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CO₂ emissions from fuel combustion

HIGHLIGHTS



International
Energy Agency
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2017

CO₂ emissions from fuel combustion

HIGHLIGHTS

2017

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA), an autonomous agency, was established in November 1974. Its primary mandate was – and is – two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply, and provide authoritative research and analysis on ways to ensure reliable, affordable and clean energy for its 29 member countries and beyond. The IEA carries out a comprehensive programme of energy co-operation among its member countries, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports. The Agency's aims include the following objectives:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions.
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context – particularly in terms of reducing greenhouse-gas emissions that contribute to climate change.
- Improve transparency of international markets through collection and analysis of energy data.
- Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies.
- Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations and other stakeholders.

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FOREWORD

The energy sector is in a state of transition. In recent years, we have seen a fundamental shift in the way governments around the world approach energy-related environmental issues, with policy considerations increasingly driven by concerns about environmental sustainability, economic competitiveness, energy security, air pollution and climate change. The goal is to create a clean, sustainable, affordable and accessible global energy system.

As such, climate change remains a key focus of IEA work – and a central aspect of this work is providing complete, accurate and timely data. The IEA works with the IEA family of countries and beyond to improve reporting of energy data, ultimately resulting in more accurate estimations of CO₂ emissions.

This is important, because energy accounts for approximately two-thirds of total greenhouse gas emissions and around 80% of CO₂. Any effort to reduce emissions and mitigate climate change must include the energy sector.

Based on official energy data and IPCC methodologies, this publication represents the most comprehensive set of estimates of CO₂ emissions from fuel combustion across the globe and all sectors of the economy.

In the lead-up to the UN climate negotiations at COP23 in Bonn, Germany, which follow the successful outcomes of the Paris and Marrakech meetings, this latest information on the level and growth of CO₂ emissions from fuel combustion, their source and geographic distribution will be vital for the participants and decision makers in the UNFCCC process.

This edition includes data from 1971 to 2015 for more than 150 countries and regions worldwide – by sector and by fuel – as well as a number of CO₂-related indicators. It is our hope that this breakdown will assist the reader in better understanding the evolution of emissions worldwide.

The IEA will continue to provide accurate data to inform the debate and ultimately promote evidence-based policy recommendations on the complex, but critically important, relationship between energy and climate change.

Dr. Fatih Birol
Executive Director

2017 Highlights

This excerpt from the CO₂ emissions from fuel combustion 2017 publication contains an extensive selection of CO₂ emissions data for over 150 countries and regions, including detailed graphs and tables for the world and regional aggregates, and an analysis of recent trends. Emissions are based on the IEA World energy balances 2017 and on the 2006 IPCC Guidelines for greenhouse gas inventories.

For more comprehensive data by country and sector, please refer to the IEA data service portal (<http://www.iea.org/statistics/onlinedataservice/>); for the full publication please refer to the IEA Bookshop (<http://www.iea.org/publications/>).

Inquiries should be addressed to emissions@iea.org.

Please note that all IEA data is subject to the following Terms and Conditions found on the IEA's website: <https://www.iea.org/t&c/termsandconditions/>.

What's new?

New focus on Association countries and on geographic regions

In the 2017 edition, six new regional aggregates are added as a response to user requests. Firstly, the *IEA and Accession/Association countries* aggregate is added to show the wider connections the IEA has beyond members as part of the continuous development of the IEA's work; this shows member countries, Accession countries and Association countries as a whole. The five regional geographic aggregates are also included: Africa, Americas, Asia, Europe and Oceania, which are based on country aggregations in line with the UN's geographic regions. Note that these aggregates – apart from Africa - have different coverage from those historically presented in this publication (e.g. Armenia is included in Non-OECD Europe and Eurasia and in Asia at the same time). For the list of countries in each aggregation, please refer to the section "Geographical coverage".

New OECD member: Latvia

Latvia became an OECD member in July 2016. Accordingly, Latvia appears in the list of OECD members and is included in the zone aggregates for data from 1990, starting with the 2017 edition. Prior to 1990, data for Latvia are included in Former Soviet Union.

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Important cautionary notes

The estimates of CO₂ emissions from fuel combustion presented in this publication are calculated using the IEA energy balances and the default methods and emission factors from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. There are many reasons why **the IEA Secretariat estimates of CO₂ emissions from fuel combustion may not be the same as the figures that a country submits to the UNFCCC**, even if a country has accounted for all of its energy use and correctly applied the *IPCC Guidelines*.

