen, *www.eea.europa.eu/themes/climate/ghg-country-profiles/climate-and-energy-profiles-2014/climate-and-energy-profile-2014-8*).

IEA (2015), "World energy balances", *IEA World Energy Statistics and Balances* (database), *http://dx.doi.org/10.1787/data-00512-en*.

EC (2015), *April infringements package: Main decisions,* European Commission, Brussels, *http://europa.eu/rapid/press-release_MEMO-15-4871_en.htm*.

CGDD (2015a), "Chiffres et statistiques", *Opinions et pratiques environnementales des Français en 2014*, General Commissariat for Sustainable Development, Ministry of Ecology, Sustainable Development and Energy, Paris, *www.developpement-durable.gouv.fr/IMG/pdf/CS624.pdf*.

CGDD (2015b), *Bilan de la qualité de l'air en France en 2014*, Paris.

CITEPA (2015), "Air pollutants and GHGs", Interprofessional Technical Centre for Studies on Air Pollution, Paris, *www.citepa.org/en/air-and-climate/pollutants-and-ghg*.

Cour des comptes (2015), *La gestion directe des services d'eau et d'assainissement: des progrès à confirmer,* 2015 Annual Public Report, Paris, *www.ccomptes.fr/Publications/Publications/Rapport-public-annuel-2015*.

Cour des comptes (2013), *L'office national de l'eau et des milieux aquatiques (Onema) : une transformation mal préparée, une gestion défaillante*, 2013 Annual Public Report, Paris, *www.ccomptes.fr/Publications/Publications/Rapport-public-annuel-2013*.

Drees (2015), *L'état de santé de la population en France*, Direction de la recherche, des études, de l'évaluation et des statistiques, Ministry for Social Affairs, Health and Women's Rights, Paris, *www.drees.sante.gouv.fr/l-etat-de-sante-de-la-population-en-france-edition-2015,11406.html#rapport*.

Driee (2015), *L'état de santé de la population en France*, Direction régionale et interdépartementale de l'environnement et de l'énergie d'Île-de-France, Paris, *www.drees.sante.gouv.fr/l-etat-de-sante-de-la-population-en-france-edition-2015,11406.html#rapport*.

Ecologic Institute and Eclareon (2014), *Assessment of climate change policies in the context of the European Semester, Country report: France,* Berlin, *www.ecologic.eu/sites/files/publication/2014/countryreport_fr_ecologiceclareon_jan2014_0.pdf*.

Eurostat (2015a), *Transport – Passenger cars, by age* (database), *http://ec.europa.eu/eurostat/data/database*.

Eurostat (2015b), *Material flows and resource productivity* (database), *http://ec.europa.eu/eurostat/data/database*.

Eurostat (2014), *Pesticide sales* (database), *http://ec.europa.eu/eurostat/data/database*.

FAO (2014), *FAOSTAT Database*, Food and Agriculture Organization of the United Nations, Rome, *http://faostat3.fao.org/home/E*.

IGN (2014), *La forêt en chiffres et en cartes – Édition 2014*, Institut national de l'information géographique et forestière, Saint-Mandé, *www.ign.fr/institut/autres-publications/foret-en-chiffres-en-cartes*.

INPN (2015), "Inventaire national du patrimoine naturel", website (accessed 15 April 2015), *https://inpn.mnhn.fr/programme/les-programmes?lg=en*.

Insee (2015), "Comptes nationaux", National Institute of Statistics and Economic Studies (website), *www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=3.1&xml=t_3106*.

Insee (2013), "Enquête Emploi 2013", (website), *www.insee.fr/fr/themes/tableau.asp?reg_id=0&ref_id=NATCCF03172*.

Levraut A. et al. (2013), *Evaluation de la politique de l'eau*, Ministry of the Environment, Energy and Marine Affairs, Paris, *www.ladocumentationfrancaise.fr/var/storage/rapports-publics/134000639.pdf*.

MAAF (2014), *Pesticides et agro-écologie: les champs du possible*, Ministry of Agriculture, Agrifood and Forestry, Paris, *http://agriculture.gouv.fr/ministere/pesticides-et-agro-ecologie-les-champs-du-possible*.

MEDDE (2015a), *Chiffres clés de l'énergie,* "Édition 2015", Ministry of Ecology, Sustainable Development and Energy, Paris, *www.developpement-durable.gouv.fr/Chiffres-cles-de-l-energie-Edition,42287.html*.

MEDDE (2015b), "Les comptes des transports en 2014", Ministry of Ecology, Sustainable Development and Energy, Paris, *www.statistiques.developpement-durable.gouv.fr/fileadmin/documents/Produits_editoriaux/Publications/Reperes/2015/reperes-chiffres-cles-energie-renouv-2015.pdf*.

MEDDE (2014a), "Plan national d'action efficacité énergétique 2014", Ministry of Ecology, Sustainable Development and Energy, Paris, *https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_fr_france.pdf*.

MEDDE (2014b), *Stratégie nationale de création et de gestion des aires marines protégées*, Ministry of Ecology, Sustainable Development and Energy, Paris, *www.developpement-durable.gouv.fr/IMG/pdf/13148-1_brochure-resume-strategie-aires-marines.pdf*.

MEDDE (2014c), "5ème rapport national de la France à la convention sur la diversité biologique", Ministry of Ecology, Sustainable Development and Energy, Paris, *www.cbd.int/doc/world/fr/fr-nr-05-fr.pdf*.

MEDDE (2014d), "Programme national de prévention des déchets 2014-2020", *www.developpement-durable.gouv.fr/IMG/pdf/Programme_national_prevention_dechets_2014-2020.pdf*.

MEDDE (2011), "Étalement urbain et artificialisation des sols en France", Ministry of Ecology, Sustainable Development and Energy, (website), *www.developpement-durable.gouv.fr/Etalement-urbain-et.html*.

MNHN (2014), "La Liste rouge des espèces menacées en France", National Museum of Natural History, Paris, *http://inpn.mnhn.fr/docs/LR_FCE/Resultats-synthetiques-Liste-rouge-France.pdf*.

OECD (2015a), *OECD Economic Surveys: France 2015*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-fra-2015-en*.

OECD (2015b), *OECD Economic Outlook*, Vol. 2015/2, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_outlook-v2015-2-en*.

OECD (2015c), "Aggregate National Accounts, SNA 2008: Gross domestic product", *OECD National Accounts Statistics* (database), *http://dx.doi.org/10.1787/data-00001-en*.

OECD (2015d), "Large regions, TL2: Regional accounts", *OECD Regional Statistics* (database), *http://dx.doi.org/10.1787/data-00522-en*.

OECD (2015e), "Large regions, TL2: Demographic statistics", *OECD Regional Statistics* (database), *http://dx.doi.org/10.1787/data-00520-en*.

OECD (2015f), "Better Life Index 2015", *OECD Social and Welfare Statistics* (database), *http://dx.doi.org/10.1787/data-00823-en* (accessed 10 September 2015).

OECD (2015g), "Municipal waste", *OECD Environment Statistics* (database), *http://dx.doi.org/10.1787/data-00601-en*.

OECD (2015h), "Water: Wastewater treatment", *OECD Environment Statistics* (database), *http://dx.doi.org/10.1787/data-00604-en*.

OECD (2011), *Water Governance in OECD Countries: A Multi-level Approach, OECD Studies on Water*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264119284-en*.

