Environment at a Glance Indicators

Climate change

Context

Issues at stake

Emissions of greenhouse gases (GHGs) from human activities disturb the radiative energy balance of the earth-atmosphere system. They exacerbate the natural greenhouse effect, leading to temperature changes and other disruption of the earth's climate. Land use changes and forestry also play a role by altering the amount of greenhouse gases captured or released by carbon sinks. **Carbon dioxide** (CO_2) from the combustion of fossil fuels and deforestation is a major contributor to greenhouse gases. CO_2 makes up the largest share of greenhouse gases and thus is a key factor in countries' ability to mitigate climate change. National emissions are also affected by changes in global demand and supply patterns with increasing trade flows and the displacement of carbon-intensive production abroad. Reductions in domestic emissions can thus be partially or wholly offset elsewhere in the world.

Climate change is of global concern for its effects on green growth and sustainable development. It threatens ecosystems and biodiversity, affects water resources, human settlements and the frequency and scale of extreme weather events, with significant consequences for food production, human well-being, socio-economic activities and economic output.

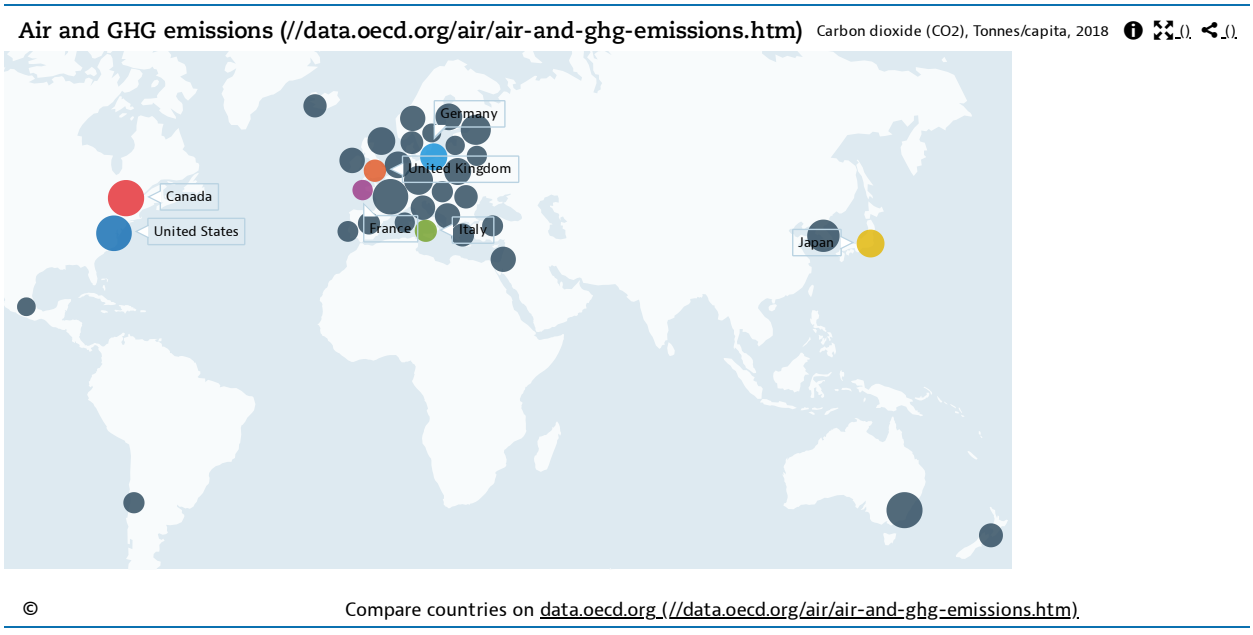
Policy challenges

The main challenges are to **mitigate GHG emissions** and **stabilise GHG concentrations** in the atmosphere at a level that would limit dangerous interference with the climate system, and to adapt to and manage risks from climate change.

- This implies implementing national and international low-carbon strategies and further decoupling GHG emissions from economic growth. It also implies increasing

the share of **renewable energy** sources in the supply mix, and reducing **energy intensity** by adopting energy-efficient production processes and increasing the energy efficiency of consumer goods and services.

- With increasing trade flows, interdependent global value chains and the relocation of carbon-intensive production abroad, reductions in domestic emissions can be partially or wholly offset elsewhere in the world. Domestic mitigation efforts must thus be placed in a global context and must build on a good understanding of carbon flows associated with **international trade and final domestic demand**.
- Ensuring a proper mix of market-based instruments, for example by promoting **carbon pricing**, **environmentally-related taxation** and removing government subsidies and other **support for fossil fuels**, plays an important role in this transition.
- Beyond these steps, governments must **align policies** across a diverse range of non-climate areas including transport, housing, construction, spatial planning, agriculture and development cooperation. And they must consider synergies between emissions reduction, adaptation strategies and broader well-being objectives such as reduced air pollution and improved health.



Measuring progress and performance

Environmental performance can be assessed against domestic objectives and international goals and commitments. Tackling **climate change** and underlying drivers is part of the 2030 Agenda for Sustainable Development (New York, September 2015) under *Goal 13*: "*Take urgent action to combat climate change and its impacts"*; *Goal 12*: "*Ensure sustainable consumption and production patterns"*; *Goal 9*: "*Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"* and *Goal 7*: "*Ensure access to affordable, reliable, sustainable and modern energy for all".*

The main international agreement is the *United Nations Framework Convention on Climate Change* (1992) which is the basis of:

- The *Kyoto Protocol* (1997), setting internationally binding and differentiated **emission reduction** targets for six GHGs **for 2008-12**. It has been ratified by 177 parties, including all but two OECD countries, and has been in force since 2005. 37 industrialised countries and the European Union committed to reduce GHG emissions by an average of 5% below 1990 levels. The "Doha Amendment to the Kyoto Protocol" (2012), includes **new commitments for the period 2013-20** and a revised list of GHGs. Parties committed to reduce GHG emissions by an average of at least 18% below 1990 levels over 2013-20. The amendment is not yet in force.
- The *Paris Agreement* (2015) builds upon the Convention and strengthens the global response to the threat of climate change. The objective is to keep the average global temperature rise this century well below 2 degrees Celsius and as close as possible to 1.5 degrees Celsius above pre-industrial levels. Parties have expressed their commitments to 2025 or 2030 through nationally determined contributions (NDCs), including a regular report on their emissions and implementation efforts.

This is supported by the commitment in September 2009, of the Leaders of the Group of Twenty (G20) economies to "*phase out and rationalize over the medium term inefficient fossil fuel subsidies while providing targeted support for the poorest*." To follow up on this commitment, G20 members have since engaged in a voluntary process of periodically reporting on their fossil-fuel subsidies.

Indicator groups

- Greenhouse gas emissions: levels, intensities, composition by source.
- Production-based and demand-based (carbon footprint) CO_2 emissions from energy use: levels, intensities, productivity.
- Energy use: energy supply, energy mix by source, intensities, share or renewables in electricity production.
- Taxes relevant for climate change: revenue raised and tax base structure.
- Fossil-fuel support: fossil-fuel subsidies and other support measures.

Greenhouse gas emissions

Key messages

- **Global GHG emissions have increased** by 1.5 fold since 1990, driven by economic growth and increasing fossil energy use.
- In almost all **OECD countries** however, **emissions have been declining** in recent years partly due to the economic slowdown following the 2008 financial crisis, but also to strengthened climate policies.
- The rate of progress in reducing emissions varies significantly across individual OECD countries. **Progress** overall **is insufficient** and **GHG emissions are expected to rise again** due to recent increase of energy use and CO_2-related emissions.

Main trends and recent developments

Despite some progress achieved in decoupling GHG emissions from GDP growth, emissions are still growing in many countries. **Global GHG emissions have increased** by 1.5 fold since 1990, driven by economic growth and increasing fossil energy use in developing countries. Historically, OECD countries emitted the bulk of global GHGs, but the share of BRIICS countries in global emissions has been increasing to over 40% since 2010. CO_2 determines the overall trend. Together with CH_4 and N_2O, it accounts for about 98% of GHG emissions (IEA, 2019).

Emissions of OECD countries peaked in 2007, have fallen over the past 10 years (-9%) and now seem to be stabilising. Emissions have been declining in almost all OECD countries, partly due to a slowdown in economic activity following the 2008 economic crisis, but also to strengthened climate policies and changing patterns of energy consumption**. Emission intensities** per unit of GDP and per capita decreased since 2005 in almost all OECD countries, revealing a strong overall decoupling from economic growth. Under the Kyoto Protocol, most OECD countries met their emission **reduction commitments** for the first period 2008-12 and are on track to meet their 2020 target.