In this publication, the IEA Secretariat presents CO₂ emissions from fuel combustion. IEA estimates include emissions from all reported energy use of fuels, but exclude emissions from non-energy use of fuels. Such totals may differ from those calculated using the Sectoral Approach of the *2006 IPCC Guidelines*, as under these guidelines some fuel combustion emissions have been reallocated out of the Source category energy and reclassified as industrial process emissions.

Information on “key sources” from fuel combustion, as developed in the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, are only given for combustion sources and will not include key sources from fugitive emissions, industrial processes, solvents, agriculture and waste. Please see the chapters *IEA emissions estimates* and *IPCC methodologies* for further information.

Energy data on OECD member and non-member countries¹ are collected by the Energy Data Centre (EDC) of the IEA Secretariat, headed by Mr. Duncan Millard. The IEA would like to thank and acknowledge the dedication and professionalism of the statisticians working on energy data in the respective countries.

Summary data for other greenhouse gases and sources are provided in cooperation with the PBL Netherlands Environmental Assessment Agency and the Joint Research Centre of the European Commission (JRC).

Mr. Loïc Coënt was responsible for the CO₂ emissions from fuel combustion estimates, and for the preparation of the publication. Input on international mitigation efforts was provided by Ms. Christina Hood. Desktop publishing support was provided by

Ms. Sharon Burghgraeve. Ms. Roberta Quadrelli had overall responsibility for this publication.

CO₂ emission estimates from 1960 to 2015 for the Annex II countries and from 1971 to 2015 for all other countries are available on our online data service and on CD-ROM suitable for use on Windows-based systems. To order, please see the information provided at the end of this publication. Moreover, data can also be obtained on a pay-per-view basis. Details are available at www.iea.org/statistics.

Enquiries about data or methodology should be addressed to:

Energy Data Centre – CO₂ emissions
Telephone: (+33-1) 40-57-66-01
E-mail: emissions@iea.org

1. This document is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. In this publication, “country” refers to a country or a territory, as the case may be.

1. CO₂ EMISSIONS OVERVIEW

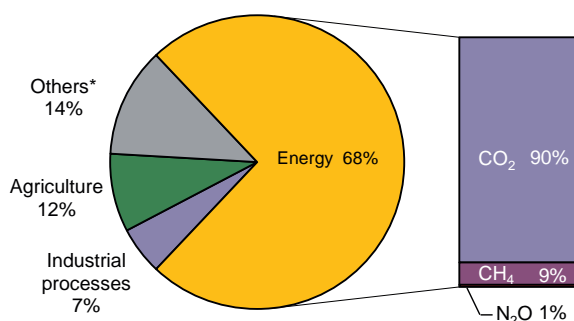
The growing importance of energy-related emissions

Climate scientists have observed that carbon dioxide (CO₂) concentrations in the atmosphere have been increasing significantly over the past century, compared to the pre-industrial era level of about 280 parts per million (ppm). In 2016, the average concentration of CO₂ (403 ppm)¹ was about 40% higher than in the mid-1800s, with an average growth of 2 ppm/year in the last ten years. Significant increases have also occurred in the levels of methane (CH₄) and nitrous oxide (N₂O).

Energy use and greenhouse gases

The *Fifth Assessment Report* from the Intergovernmental Panel on Climate Change (Working Group I) states that human influence on the climate system is clear (IPCC, 2013). Among the many human activities that produce greenhouse gases, the use of energy represents by far the largest source of emissions. Smaller shares correspond to agriculture, producing mainly CH₄ and N₂O from domestic livestock and rice cultivation, and to industrial processes not related to energy, producing mainly fluorinated gases and N₂O (Figure 1).

Figure 1. Estimated shares of global anthropogenic GHG, 2014



* Others include large-scale biomass burning, post-burn decay, peat decay, indirect N₂O emissions from non-agricultural emissions of NO_x and NH₃, Waste, and Solvent Use.

Source: based on IEA estimates for CO₂ from fuel combustion and EDGAR version 4.3.2 for CO₂, CH₄ and N₂O emissions and 4.2FT2010 for the F-gases; based on 100-year Global Warming Potential (GWP).

Within the energy sector², CO₂ resulting from the oxidation of carbon in fuels during combustion dominates total GHG emissions.