WHO/Europe, OECD (2015), *Economic cost of the health impact of air pollution in Europe: Clean air, health and wealth,* World Health Organization - Regional Office for Europe, Copenhagen, *www.social-sante.gouv.fr/IMG/pdf/Economic-cost-health-impact-air-pollution-en.pdf*.

ONEMA (2012), *Évolution observées dans les débits de rivières en France,* Office national de l'eau et des milieux aquatiques, Vincennes, *www.onema.fr/IMG/pdf/debits-des-rivieres.pdf*.

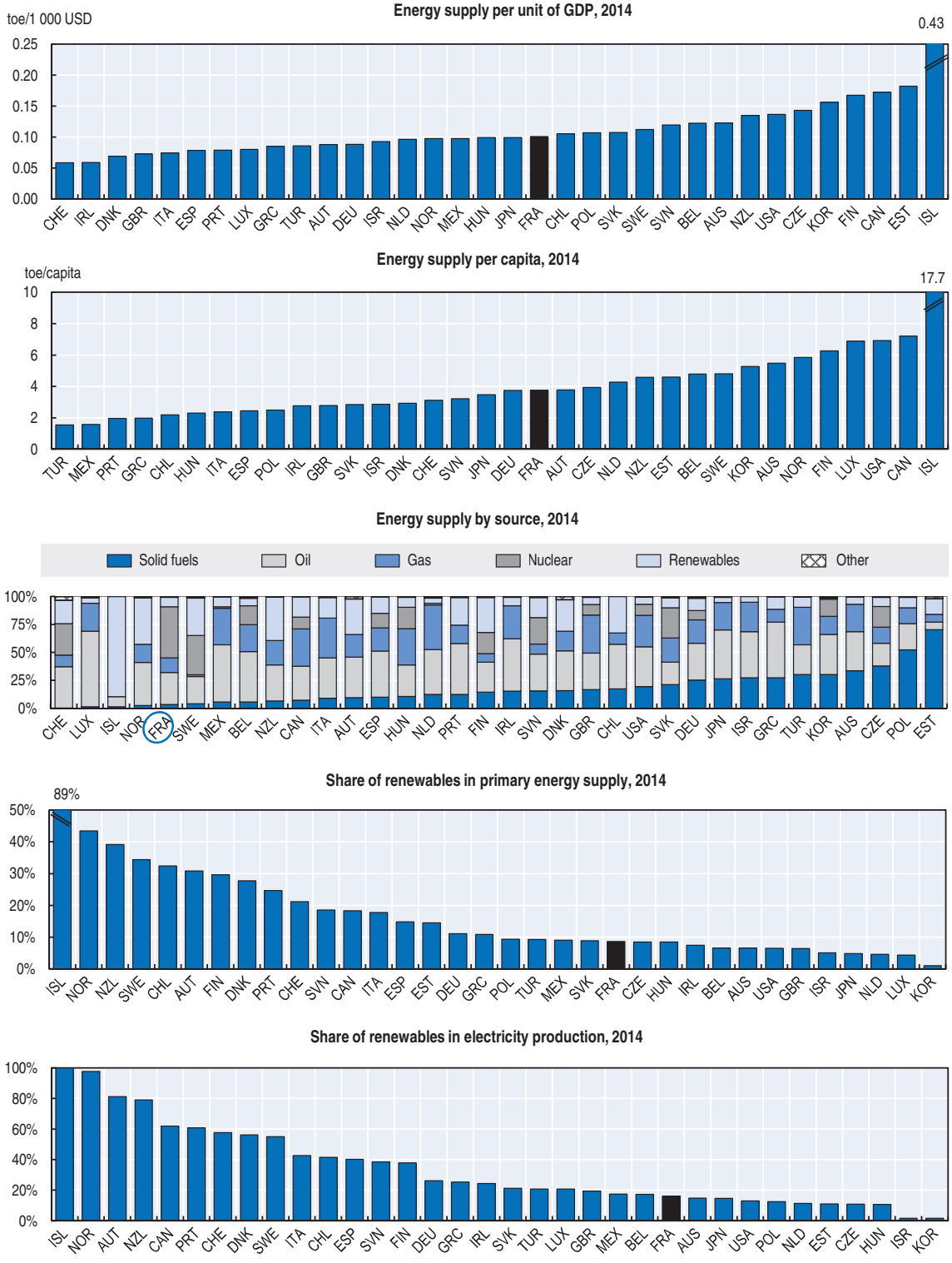
ONEMA (2015), *Panorama des services et de leur performance en 2012*, National Observatory on Public Water and Sanitation Services, Paris, *www.services.eaufrance.fr/docs/synthese/rapports/Rapport_SISPEA_2012_complet_DEF.pdf*.

SOeS (2014), *L'environnement en France*, "Edition 2014", Service de l'observation et des statistiques, Ministry of Ecology, Sustainable Development and Energy, Paris, *www.statistiques.developpement-durable.gouv.fr/publications/p/2101/1097/lenvironnement-france-edition-2014.html*.