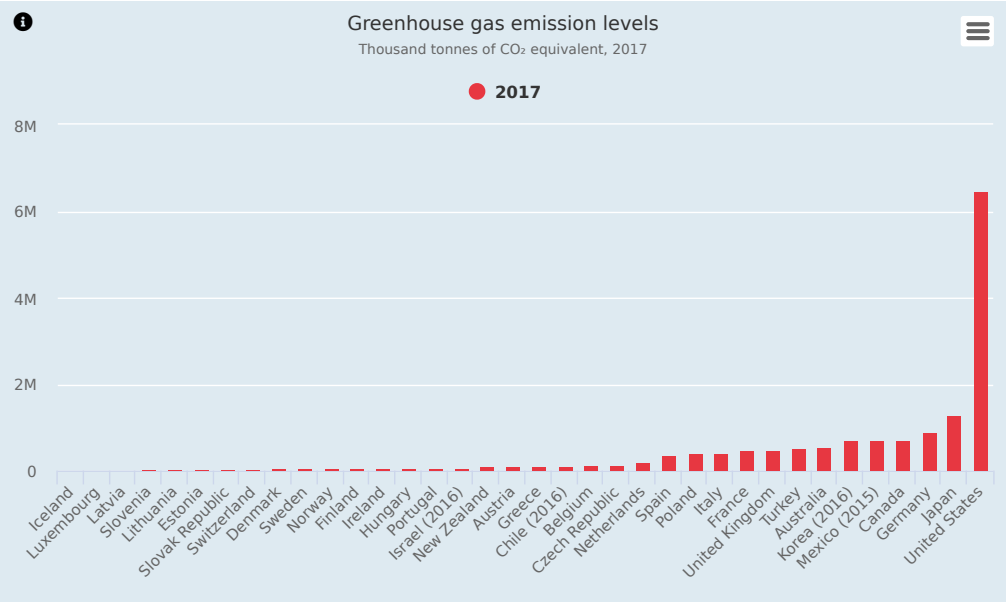
Overall **progress is** however **insufficient**. GHG emissions are expected to rise again due to recent increase of energy use and CO_2-related emissions. Climate change is increasingly impacting people’s lives, national economies, biodiversity and ecosystems, including the ocean.

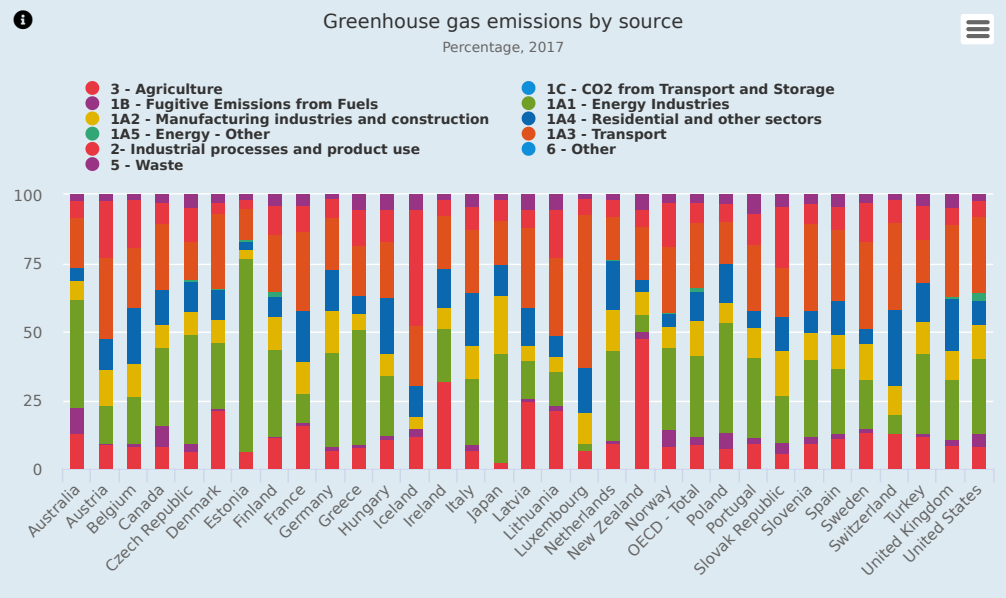
On average, **energy industries** generate 29% of GHG emissions in OECD countries, followed by **transport** (24%), **manufacturing industries** (13%), **agriculture**, (9%), **industrial processes** (7%) and **waste** (3%). While the share of emissions from energy industries have decreased since 2005, those from transport and agriculture increased. In

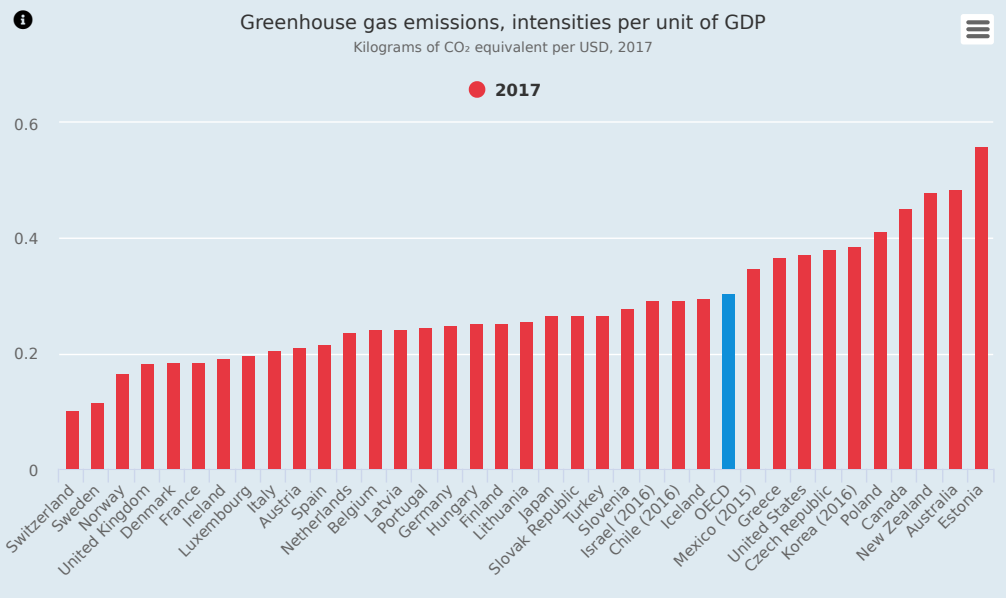
some countries such as Luxembourg, Slovenia, Sweden and Switzerland, emissions from transport account for more than 30% of total emissions, while in New Zealand and Ireland, agriculture is the first GHG emitter (above 30%).

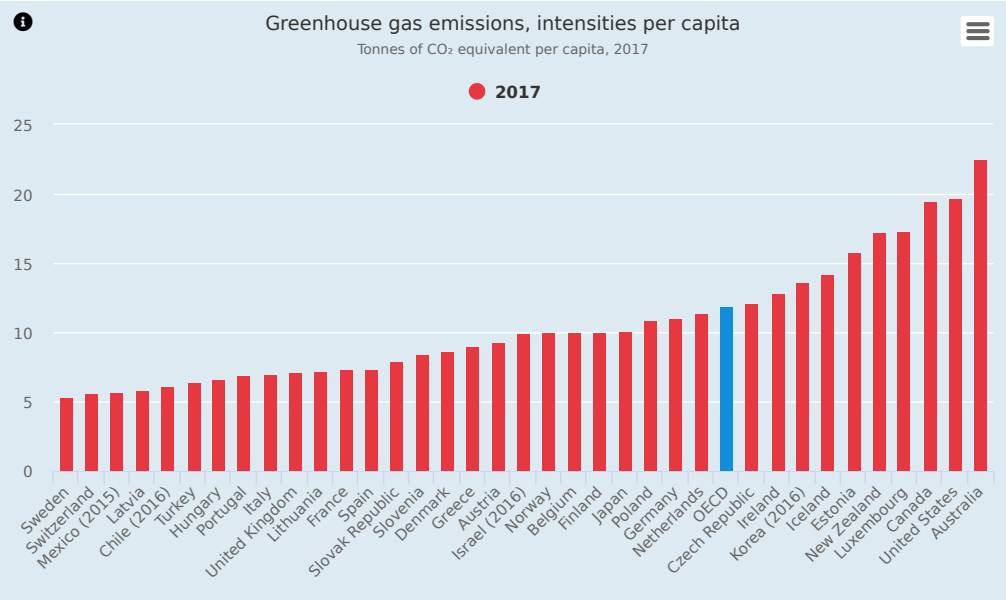
Individual OECD countries' rates of progress vary significantly, whether emissions are considered in absolute numbers, per capita amounts or per unit of GDP. This partly reflects different national circumstances, such as composition and rate of economic growth, socio-demographic developments, energy supply and consumption patterns, energy prices, and the extent to which the countries have taken steps to reduce emissions from various sources and to price carbon.