CO₂ emissions from energy account for the largest share of global anthropogenic GHG emissions, representing over three quarters of emissions from

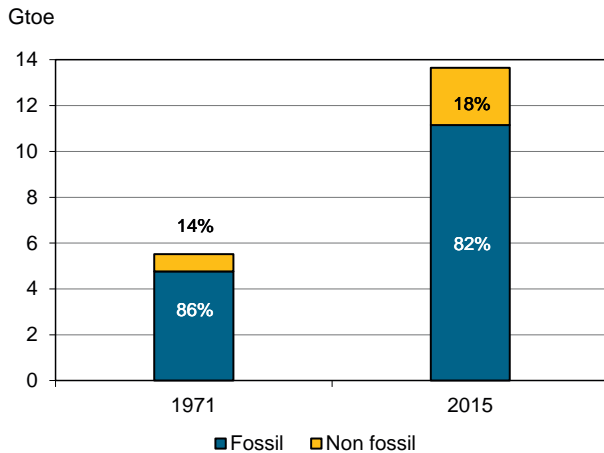
1. Globally averaged marine surface annual mean expressed as a mole fraction in dry air. Ed Dlugokencky and Pieter Tans, NOAA/ESRL (www.esrl.noaa.gov/gmd/ccgg/trends/).

2. The energy sector includes emissions from “fuel combustion” (the large majority) and “fugitive emissions”, which are intentional or unintentional releases of gases resulting from production, processes, transmission, storage and use of fuels (e.g. CH₄ emissions from coal mining).

Annex I³ countries, and about 58% of global emissions.⁴ This percentage varies greatly by country, due to diverse national structures.

Increasing demand for energy comes from worldwide economic growth and development. Global energy demand as measured by total primary energy supply (TPES) increased by almost 150% between 1971 and 2015, still mainly relying on fossil fuels (Figure 2).

Figure 2. World primary energy supply*



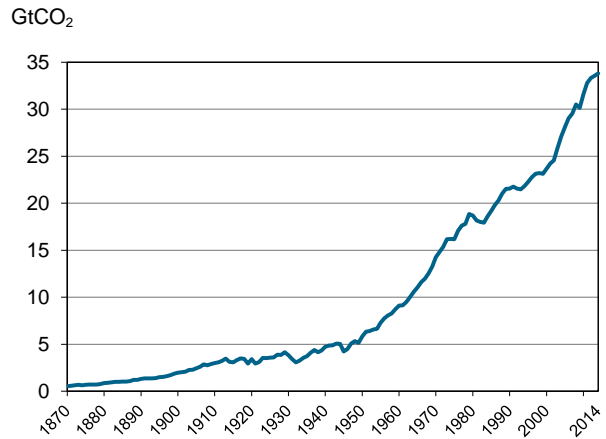
* World primary energy supply includes international bunkers. In this graph, non-renewable waste is included in Fossil.

Despite the growth of non-fossil energy (considered as non-emitting⁵), especially in electricity generation where it now accounts for 34% of the global figure (including nuclear, hydropower and other renewable sources), the share of fossil fuels within the world energy supply is relatively unchanged over the past four decades. In 2015, fossil sources accounted for 82% of the global TPES.

The growth in world energy demand from fossil fuels has played a key role in the upward trend in CO₂ emissions (Figure 3). Since the Industrial Revolution, annual CO₂ emissions from fuel combustion have

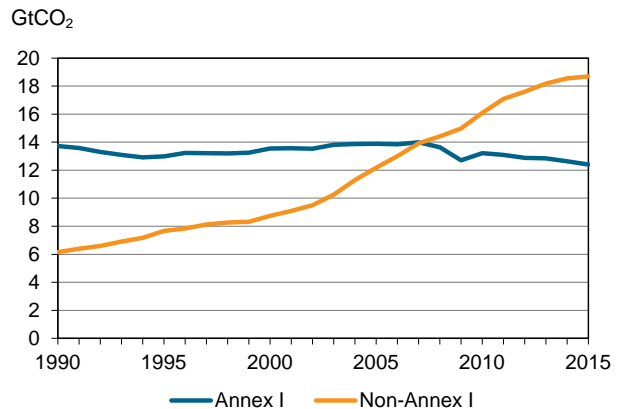
dramatically increased from near zero to over 33 GtCO₂ in 2015.