ANNEX 1.A

Energy and transport data

Figure 1.A1. **Energy structure and intensity**

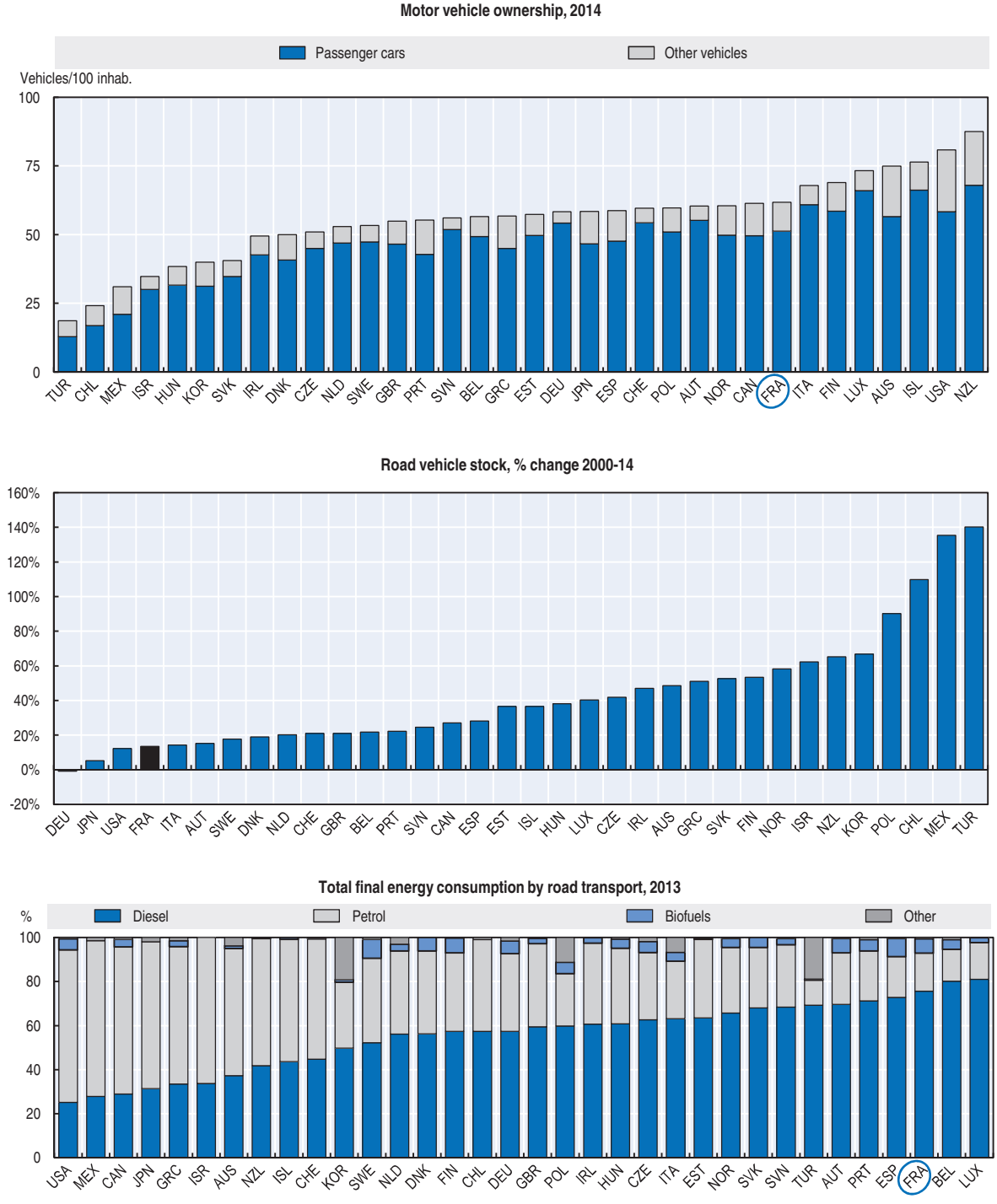


Notes: Data may include provisional figures and estimates. Total primary energy supply; the breakdown excludes electricity trade. GDP at 2010 prices and purchasing power parities.

Source: IEA (2015), *IEA World Energy Statistics and Balances* (database); OECD (2015), "Population projections, Historical population data and projections", *OECD Employment and Labour Market Statistics* (database); OECD (2015), *National Accounts Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406318

Figure 1.A2. **Road transport**



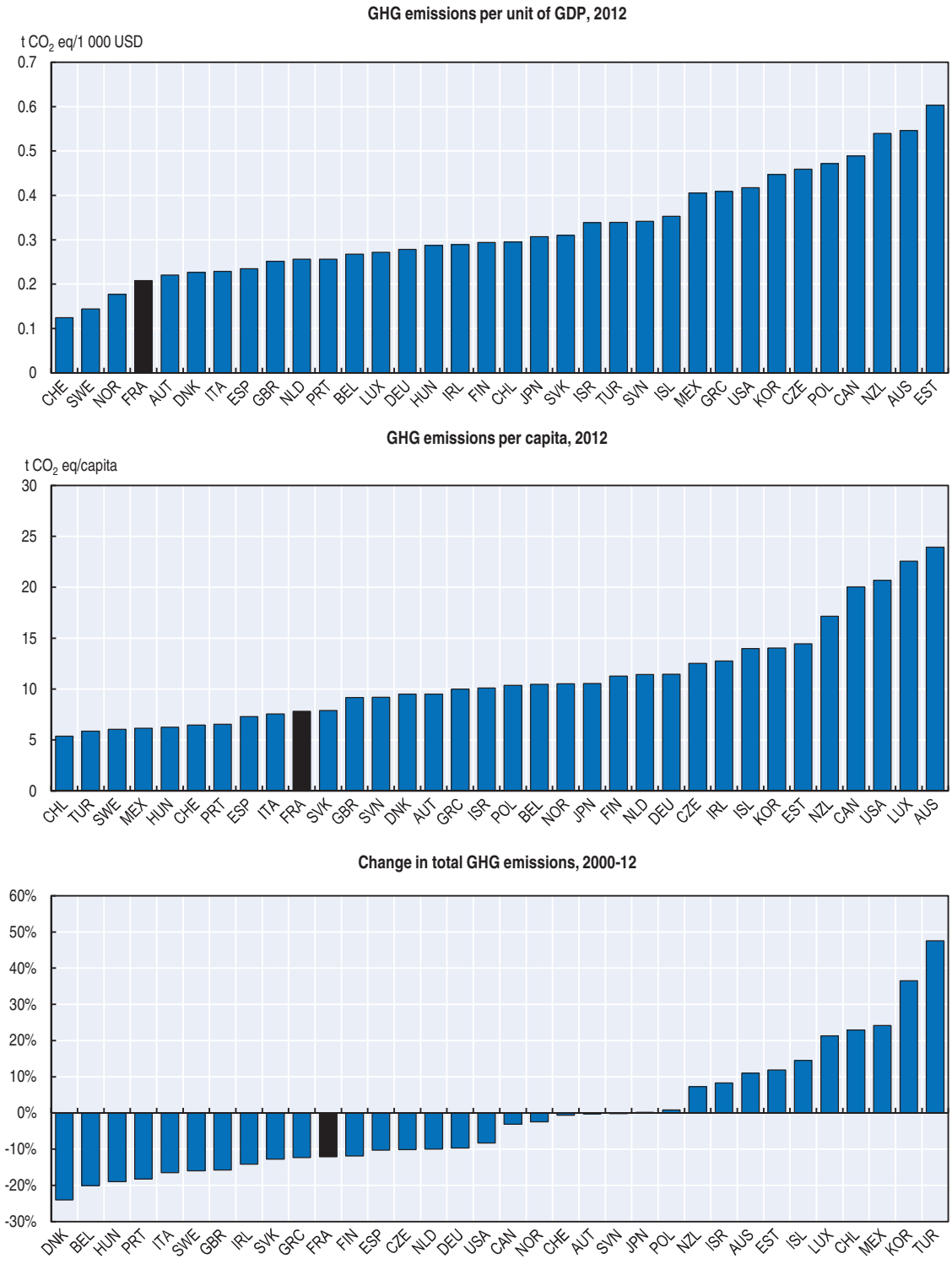
Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates. Motor vehicles with four or more wheels.
Source: Eurostat (2015), *Transport Statistics* (database); IEA (2015), *IEA World Energy Statistics and Balances* (database); North American Transportation Statistics (NATS) (2015), *Statistics Online Database*; UNECE (2015), "Transport", *UNECE Statistical Database*; national sources.