Indicators




Greenhouse gas emissions by source
Percentage, 2017
3 - Agriculture
1B - Fugitive Emissions from Fuels
1A2 - Manufacturing industries and construction
1A5 - Energy - Other
2- Industrial processes and product use
5 - Waste
1C - CO2 from Transport and Storage
1A1 - Energy Industries
1A4 - Residential and other sectors
1A3 - Transport
6 - Other
100
75
50
25
0
Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Japan
Latvia
Lithuania
Luxembourg
Netherlands
New Zealand
Norway
OECD - Total
Poland
Portugal
Slovak Republic
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States


Greenhouse gas emissions, intensities per unit of GDP
Kilograms of CO₂ equivalent per USD, 2017
2017
0.6
0.4
0.2
0
Switzerland
Sweden
Norway
United Kingdom
Denmark
France
Ireland
Luxembourg
Italy
Austria
Spain
Netherlands
Belgium
Latvia
Portugal
Germany
Hungary
Finland
Lithuania
Japan
Slovak Republic
Turkey
Slovenia
Israel (2016)
Chile (2016)
Iceland
OECD
Mexico (2015)
Greece
United States
Czech Republic
Korea (2016)
Poland
Canada
New Zealand
Australia
Estonia



Comparability and interpretation

Data on GHG emissions display a good level of comparability. The high per-GDP emissions of Estonia result from the use of oil shale for electricity generation (oil shale has a high carbon emission factor). The high per-capita emissions of Luxembourg result from a high number of cross-border workers and the lower taxation of road fuels compared to neighbouring countries, which attracts drivers to refuel in the country.

Reductions in national emissions may also be the result of offshoring domestic production (and the associated emissions). Evidence of decoupling based on domestic emissions per unit of GDP or per capita, therefore, may reveal only part of the story.

For further details, see the metadata in the source databases listed under *Sources* below.

CO_2 emissions from energy use

Key messages

- Despite a slowdown in the OECD area, **global CO_2 emissions continued to grow**. Very few countries have managed to reduce emission levels in absolute terms.
- Today, **OECD countries emit about 35% of global CO_2 emissions** from energy use, compared to more than 50% in 1990.
- A more nuanced picture emerges when emissions are considered from the perspective of final demand. The carbon footprint of OECD countries is generally higher than emissions from domestic production.

Main trends and recent developments

CO_2 from the combustion of fossil fuels and biomass accounts for about 90% of total CO_2 emissions and two third of total GHG emissions, therefore determining overall GHG emissions trend. After three years of stability, global energy-related CO_2 emissions picked-up again and reached a record high of 32.8 billion tonnes in 2017. Emissions are still growing in many countries mainly due to increases in the transport and the energy sectors.

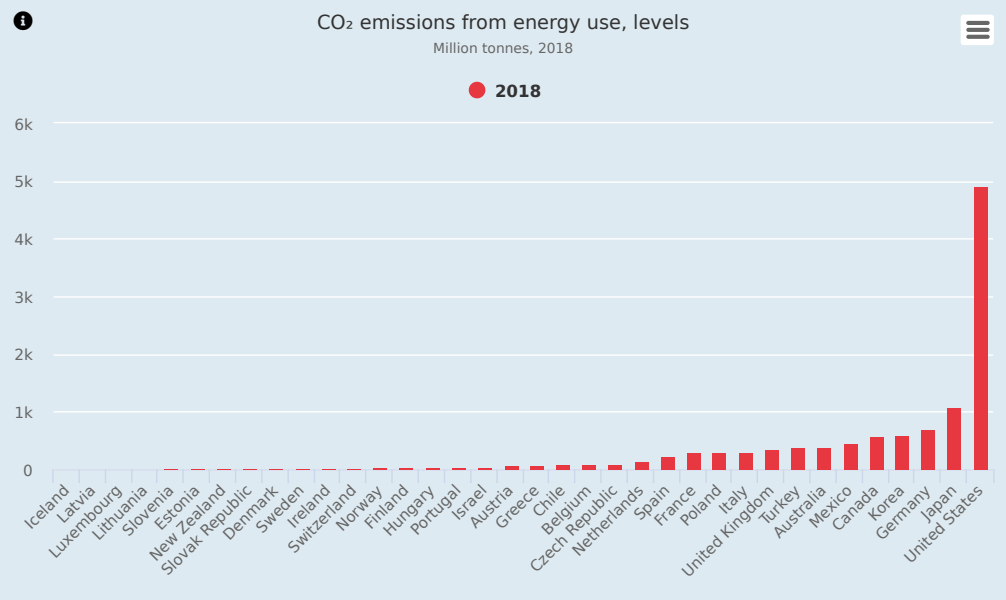
Since 2000, OECD **energy-related CO_2 emissions** have decreased while **economic growth** has been positive. This is due to structural changes in industry and energy supply and improvements in energy efficiency in production processes. Most countries have achieved only a relative decoupling between emissions and economic growth, although some managed to reduce emission levels in absolute terms. While decreasing in OECD America and OECD Europe, energy-related CO_2 emissions continue to grow in the OECD Asia-Oceania region. This is due to energy supply and consumption patterns and trends, often combined with relatively low energy prices.

Since 1990, energy-related CO_2 emissions have grown more slowly in OECD countries as a group than they have worldwide. Today, OECD countries emit about 35% of global CO_2 emissions from energy use, compared to more than 50% in 1990.

On a per-capita basis, OECD countries still emit far more CO_2 than most other world regions, with 8.7 tonnes of CO_2 emitted per capita on average in OECD countries in 2018, compared to 4.3 tonnes in the rest of the world. Individual OECD countries' rates of progress vary significantly, regardless of whether they are considered in absolute numbers, per capita amounts or per unit of GDP.

A more nuanced picture emerges when emissions are considered from the perspective of final demand. The **carbon footprint** of OECD countries, that accounts for all carbon emitted anywhere in the world to satisfy domestic final demand is generally higher than emissions from domestic production. This is because OECD countries have increasingly outsourced the production of consumer goods to other countries.

Indicators


CO₂ emissions from energy use, levels
Million tonnes, 2018
2018
6k
5k
4k
3k
2k
1k
0
Iceland
Latvia
Luxembourg
Lithuania
Slovenia
Estonia
New Zealand
Slovak Republic
Denmark
Sweden
Ireland
Switzerland
Norway
Finland
Hungary
Portugal
Israel
Austria
Greece
Chile
Belgium
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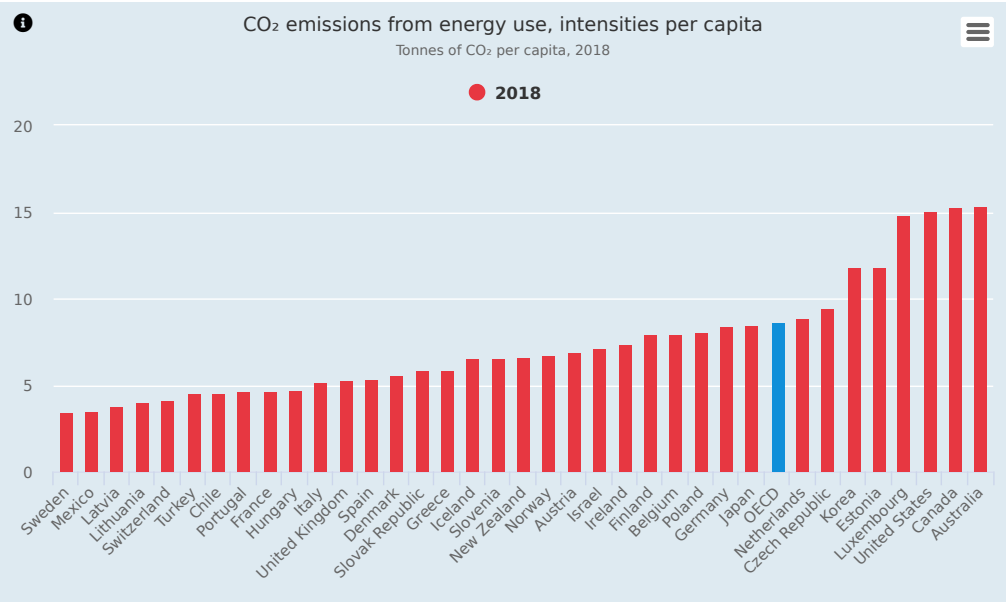
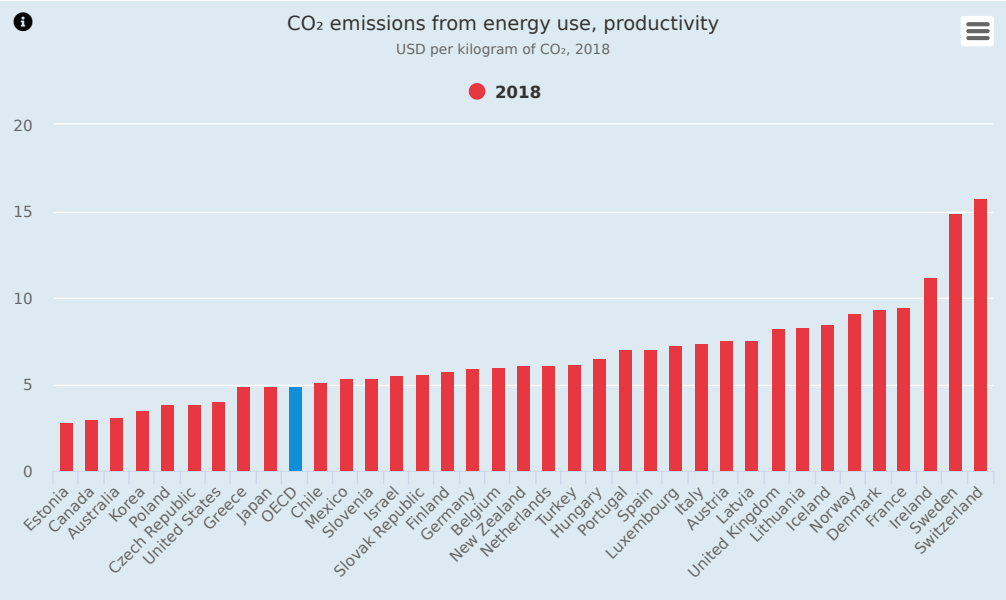
Netherlands
Spain
France
Poland
Italy
United Kingdom
Turkey
Australia
Mexico
Canada
Korea
Germany
Japan
United States