Figure 3. Trend in CO₂ emissions from fossil fuel combustion, 1870-2014



Source: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, US Department of Energy, Oak Ridge, Tenn., United States.

Figure 4. Regional CO₂ emissions trends, 1990-2015



More recently, since 1990, emissions in non-Annex I countries have tripled, while emissions in Annex I countries have declined slightly (Figure 4).

The next section provides a brief overview of recent trends in energy-related CO₂ emissions, as well as in some of the socio-economic drivers of emissions.

3. See *Geographical coverage*.

4. Based on 100-year Global Warming Potential (GWP).

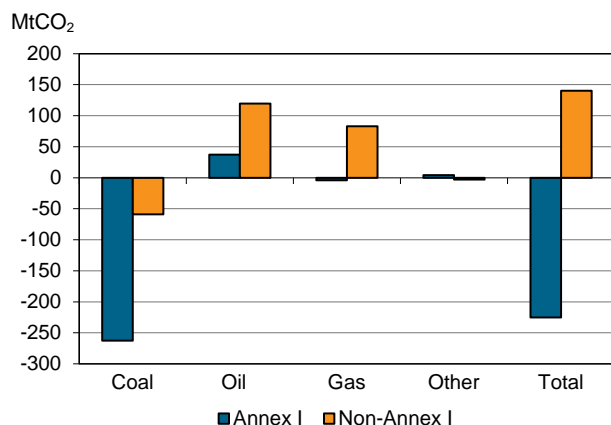
5. Excluding the life cycle of all non-emitting sources and excluding combustion of biofuels (considered as non-emitting CO₂, based on the assumption that the released carbon will be reabsorbed by biomass regrowth, under balanced conditions).

Recent emissions trends

In 2015, global CO₂ emissions reached 32.3 GtCO₂, which is comparable to the 2014 level⁶ (-0.1%). This contrasts with the growth rates seen in 2013 (1.7%) and 2014 (0.6%), and with the average annual growth rate since 2000 (2.2%). The year 2015 was the first year since the 1990s in which our data do not show a global increase in CO₂ emissions from fuel combustion whilst the global economy keeps growing.

Emissions in non-Annex I countries continued to increase (0.8%), although at a slower rate than in previous years, while emissions in Annex I countries decreased (-1.8%) due to visible declines in emissions from coal (-6.5%). In absolute terms, the global emissions trend was driven by increases from oil and natural gas in non-Annex I countries, compensated by decreased emissions from coal mainly in Annex I countries (Figure 5).

Figure 5. Change in CO₂ emissions, 2014-2015

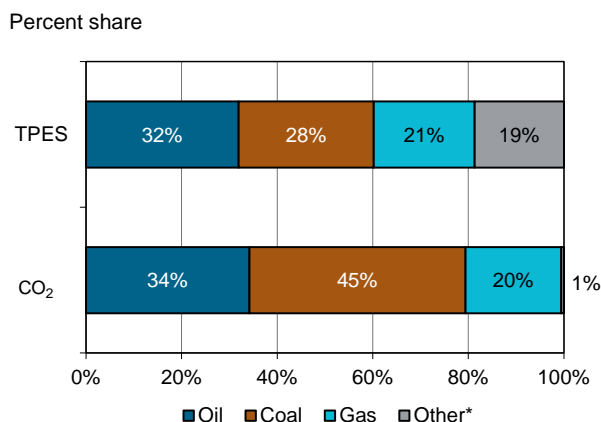


Emissions by fuel

Although coal represented 28% of the world TPES in 2015, it accounted for 45% of the global CO₂ emissions due to its heavy carbon content per unit of energy released, and to the fact that almost one fifth of the TPES derives from carbon-neutral fuels (Figure 6).

Compared to gas, coal is nearly twice as emission intensive on average.⁷

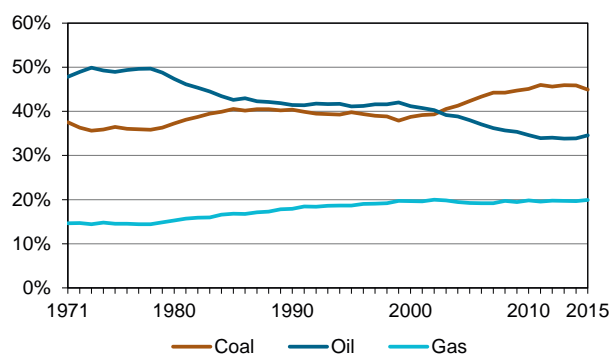
Figure 6. World primary energy supply and CO₂ emissions: shares by fuel in 2015



* Other includes nuclear, hydro, geothermal, solar, tide, wind, biofuels and waste.