StatLink http://dx.doi.org/10.1787/888933406322

ANNEX 1.B

Climate change and atmospheric pollution data

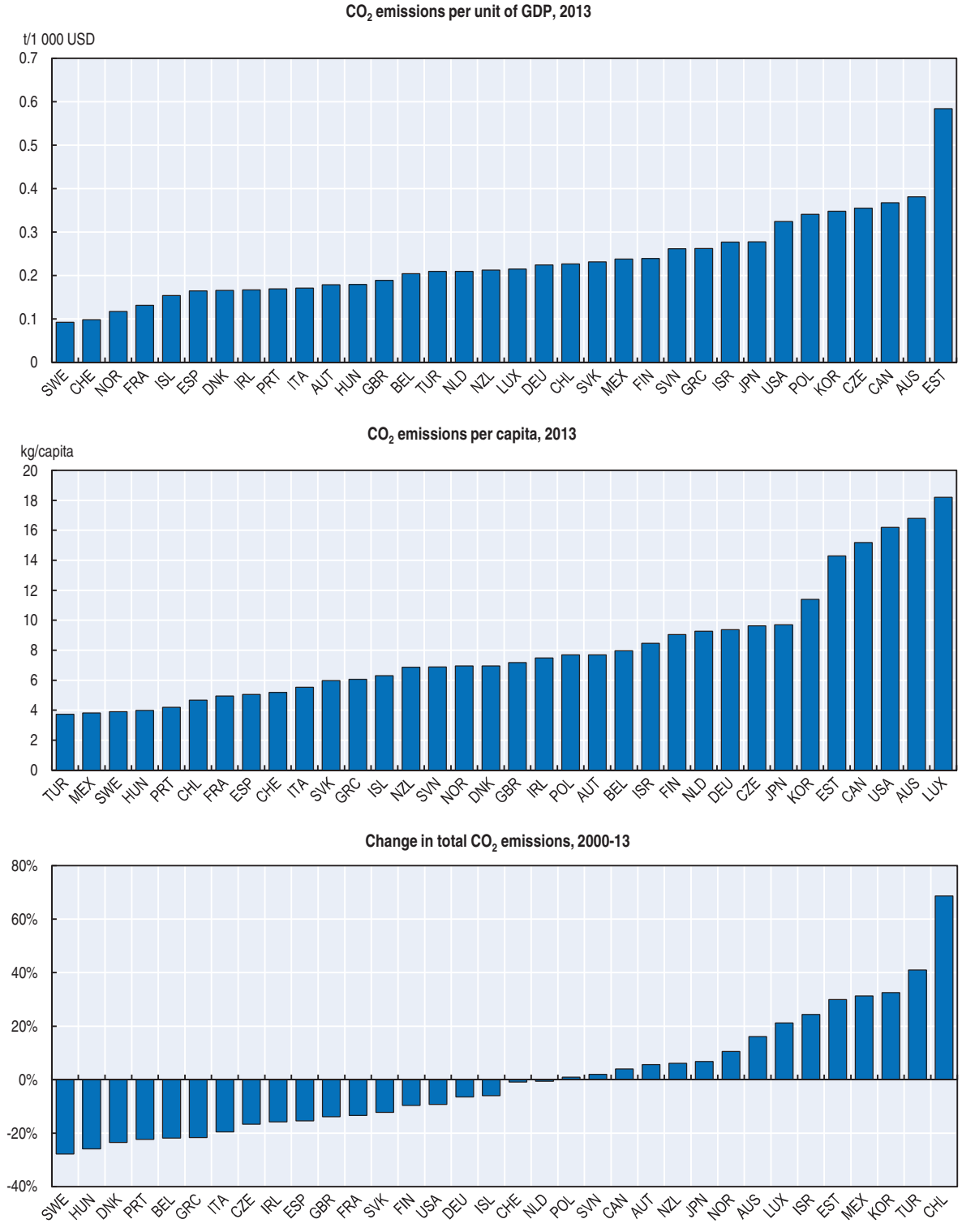
Figure 1.B1. **GHG emissions and intensities**



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
GHG emissions excluding emissions/removals from land use, land-use change and forestry. CHL: data refer to 2010. ISR : 2000 data exclude F-gases.
GDP at 2010 prices and purchasing power parities.
Source: OECD (2015), "Greenhouse gas emissions by source", *OECD Environment Statistics* (database); OECD (2015), "Labour Force Statistics: Population projections", *OECD Employment and Labour Market Statistics* (database); OECD (2015), *OECD National Accounts Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406339

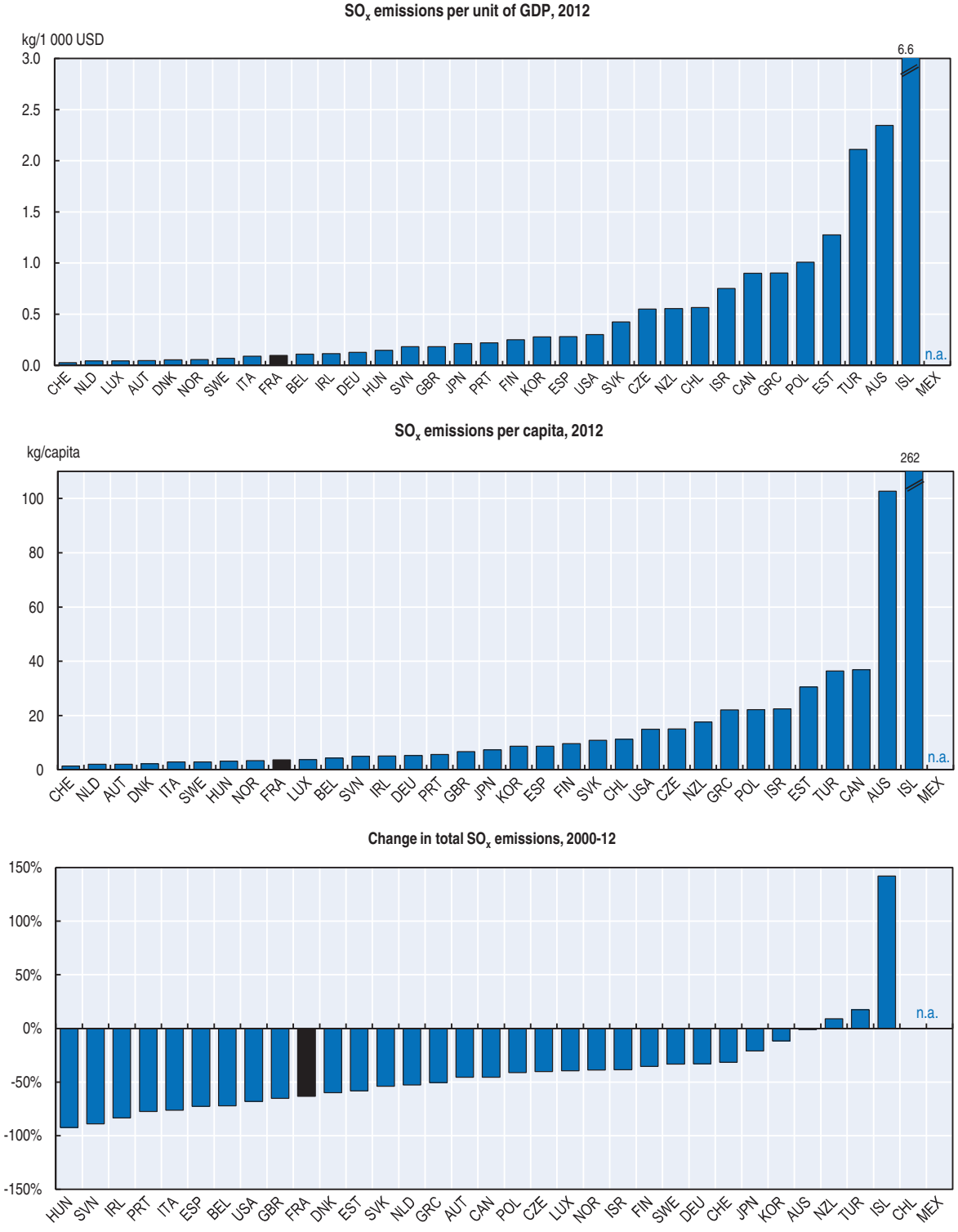
Figure 1.B2. CO_2 emissions and intensities



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
CO_2 emissions from energy use only; excluding international marine and aviation bunkers; sectoral approach. GDP at 2010 prices and purchasing power parities.
Source: IEA (2014), *IEA CO_2 Emissions from Fuel Combustion Statistics* (database); OECD (2015), "Labour Force Statistics: Population projections", *OECD Employment and Labour Market Statistics* (database); OECD (2015), *OECD National Accounts Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406347