CO₂ emissions from energy use, intensities per capita
Tonnes of CO₂ per capita, 2018
2018
20
15
10
5
0
Sweden
Mexico
Latvia
Lithuania
Switzerland
Turkey
Chile
Portugal
France
Hungary
Italy
United Kingdom
Spain
Denmark
Slovak Republic
Greece
Iceland
Slovenia
New Zealand
Norway
Austria
Israel
Ireland
Finland
Belgium
Poland
Germany
Japan
OECD
Netherlands
Czech Republic
Korea
Estonia
Luxembourg
United States
Canada
Australia


CO₂ emissions from energy use, productivity
USD per kilogram of CO₂, 2018
2018
20
15
10
5
0
Estonia
Canada
Australia
Korea
Poland
Czech Republic
United States
Greece
Japan
OECD
Chile
Mexico
Slovenia
Israel
Slovak Republic
Finland
Germany
Belgium
New Zealand
Netherlands
Turkey
Hungary
Portugal
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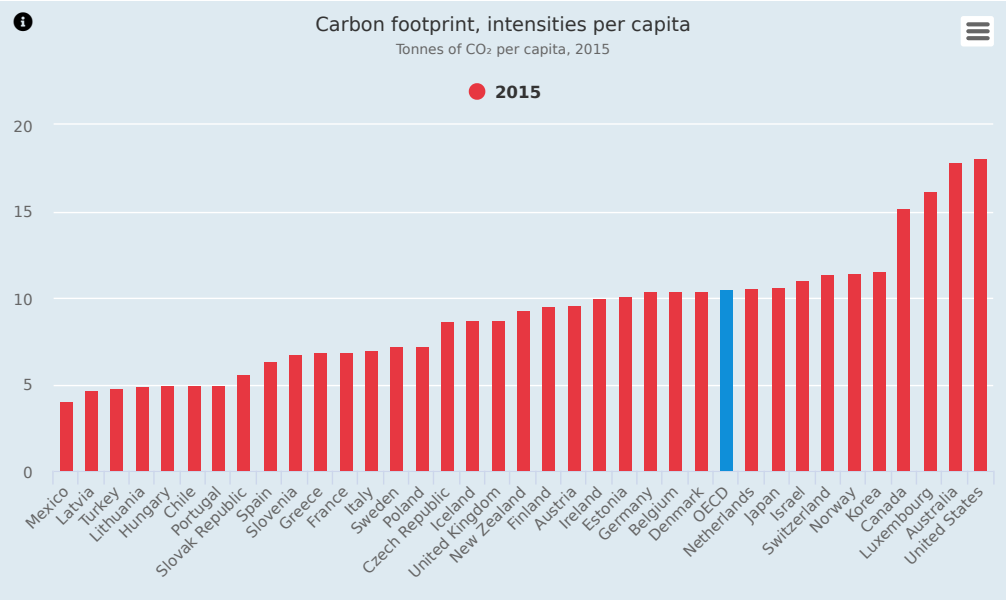
Lithuania
Iceland
Norway
Denmark
France
Ireland
Sweden
Switzerland


Carbon footprint, intensities per capita
Tonnes of CO₂ per capita, 2015
2015
20
15
10
5
0
Mexico
Latvia
Turkey
Lithuania
Hungary
Chile
Portugal
Slovak Republic
Spain
Slovenia
Greece
France
Italy
Sweden
Poland
Czech Republic
Iceland
United Kingdom
New Zealand
Finland
Austria
Ireland
Estonia
Germany
Belgium
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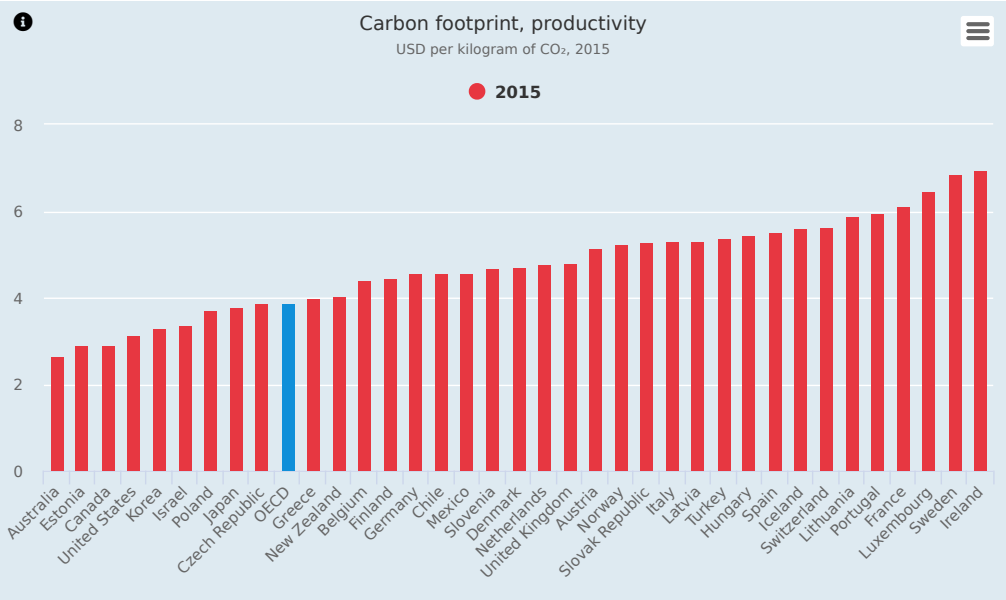
Netherlands
Japan
Israel
Switzerland
Norway
Korea
Canada
Luxembourg
Australia
United States



Comparability and interpretation

The CO_2 emission estimates are affected by the quality of the underlying energy data, but in general the comparability across countries is quite good. The low CO_2 emissions productivity of Estonia result from the use of oil shale for electricity generation. Oil shale has a high-carbon emission factor. The high per-capita emissions of Luxembourg result from the lower taxation of road fuels compared to neighbouring countries, which attracts drivers to refuel in the country.

Carbon productivity indicators inform about the relative decoupling between economic activity and carbon emissions into the atmosphere. They provide insight into how much carbon productivity has improved. They also measure how much of the improvement is due to domestic policies and how much to displacement or substitution effects. The demand perspective helps explain production-based trends.

Reductions in national emissions can also be achieved by offshoring domestic production and, thus, the related emissions. Evidence of decoupling based on domestic emissions, therefore, may reveal only part of the story.

For further details see the metadata in the source databases listed under *Sources* below.

Energy use

Key messages

- OECD countries continue to rely on **fossil fuels** for about 80% of their energy; **renewables** still play only a relatively minor role in energy mixes.
- **Energy intensity** decreased for OECD countries overall, but while some decoupling of environmental effects from growth in energy use has been achieved, results to date are insufficient to effectively reduce air and GHG emissions from energy use.

Main trends and recent developments

The **supply structure** varies considerably among countries. It is influenced by demand from industry, transport and households, by national energy policies and by national and international energy prices. Developments in TPES were accompanied by changes in the fuel mix. Since 2000, OECD countries' reliance on fossil fuels declined although it remains close to 80%. The shares of solid fuels and oil slightly fell, while those of natural gas and renewable energy rose. Biofuels and waste, followed by hydro represent the largest renewable sources.

In the 1990s and 2000s, **energy intensity** per unit of GDP decreased for OECD countries overall as a consequence of structural changes in the economy and energy conservation measures, and, since 2009, as a consequence of the slowdown in economic activity following the economic crisis. In some countries, the decrease was due to the transfer of energy-intensive industries to other countries. Such outsourcing may increase pressures on the global environment if less energy efficient techniques are involved. Progress in per capita terms has been slower, reflecting overall trends in energy supply and energy demand for transport.