From the late 1980s until the early 2000s, coal and oil were each responsible for approximately 40% of global CO₂ emissions, with emissions from oil generally exceeding those from coal by a few percentage points. However, the trends differed at a regional level. In Annex I countries, oil is the largest source of fuel combustion emissions, whereas, in non-Annex I countries emissions from coal ranked highest. Since then, mainly due to the increasing influence of non-Annex I countries, coal has increased from 39% in 2002 to 45% in 2015, while oil has decreased from 40% to 35%, with natural gas approximately stable at 20% of global emissions (Figure 7).

Figure 7. Fuel shares in global CO₂ emissions



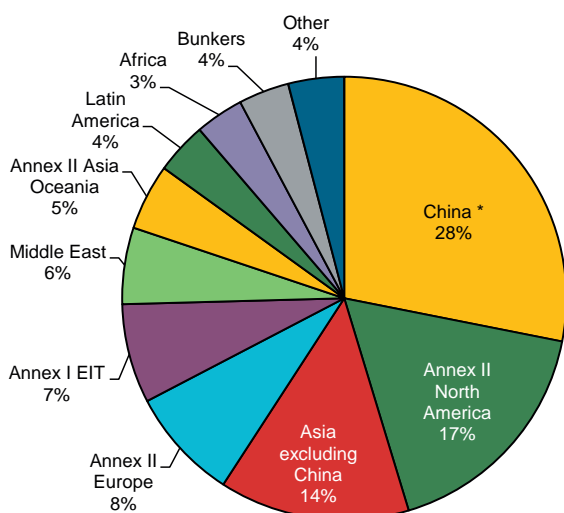
6. The IEA CO₂ emissions estimates are derived from the IEA energy balances, which use official country data to the maximum extent possible. The IEA is continuously working together with national administrations worldwide to ensure data quality improvements in the longer-term. As this work progresses, revisions to the underlying energy data and thus the CO₂ estimates may occur.

7. Default carbon emission factors from the 2006 IPCC Guidelines: 15.3 tC/TJ for gas, 15.7 to 26.6 tC/TJ for oil products, 25.8 to 29.1 tC/TJ for primary coals.

Emissions by region

Non-Annex I countries, collectively, represented 58% of global CO₂ emissions in 2015, while Annex I countries represented 38%, with international marine and aviation bunkers responsible for the remaining 4%. On a regional level, the contributions to global CO₂ emissions vary greatly: in 2015, China (28%) and Annex II North America⁹ (17%) were responsible for the largest share of emissions, followed by Asia excluding China⁸ (12%), Annex II Europe⁹ (8%) and Annex I EIT⁹ (7%), with smaller shares coming from the Middle East (5%), Annex II Asia Oceania (5%), Latin Americas (4%) and Africa (4%) (Figure 8).

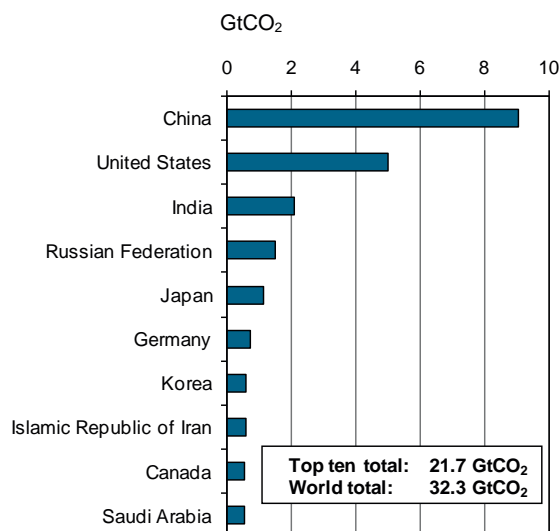
Figure 8. CO₂ emissions by region, 2015



* China includes Hong Kong, China.

Regional differences conceal even larger differences among individual countries. Over two-thirds of global emissions for 2015 originated from just ten countries, with the shares of China (28%) and the United States (15%) far surpassing those of all others. Combined, these two countries alone produced 14.0 GtCO₂. The top ten emitting countries include five Annex I countries and five non-Annex I countries (Figure 9).