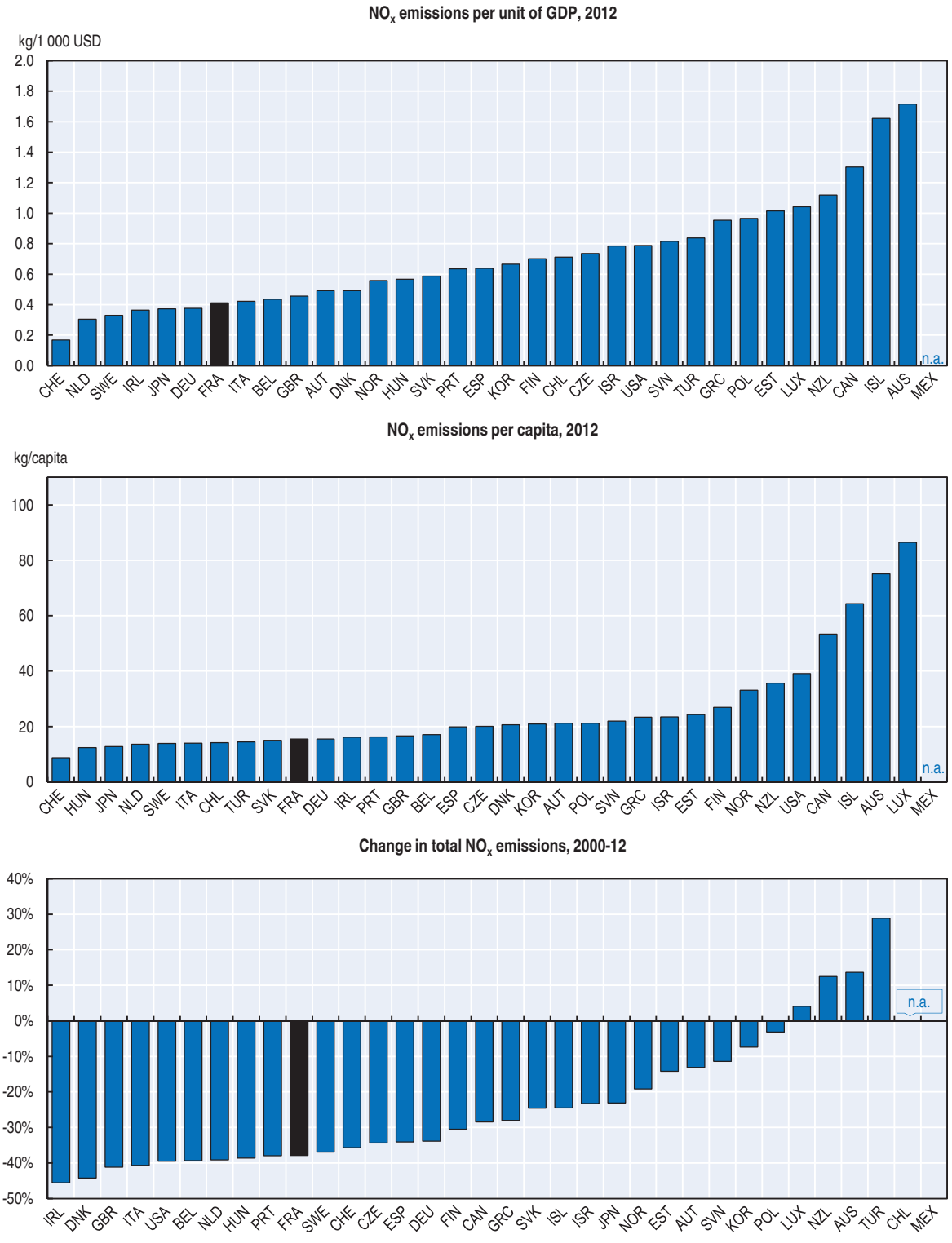
Figure 1.B3. SO_x emissions and intensities



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
GDP at 2010 prices and purchasing power parities. ISL: includes emissions from geothermal energy (80% of total emissions in 2012).
Source: OECD (2015), "Air emissions by source", *OECD Environment Statistics* (database); OECD (2015), "Labour Force Statistics: Population projections", *OECD Employment and Labour Market Statistics* (database); OECD (2015), *National Accounts Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406352

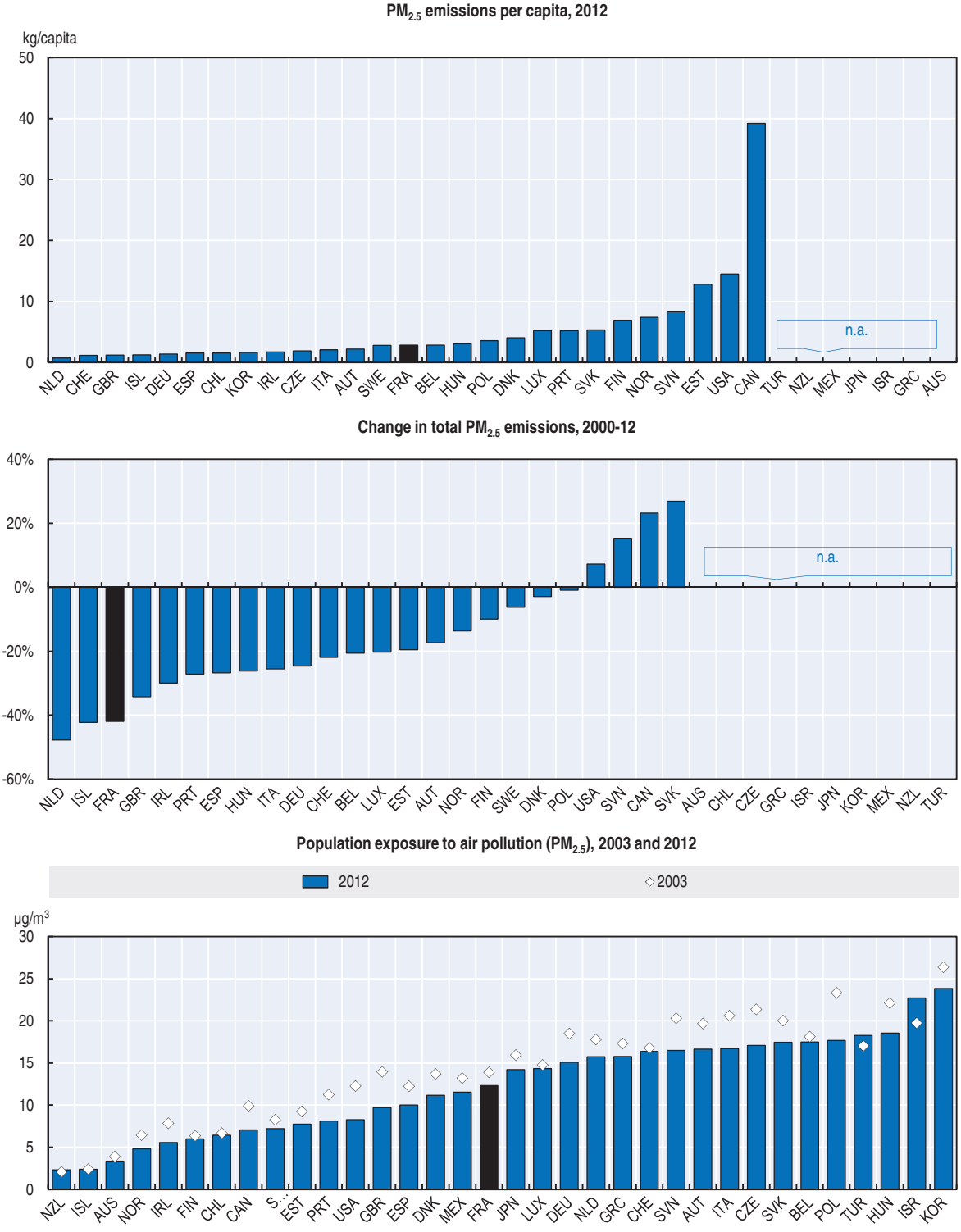
Figure 1.B4. NO_x emissions and intensities