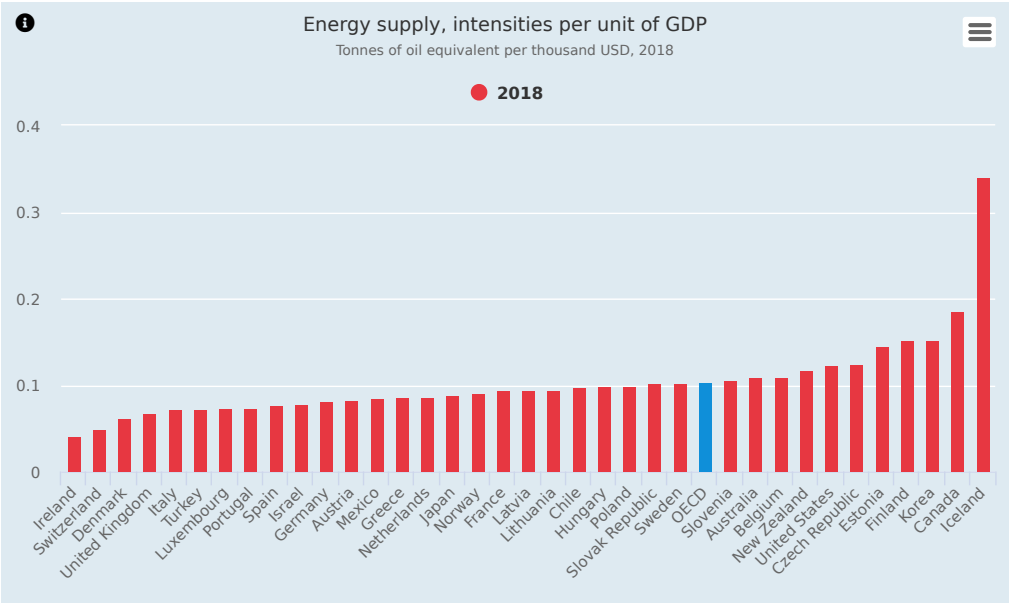
Variations in **energy intensity** among OECD countries are wide. They depend on national economic structure and income, geography, energy policies and prices, and countries' endowment in different types of energy resources. While some decoupling of environmental effects from growth in energy use has been achieved, results to date are insufficient to effectively reduce air and GHG emissions from energy use. Relative decoupling between TPES and GDP is occurring in all regions of the OECD, however, in OECD Asia-Oceania, it began much later (2003) than in OECD Europe and OECD America (1990).

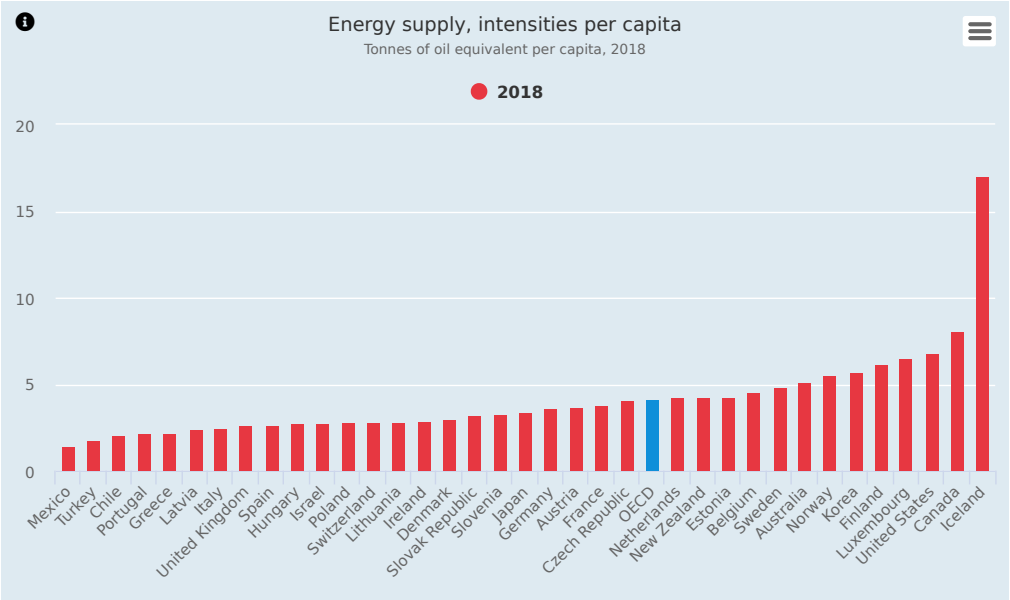
TPES per capita has declined by 10% on average across the OECD, with about two thirds of countries reducing their TPES intensity per capita. The highest decrease occurred in the United Kingdom. However, intensities per capita have risen in several Eastern European countries, Turkey and Iceland.

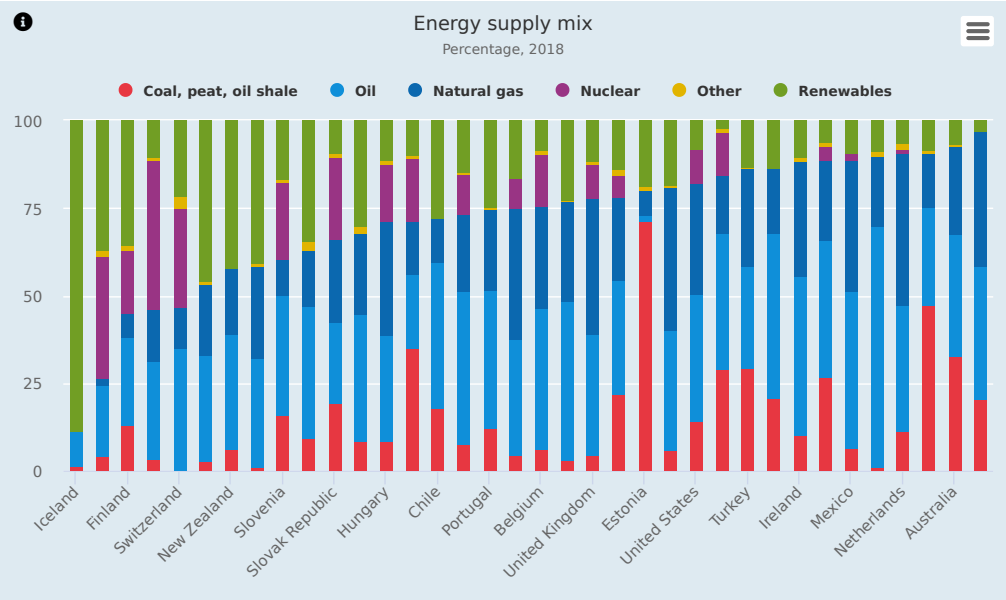
Renewables (i.e. solar, wind, liquid biofuels and biogases) with the lowest shares in TPES exhibited the highest growth rates over the last decade, now making up almost a quarter of electricity production. The largest renewable sources are biofuels and waste, followed by hydro. The growth in renewables was less affected by the economic crisis

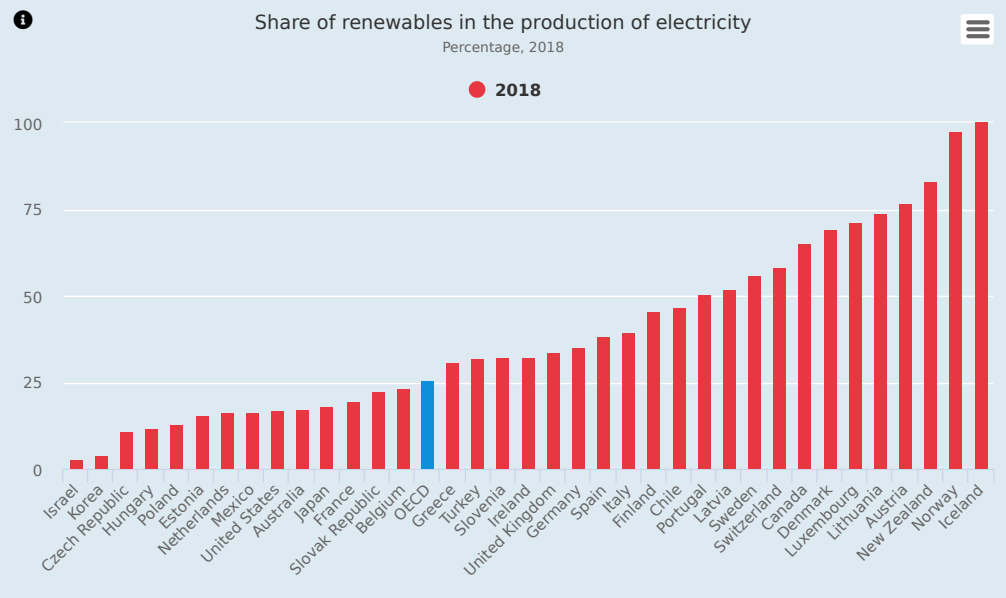
and was driven by OECD Europe, mostly due to the implementation of policies that promote renewable energy. Europe's energy mix also has the lowest share of fossil fuels and oil among OECD regions.