Figure 9. Top ten emitting countries, 2015

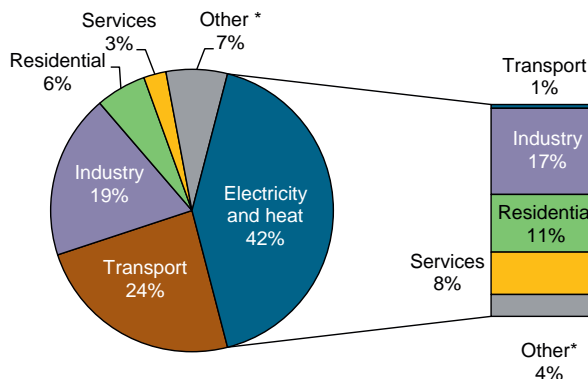


As different regions and countries have contrasting economic and social structures, the picture changes significantly when moving from absolute emissions to indicators such as emissions per capita or per GDP. A more comprehensive analysis is given in the section *Coupling emissions with socio-economic indicators* later in this discussion.

Emissions by sector

Two sectors produced two-thirds of global CO₂ emissions from fuel combustion in 2015: electricity and heat generation, by far the largest, which accounted for 42%, and transport, accounting for 24% (Figure 10).

Figure 10. World CO₂ emissions from fuel combustion by sector, 2015



The graph also shows allocation of electricity and heat to end-use sectors. * Other includes agriculture/forestry, fishing, energy industries other than electricity and heat generation, and other emissions not specified elsewhere.

8. For the purposes of this discussion, Asia excludes China and includes Korea. Japan is included in Annex 2 Asia Oceania.

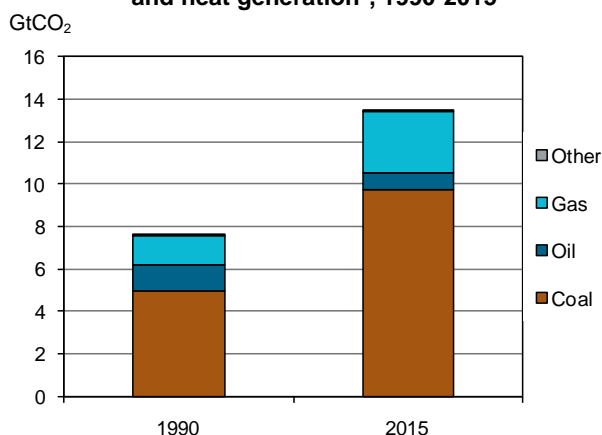
9. See *Geographical coverage*

Despite an increase in the share of renewables, generation of electricity and heat worldwide relies heavily on coal, the most carbon-intensive fossil fuel. Countries such as Australia, China, India, Poland and South Africa produce over two-thirds of their electricity and heat through the combustion of coal.

Between 2014 and 2015, CO₂ emissions from electricity and heat decreased by 0.9%, compared with an increase of 0.4% between 2013 and 2014, and 1.4% between 2012 and 2013. While the share of oil in electricity and heat emissions has declined steadily since 1990, the share of gas increased slightly, and the share of coal increased significantly, from 65% in 1990 to 72% in 2015 (Figure 11). This trend is however changing and in the last years a progressive switch from coal to gas in electricity and heat generation can be observed. As an impact, 2015 was the first year when global emission from coal combustion decreased significantly since the post-crisis rebound.

Emissions from electricity generation specifically increased by 45% between 2000 and 2015. At a regional level, trends over the same period differed (Figure 12). Both Annex II Europe and Annex II North America showed a decrease in total emissions from electricity generation. In Annex II North America, this was driven by improvements in i) the thermal efficiency of generation; ii) the CO₂ intensity of the fossil fuel mix (both reflecting a shift from coal towards natural gas), and iii) an increase in the share of electricity output from non-emitting sources. In Annex II Europe, the share of electricity output from fossil fuels fell 20% between 2000 and 2015 led by decreases in Italy and