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
GDP at 2010 prices and purchasing power parities. LUX: data exclude emissions from "fuel tourism".
Source: OECD (2015), "Air emissions by source", *OECD Environment Statistics* (database); OECD (2015), "Labour Force Statistics: Population projections", *OECD Employment and Labour Market Statistics* (database); OECD (2015), *National Accounts Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406362

Figure 1.B5. $PM_{2.5}$ emissions and exposure to pollution



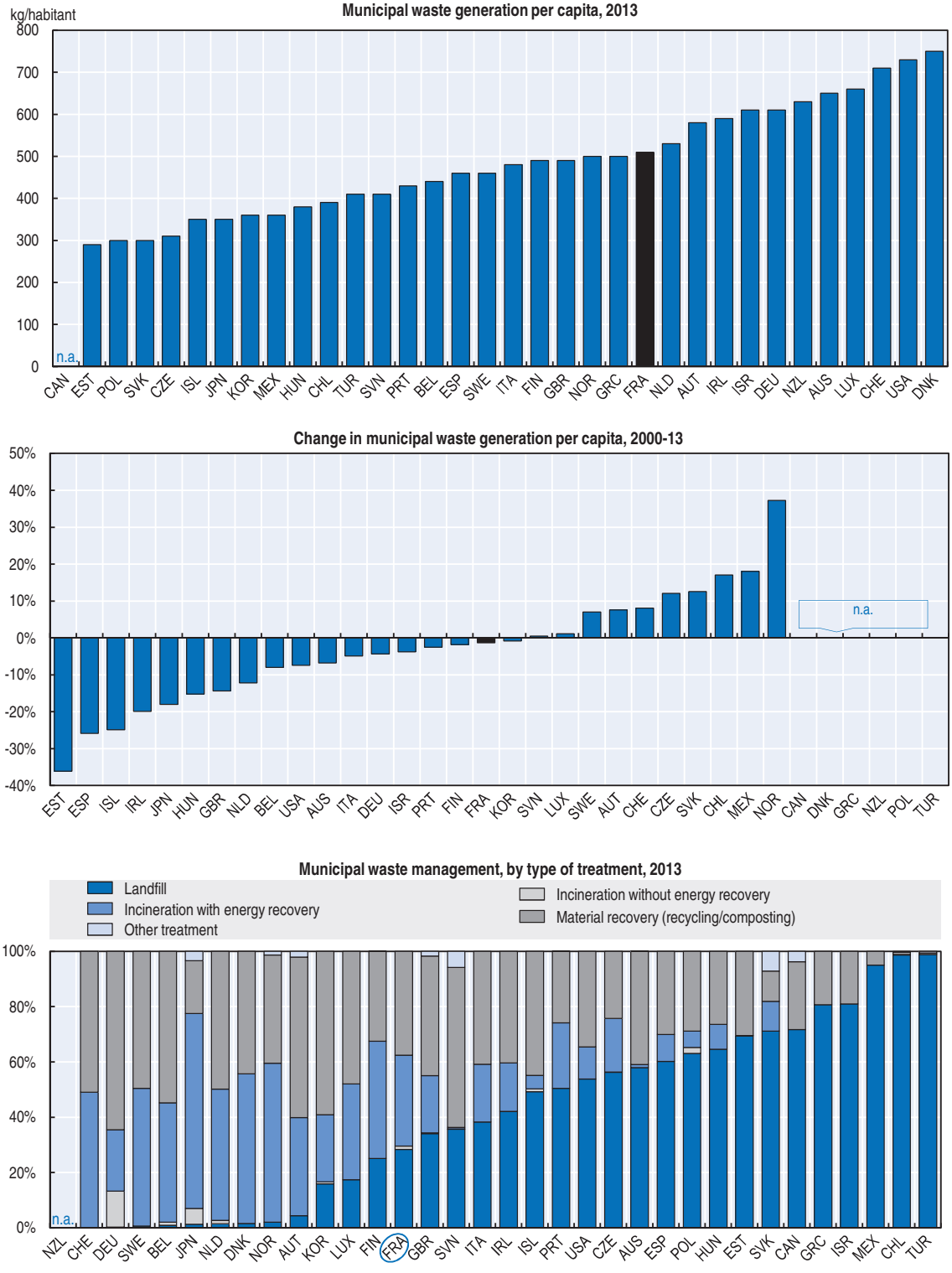
Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
Population exposure to air pollution: estimates based on satellite imagery data; three-year average data.
Source: OECD (2015), "Air emissions by source", *OECD Environment Statistics* (database); OECD (2015), "Labour Force Statistics: Population projections", *OECD Employment and Labour Market Statistics* (database); OECD (2015), *OECD Regional Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406371

ANNEX 1.C

Waste and resource management data

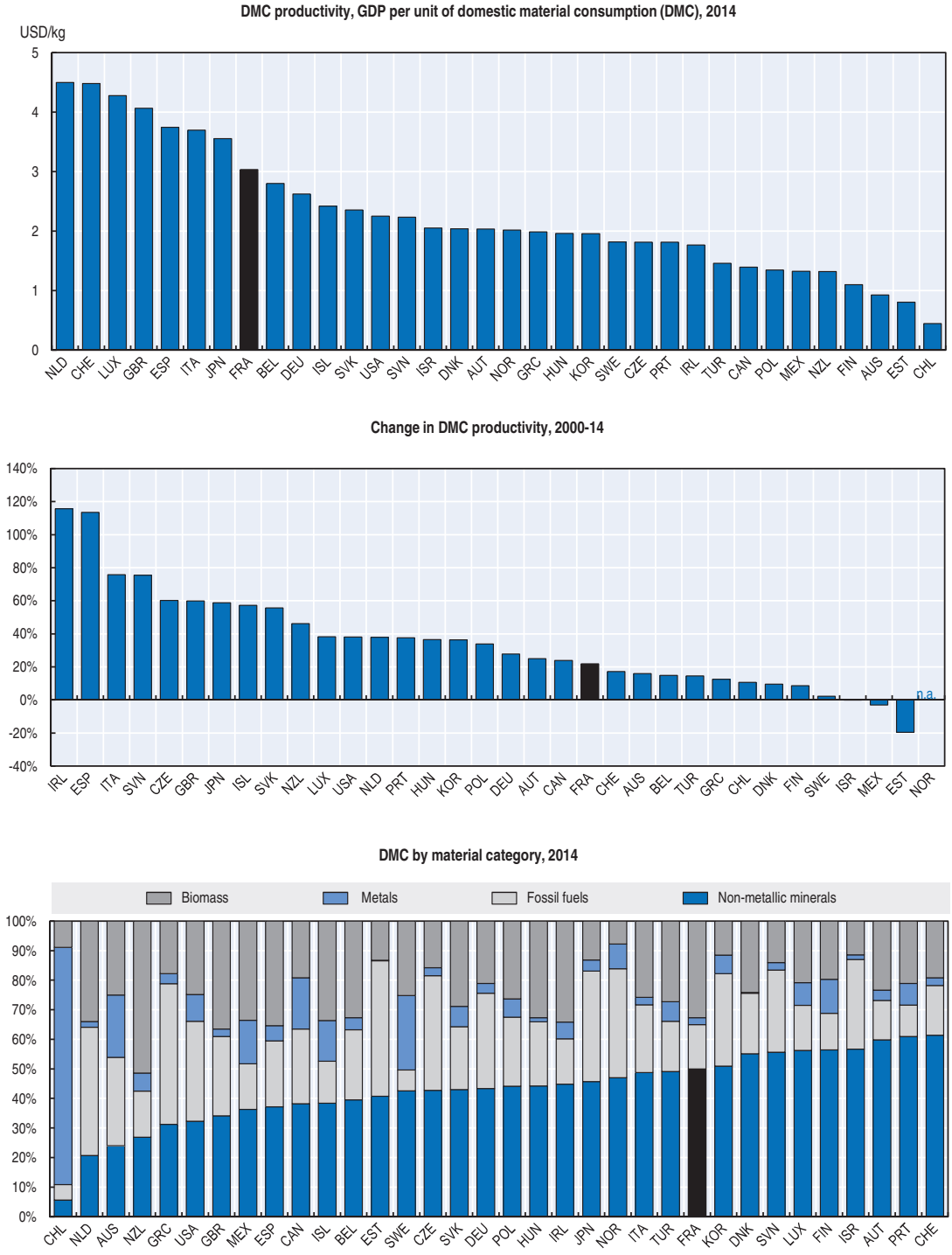
Figure 1.C1. **Waste production and management**