Indicators






Energy supply mix
Percentage, 2018
Coal, peat, oil shale
Oil
Natural gas
Nuclear
Other
Renewables
100
75
50
25
0
Iceland
Finland
Switzerland
New Zealand
Slovenia
Slovak Republic
Hungary
Chile
Portugal
Belgium
United Kingdom
Estonia
United States
Turkey
Ireland
Mexico
Netherlands
Australia


Share of renewables in the production of electricity
Percentage, 2018
2018
100
75
50
25
0
Israel
Korea
Czech Republic
Hungary
Poland
Estonia
Netherlands
Mexico
United States
Australia
Japan
France
Slovak Republic
Belgium
OECD
Greece
Turkey
Slovenia
Ireland
United Kingdom
Germany
Spain
Italy
Finland
Chile
Portugal
Latvia
Sweden
Switzerland
Canada
Denmark
Luxembourg
Lithuania
Austria
New Zealand
Norway
Iceland

Comparability and interpretation

Data quality is not homogeneous for all countries. In some countries, data are based on secondary sources, and where incomplete, estimates were made by the IEA. In general, data are likely to be more accurate for production and trade than for international bunkers or stock changes; and statistics for biofuels and waste are less accurate than those for traditional commercial energy data. The high values for Iceland are due to a significant increase in the production of hydro- and geothermal power mainly used in aluminium smelters. The supply structure, which may vary considerably among countries is dependent on final demands by industry, transport and the household sector, and is highly influenced by national energy policies and endowments in energy resources.

For further details see the metadata in the source databases listed under *Sources* below.

Taxes relevant for climate change

Key messages

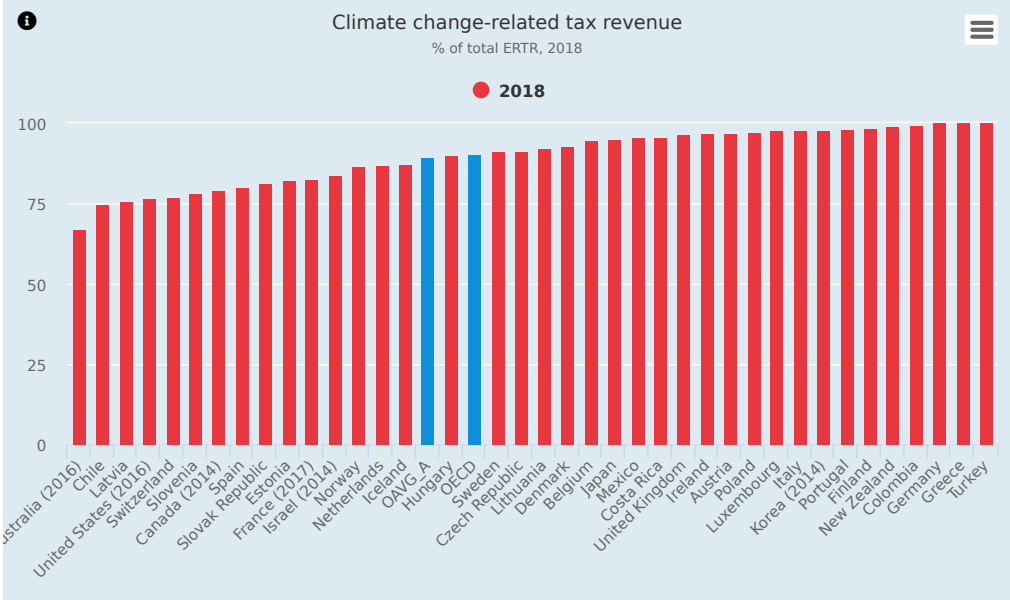
- In the OECD area, **climate change-related taxes** raised USD 726 billion in 2018, representing the majority of environmentally related tax revenue (90%).
- The bulk of climate change related tax revenue comes from taxing **energy** and **transport**; pollution and resource tax bases play a minor role in generating revenue.
- Overall, the share of **environmentally related tax revenue** (ERTR) continues to decline in OECD countries, amounting to 5.3% of total tax revenue in 2018, down from 6.1% in early 2000s. Compared to GDP, ERTR is also decreasing and reached 1.5% of GDP in 2018

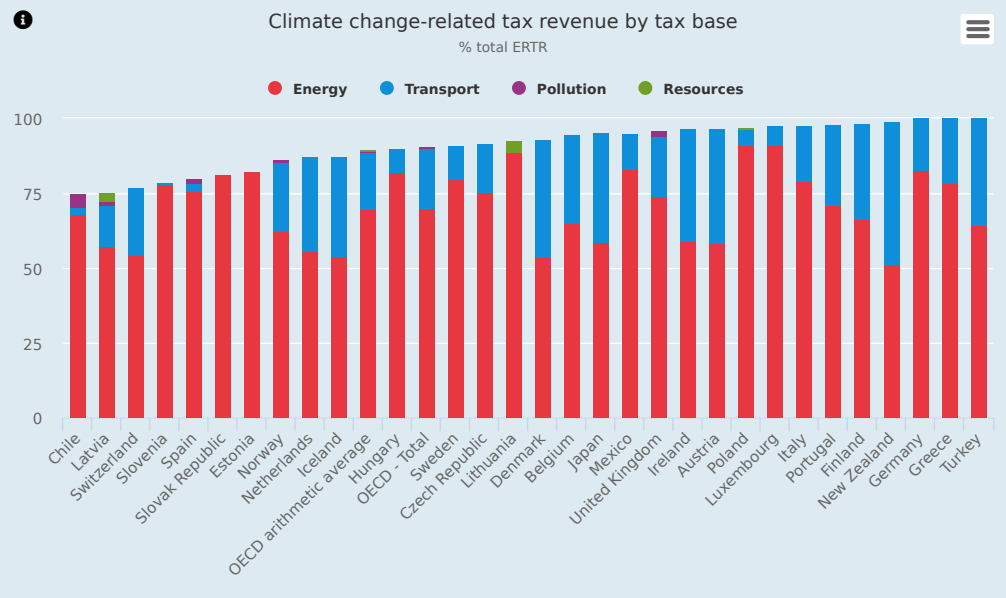
Main trends and recent developments

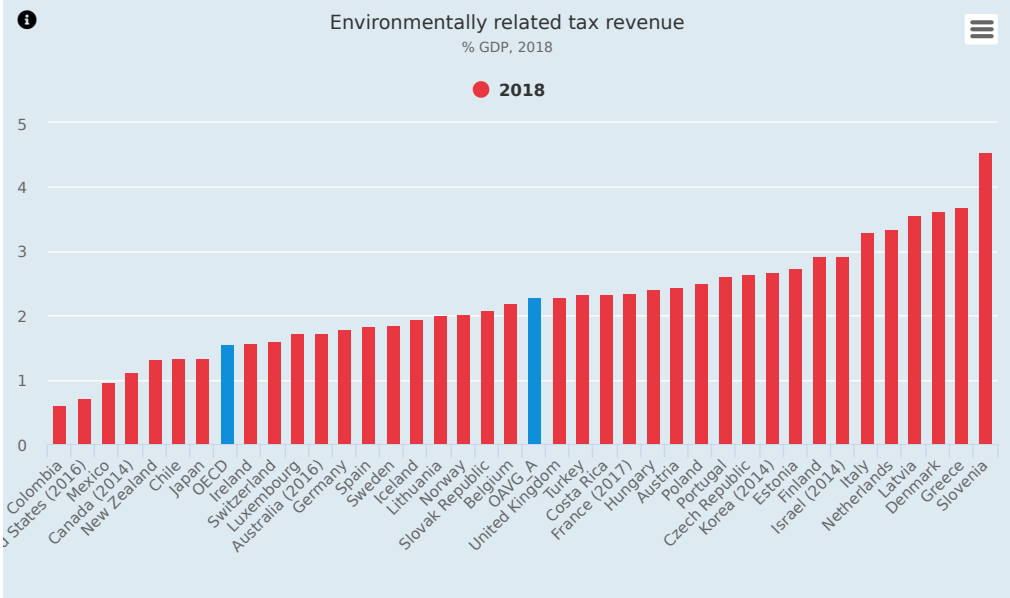
In the OECD area, climate change-related taxes raised USD 726 billion in 2018, representing the majority of environmentally related tax revenue (90%). This share has remained relatively unchanged since 2000. The bulk of revenue coming from taxes directed at climate change is raised from taxing energy (77%), in particular motor fuels, and transport (22%), while pollution and resource tax bases play a minor role in generating revenue. Pricing CO_2 and energy remains the most economically efficient tool to bend the direction of carbon emissions globally, and create favourable conditions to mobilise private finance and investment required to achieve global mitigation objectives. Taxes on tax bases such as logging, forestry products and land use change, in turn, can help safeguard planetary carbon sinks and encourage carbon sequestration.