Figure 11. CO₂ emissions from electricity and heat generation*, 1990-2015

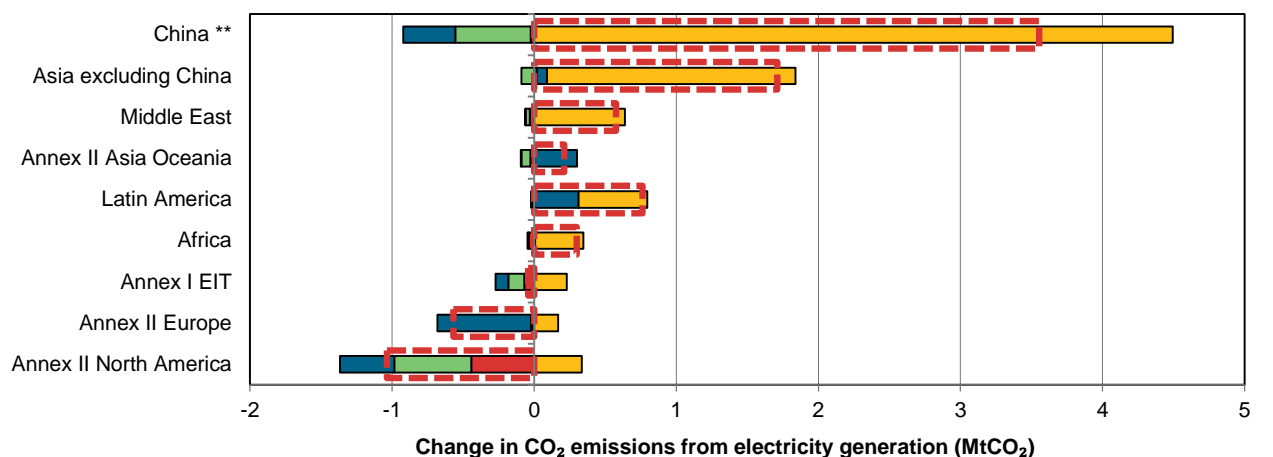


* Refers to main activity producers and autoproducers of electricity and heat.

the United Kingdom. In Italy, the share of fossil-based electricity declined significantly (2000: 81%; 2015: 61%), as output from oil products fell, while that from solar PV, wind and hydro increased. Likewise, in the United Kingdom, electricity output from coal and gas decreased, while that from wind and combustible renewables increased, lowering the share of fossil fuels in the electricity mix (2000: 75%; 2015: 68%).

By contrast, Annex II Asia Oceania showed an increase in emissions from electricity generation, primarily due to a higher share of electricity output from fossil fuels. This predominantly reflected events in Japan, where sizeable fossil-fuel-powered generating capacity was brought online in the wake of the accident at Fukushima Daiichi in 2011.

Figure 12. CO₂ emissions from electricity generation: driving factors*, 2000-2015



■ CO₂ intensity of fossil mix ■ Efficiency of generation ■ Fossil share of electricity ■ Total electricity output ■ CO₂ emissions

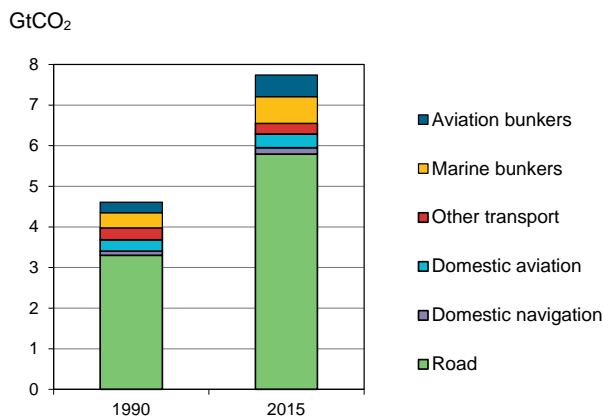
* Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec output.

** China includes Hong Kong, China.

Outside Annex I, all regions exhibited an increase in emissions from electricity generation, driven primarily by increased output. This was particularly notable in China, where total output has increased over four-fold since 2000, and in the remainder of Asia¹⁰, where output more than doubled. In both of these regions, much of the increased output was met through carbon intensive coal-fired plants. However, in China, efficiency improvements and a recently increased share of non-fossil generation (from a combination of increased output from wind, solar PV, hydro and nuclear sources) reduced emissions per unit of output.

For transport, the 68% increase since 1990 (Figure 13) was led by increasing emissions from the road sector, which accounted for three quarters of transport emissions in 2015. Despite efforts to limit emissions from international transport, between 1990 and 2015, emissions from marine and aviation bunkers grew even faster than those from road (marine: +77% aviation: +105%).