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates. Amounts per capita are rounded.
Waste collected by or for municipalities. It includes household, bulky and commercial waste, and similar waste handled at the same facilities.
CAN: Includes construction and demolition waste.
Source: OECD (2015), "Municipal waste", *OECD Environment Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406387

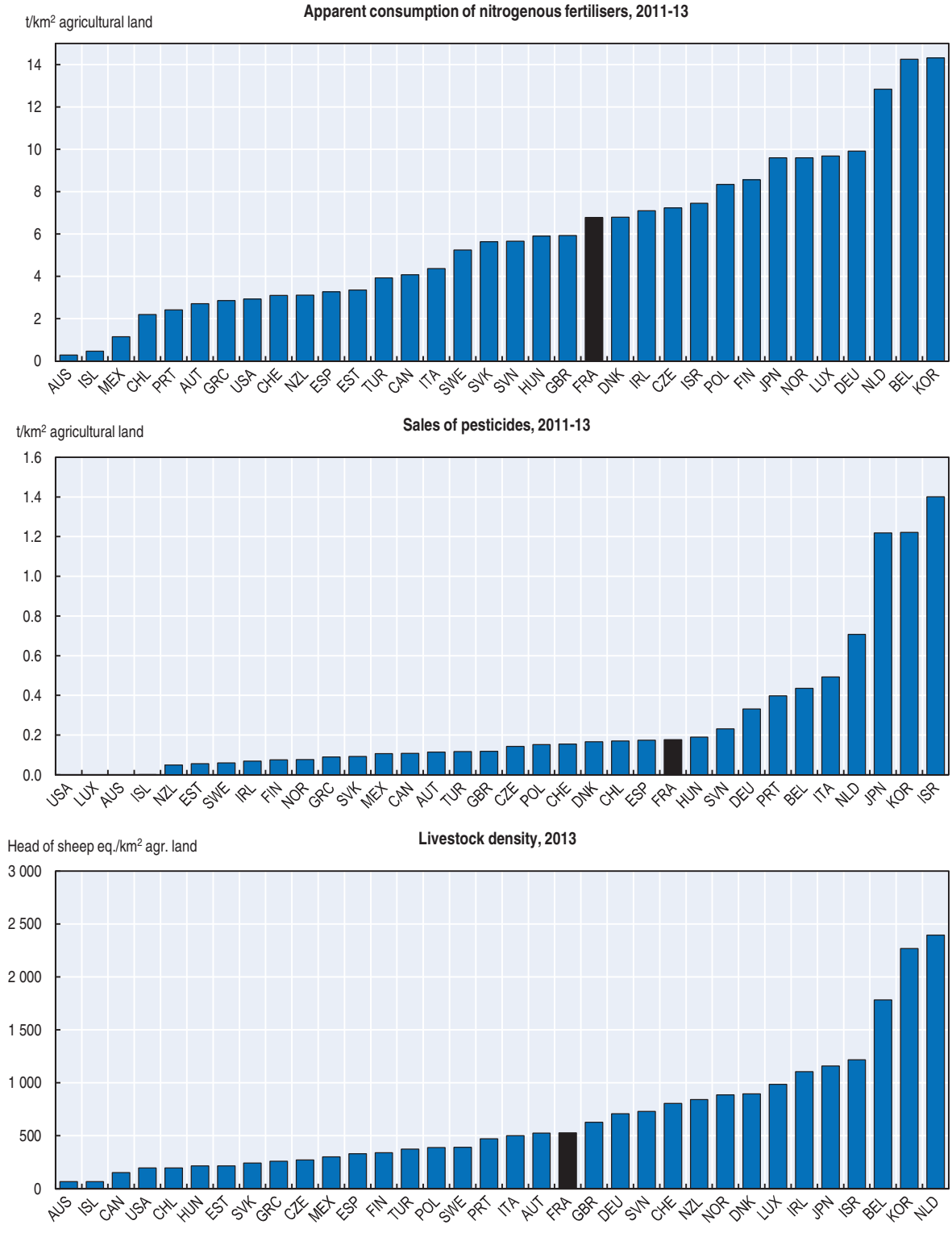
Figure 1.C2. **Material consumption and resource productivity**



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
Domestic material consumption (DMC) equals the sum of domestic extraction of raw materials used by an economy and their physical trade balance (imports minus exports of raw materials and manufactured products). DMC productivity designates the amount of GDP generated per unit of materials used and is calculated as the ratio of GDP to domestic material consumption (DMC). GDP at 2010 prices and purchasing power parities.
Non-metallic minerals: domestic extraction and trade of minerals used in industry and construction, plus trade of derived processed products; fossil energy carriers: coal, crude oil, natural gas, peat and traded-derived products; metals: domestic extraction of metal ores, plus trade of metal ores, metal concentrates, refined metals, products mainly made of metals, and scrap; biomass: domestic production from agriculture, forestry and fisheries, plus trade of raw and processed products from these sectors.
Source: OECD (2015), "Material resources", *OECD Environment Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406395