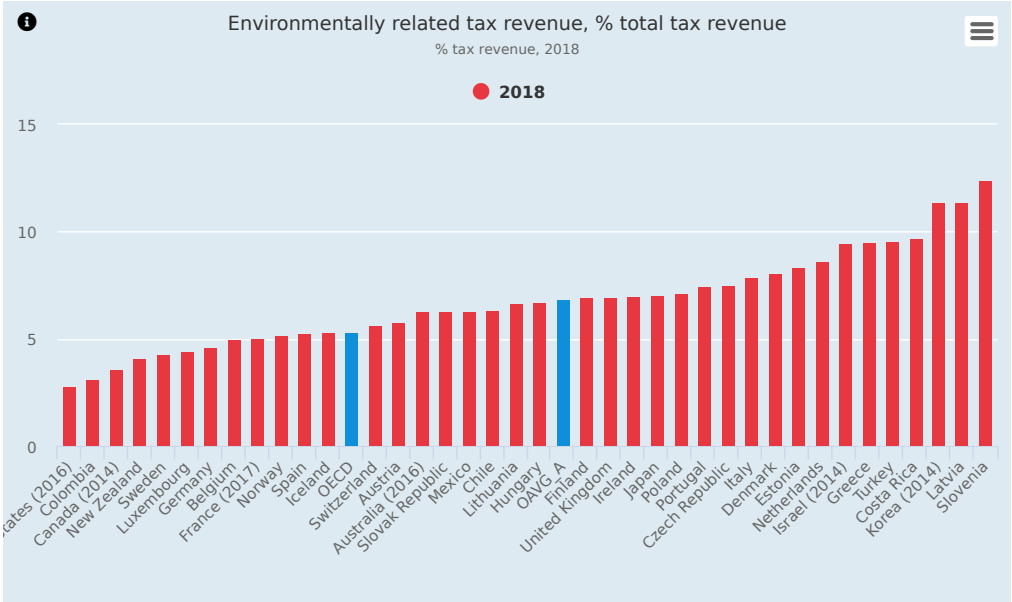
Overall, the share of environmentally related tax revenue (ERTR) continues to decline in OECD countries, amounting to 5.3% of total tax revenue in 2018, down from 6.1% in early 2000s. Compared to GDP, ERTR is also decreasing and reached 1.5% of GDP in 2018. The decreasing trend is a combination of factors, namely, that tax rates are typically defined in physical units (e.g. per litre) and hence are set in nominal terms. Without inflation adjustment, these rates decrease in real terms over time. While countries such as Denmark, the Netherlands and Sweden have implemented such adjustments, most OECD countries do not yet apply inflation adjustments to environmentally related taxes. Another factor contributing to this trend is the increase in crude oil prices up until mid-2014, which triggered substitution away from motor fuel use, also making adjustments in nominal tax rates on motor fuels politically difficult. Yet some countries, such as Slovenia, Costa Rica, Turkey and Estonia strengthened the role of environmentally related taxes and have tripled their share of tax revenue since 2000.

Indicators




Climate change-related tax revenue by tax base
% total ERTR
Energy
Transport
Pollution
Resources
100
75
50
25
0
Chile
Latvia
Switzerland
Slovenia
Spain
Slovak Republic
Estonia
Norway
Netherlands
Iceland
OECD arithmetic average
Hungary
OECD - Total
Sweden
Czech Republic
Lithuania
Denmark
Belgium
Japan
Mexico
United Kingdom
Ireland
Austria
Poland
Luxembourg
Italy
Portugal
Finland
New Zealand
Germany
Greece
Turkey


Environmentally related tax revenue
% GDP, 2018
2018
5
4
3
2
1
0
Colombia
United States (2016)
Mexico
Canada (2014)
New Zealand
Chile
Japan
OECD
Ireland
Switzerland
Luxembourg
Australia (2016)
Germany
Spain
Sweden
Iceland
Lithuania
Norway
Slovak Republic
Belgium
OAVG_A
United Kingdom
Turkey
Costa Rica
France (2017)
Hungary
Austria
Poland
Portugal
Czech Republic
Korea (2014)
Estonia
Finland
Israel (2014)
Italy
Netherlands
Latvia
Denmark
Greece
Slovenia



Comparability and interpretation

The indicators on environmentally related taxes should not be used to assess the "environmental friendliness" of the tax systems. For such analysis, additional information, describing the economic and taxation structure of each country, is required. Moreover, a number of environmentally related taxes can have important environmental impacts even if they raise little (or no) revenue. In addition, revenue from fees and charges, and from royalties related to resource management, is not included.

Comparisons of ERTRs in OECD countries provide a useful starting point for analysing the impact of environmental taxation, however, comparing only the levels of revenue does not provide the full picture of a country's environmental policy, as it does not provide information on the levels of tax rates or the exemptions applied. Other parts of the OECD PINE database, including information on tax rates and exemptions, allows deeper assessment of the environmental impacts of these taxes. In addition, governments may choose to implement environmental policy using a range of other instruments, including fees and charges, expenditures (both direct and subsidies) and regulation, some of which are also detailed in the PINE database (see *http://oe.cd/pine* for information on the use of alternative instruments in countries).

For further details see the metadata in the source databases listed under *Data sources* below.

Fossil fuel subsidies and other support measures

Key messages

- OECD countries provided around USD 108 billion in **support for fossil fuels** in 2019, 18% higher than in 2018. Government support for fossil-fuel production and use has risen again driven largely by increased support to the fossil-fuel production sector.
- In 2019, increases in production support were largely driven by the additional incentives benefitting the **oil and gas** sector, mostly through direct budgetary support to absorb corporate debt, fossil-fuel infrastructure investments, and tax provisions that provide preferential treatment on capital expenditures for fossil-fuel production. .
- **Hard-coal industry** in Western Europe has been phased out and efforts to end state aid to coal-fired power generation in the European Union are continuing.

Main trends and recent developments

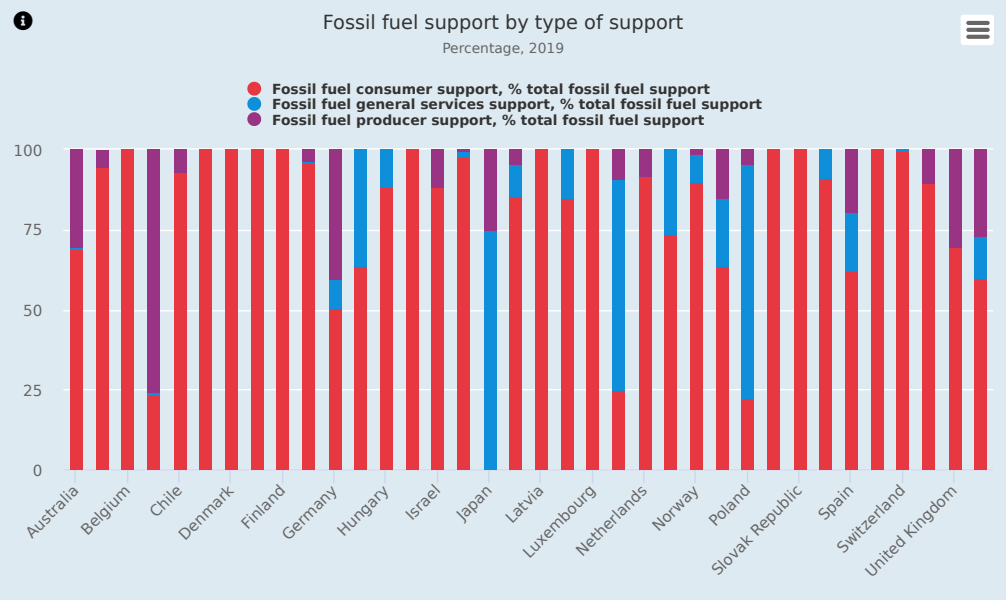
Many governments continue to support fossil fuel production and use financially, in particular oil and gas. This undermines the effectiveness of environmental policies by lowering the cost of emitting carbon and is a barrier to moving towards a more energy efficient and low-carbon economy. It can also impose a strain on government budgets.

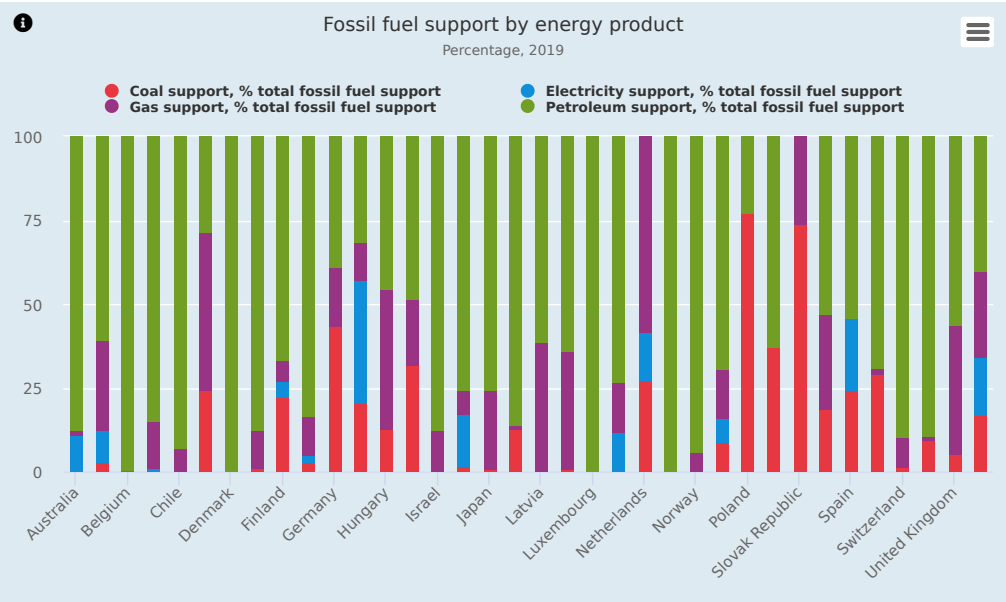
OECD countries provided around USD 108 billion in **support for fossil fuels** in 2019, 18% higher than the previous year.