Figure 1.C3. **Agricultural inputs and livestock density**



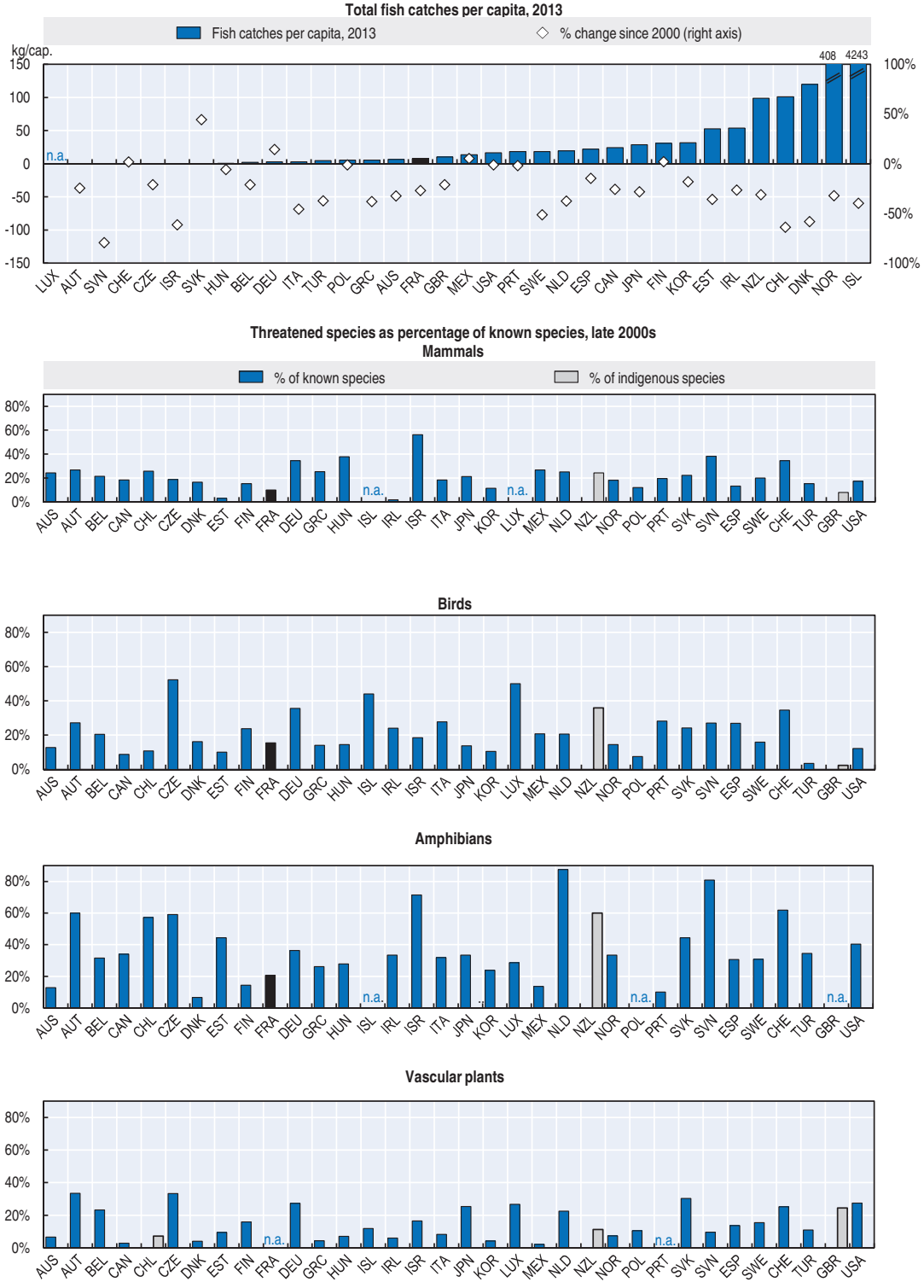
Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
Source: FAO (2015), *FAOSTAT* (database); OECD (2015), "Environmental Performance of Agriculture", *OECD Agriculture Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406403

ANNEX 1.D

Biodiversity and water data

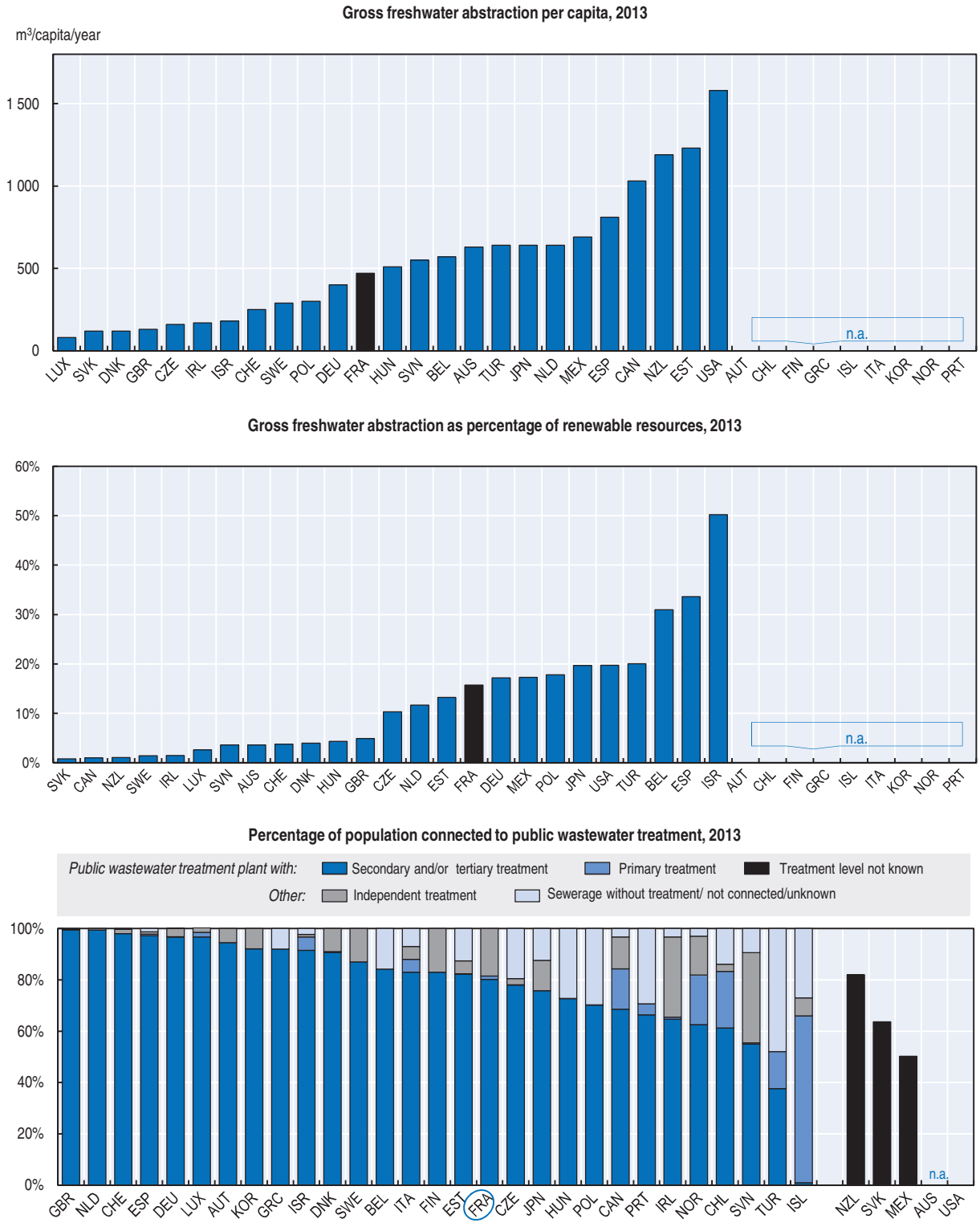
Figure 1.D1. **Fish catches and threatened species**



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates.
Total fish catches: volumes of fish catches in inland waters and marine areas. Excludes marine mammals, crocodiles and alligators, aquatic plants and miscellaneous aquatic products.
Threatened species: IUCN categories critically endangered, endangered and vulnerable in % of known species.
Sources: FAO (2015), *FAOSTAT* (database). OECD (2015), "Threatened species", *OECD Environment Statistics* (database)

StatLink http://dx.doi.org/10.1787/888933406411

Figure 1.D2. **Water abstraction and wastewater treatment**



Notes: Data refer to the indicated year or to the latest available year. They may include provisional figures and estimates. Freshwater abstraction: for some countries, data refer to water permits and not to actual abstractions).
Source: OECD (2015), "Water: Freshwater Abstractions", "Wastewater Treatment", OECD (2015), *OECD Environment Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933406423