The recent increase in support is in large part explained by increases seen in general services support estimates (GSSE) and producer support estimates (PSE). Most of the support in OECD countries (70%) goes to the **consumption of fossil fuels**, and in particular petroleum. For several countries, estimates of support pertain exclusively to consumption, a feature that has much to do with geological factors and the decline in coal production observed throughout Europe. In the cases of countries possessing abundant fossil resources, the share of producer support tends to be higher.

On the **production** side, the subsidised hard-coal industry in Western Europe has been phased out and efforts to end state aid to coal-fired power generation in the European Union are continuing. A recent EU decision aims at ending state aid to high-emission power plants and effectively eliminating subsidies to coal by 2025. At the same time, the oil and gas sector continues to benefit from government incentives in several countries, mostly through direct budgetary support to absorb corporate debt, fossil-fuel infrastructure investments, and tax provisions that provide preferential treatment on capital expenditures for fossil-fuel production. Such policies could go against domestic efforts to reduce global greenhouse gas (GHG) emissions.

Indicators


Fossil fuel support by type of support
Percentage, 2019
Fossil fuel consumer support, % total fossil fuel support
Fossil fuel general services support, % total fossil fuel support
Fossil fuel producer support, % total fossil fuel support
100
75
50
25
0
Australia
Belgium
Chile
Denmark
Finland
Germany
Hungary
Israel
Japan
Latvia
Luxembourg
Netherlands
Norway
Poland
Slovak Republic
Spain
Switzerland
United Kingdom


Fossil fuel support by energy product
Percentage, 2019
Coal support, % total fossil fuel support
Gas support, % total fossil fuel support
Electricity support, % total fossil fuel support
Petroleum support, % total fossil fuel support
100
75
50
25
0
Australia
Belgium
Chile
Denmark
Finland
Germany
Hungary
Israel
Japan
Latvia
Luxembourg
Netherlands
Norway
Poland
Slovak Republic
Spain
Switzerland
United Kingdom

Comparability and interpretation

The OECD Inventory of Support Measures for Fossil Fuels, which covers 44 OECD and G20 economies, identifies and estimates policies that support the production or consumption of fossil fuels. It includes direct budgetary transfers and tax expenditures that may provide a benefit or preference for fossil-fuel production or consumption relative to alternatives. Unlike direct budgetary expenditures, where outlays can usually be measured, tax expenditures are estimates of the fiscal revenue that is foregone due to a particular feature of the tax system that reduces a tax rate relative to a benchmark tax rate. It is important to note that definitions of tax expenditures, and the benchmarks used to estimate their size, are nationally determined. Therefore, tax expenditure estimates require caution when used for international comparability of fossil fuel support.

For further details see the metadata in the source databases listed under *Data sources* below.

Glossary

Carbon dioxide (CO_2) emissions from energy use (production-based CO_2 emissions)	Refer to gross direct CO_2 emissions from fossil fuel combustion, emitted within the national territory. Human-caused emissions from other sources are not included. Emissions from oil held in international marine and aviation bunkers are excluded. CO_2 removal by sinks, indirect emissions from land use changes and indirect effects through interactions in the atmosphere are not taken into account.
Carbon footprint (demand-based CO_2 emissions)	Refer to the CO_2 from energy use emitted during the various stages of production (in the country or abroad) of goods and services consumed in domestic final demand.
Climate change-related tax revenue	Revenue raised from taxes and auctioning of tradable permits directed at climate change. These include specific taxes on i) energy products and revenue from auctioning of CO2 tradable allowances; ii) use of motor vehicles, iii) pollution (e.g. cement production); and iv) resource extraction (e.g. forestry taxes). The information on taxes and the associated tax revenue is extracted from the OECD Policy Instruments for the Environment (PINE) database (*http://oe.cd/pine*). The PINE database, contains quantitative and qualitative information on over 3500 policy instruments in 110 countries worldwide. Policy instruments are tagged into 13 environmental domains that represent the focal issues (environmental externalities). Instruments can have both a direct and an indirect effect on several environmental domains; however, only the domain to which the instrument has a direct effect is considered. For more details, see the metadata to the *OECD Environmentally related tax revenue dataset*.
Greenhouse gas emissions statistics	The following sources of greenhouse gas statistics are used in this document: • National GHG inventories: OECD Environment Statistics (database) based on national inventory submissions to the United Nations Framework Convention on Climate Change (UNFCCC, CRF tables), and replies to the OECD State of the Environment Questionnaire. These statistics come from official submissions of GHG emissions data by Parties to the UNFCCC. Complete data sets including and excluding land use, land-use change and forestry (LULUCF) are available for Annex I Parties to the UNFCCC and partial data sets are available for non-Annex I Parties. • IEA statistics on CO_2 emissions: IEA estimates of CO_2 emissions from fuel combustion are calculated using IEA energy data and the default methods and emission factors from the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories. • IEA/EDGAR statistics on total GHG emissions: This dataset combines IEA statistics on CO_2 from fossil fuel combustion with data for CO2 from non-energy-related sources and gas flaring, and emissions of methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride from the Emissions Database for Global Atmospheric Research (EDGAR). The EDGAR database includes partial coverage of emissions from land use, land-use change and forestry (direct emissions from forest fires, emissions from decay of aboveground biomass that remains after logging and deforestation, emissions from peat fires and decay of drained peat soils).
Greenhouse gas emissions	Greenhouse gas (GHG) emissions refer to the sum of GHGs that have direct effects on climate change and are considered responsible for a major part of global warming: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF3). Greenhouse gas emission estimates are divided into main sectors, which are groupings of related processes, sources and sinks: • 1 – Energy (energy industries, manufacturing industries, transport and other energy uses) • 2 - Industrial Processes and Product Use (IPPU) • 3 - Agriculture • 5 - Waste • 6 - Other (e.g., indirect emissions from nitrogen deposition from non-agriculture sources). They refer to GHGs emitted within the national territory and exclude CO_2 emissions and removals from category 4 - Land use change and forestry. They do not cover international transactions of emission reduction units or certified emission reductions.
Total fossil fuel support	Comprises Consumer Support Estimates (CSE), Producer Support Estimates (PSE) and General Services Support Estimate (GSSE), for petroleum, coal and natural gas. Measures that benefit individual producers are classified under the PSE, while those that benefit individual consumers are classified under the CSE. Measures benefitting producers or consumers collectively are classified under the GSSE, as are measures that do not increase current production or consumption of fossil fuels but that may do so in the future. The definition of support encompasses policies that can induce changes in the relative prices of fossil fuels in the support estimate level. Fossil fuel support by type of support refer the share of consumption, production and general services support in total fossil fuel support. Fossil fuel support by fuel refer to the share of petroleum, coal and gas support in in total fossil fuel support.

Total primary energy supply	Total primary energy supply (TPES) is made up of production + imports – exports – international marine bunkers – international aviation bunkers ± stock changes. Primary energy comprises coal, peat and peat products, oil shale, natural gas, crude oil and oil products, nuclear, and renewable energy (bioenergy, geothermal, hydropower, ocean, solar and wind). Electricity trade is included in total primary energy supply, but excluded from the calculation of the breakdown by source. The share of renewables in the production of electricity. The main renewable forms are hydro, geothermal, wind, biomass, waste and solar energy.
Total fossil fuel support	Comprises Consumer Support Estimates (CSE), Producer Support Estimates (PSE) and General Services Support Estimate (GSSE), for petroleum, coal and natural gas. Measures that benefit individual producers are classified under the PSE, while those that benefit individual consumers are classified under the CSE. Measures benefitting producers or consumers collectively are classified under the GSSE, as are measures that do not increase current production or consumption of fossil fuels but that may do so in the future. The definition of support encompasses policies that can induce changes in the relative prices of fossil fuels in the support estimate level. Fossil fuel support by type of support refer the share of consumption, production and general services support in total fossil fuel support. Fossil fuel support by fuel refer to the share of petroleum, coal and gas support in in total fossil fuel support.

Data sources

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Citation

OECD, "Environment at a Glance: Climate change", *Environment at a Glance: Indicators*, *www.oecd.org/environment/env-at-a-glance*.

Metadata, Legal and Rights

https://doi.org/10.1787/ac4b8b89-en