Figure 13. CO₂ emissions from transport, 1990-2015

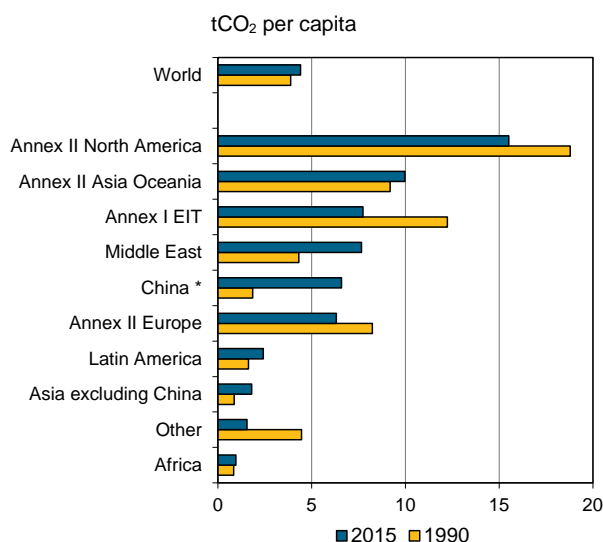


Coupling emissions with socio-economic indicators¹¹

Per-capita emission levels vary significantly across the world, highlighting the wide divergences in the way different countries and regions use energy (Figure 14). For example, among the five largest emitters, the levels

of per-capita emissions in 2015 were very diverse, ranging from 1.6 tCO₂ for India and 6.6 tCO₂ for China to 15.5 tCO₂ for the United States. On average, industrialised countries emit far larger amounts of CO₂ per capita than developing countries, with the lowest levels worldwide observed in Africa.

Figure 14. CO₂ emissions per capita by major world regions, 1990-2015



* China includes Hong Kong, China.

Globally, per-capita emissions increased by 13% between 1990 and 2015, however, contrasting trends were observed amongst the top five emitting countries, generally reducing gaps (Figure 15). China more than tripled its per-capita emissions, while India more than doubled theirs (as did some other rapidly expanding economies), reflecting strong per-capita GDP growth. Conversely, per-capita emissions decreased significantly in both the Russian Federation (-30%) and the United States (-19%), although following very different patterns. Values for Russia dramatically dropped in the early 1990s, and increased somewhat since then, while values for the United States began falling in the mid-to-late 2000s, having remained stable for many years.

For emissions per unit of GDP¹², all the five largest emitters have shown reductions between 1990 and 2015, in line with the decoupling observed globally

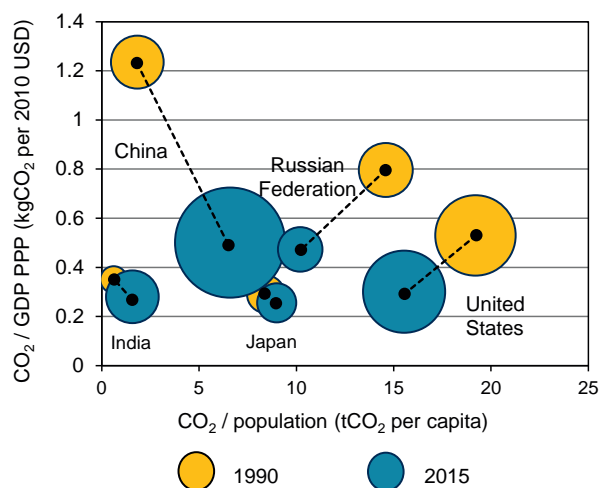
10. For the purposes of this discussion, Asia excludes China and includes Korea. Japan is included in Annex 2 Asia Oceania.

11. No single indicator can provide a complete picture of a country's CO₂ emissions performance or its relative capacity to reduce emissions. The indicators discussed here are certainly incomplete and should only be used to provide a rough description of the situation in a country.

12. Throughout this analysis, GDP refers to GDP in 2010 USD, using purchasing power parities. A note of caution is necessary concerning the indicator of CO₂ emissions per GDP. It can be very useful to measure efforts over time for one country, but has limitations when comparing countries, as it is very sensitive to the base year used for the GDP purchasing power parity (PPP).

(-31%). This trend was most pronounced for China and the Russian Federation, whose 1990 levels were significantly higher than those of other countries, and for the United States.

Figure 15. Trends in CO₂ emission intensities for the top five emitting countries*, 1990-2015



* The size of the circle represents the total CO₂ emissions from the country in that year.

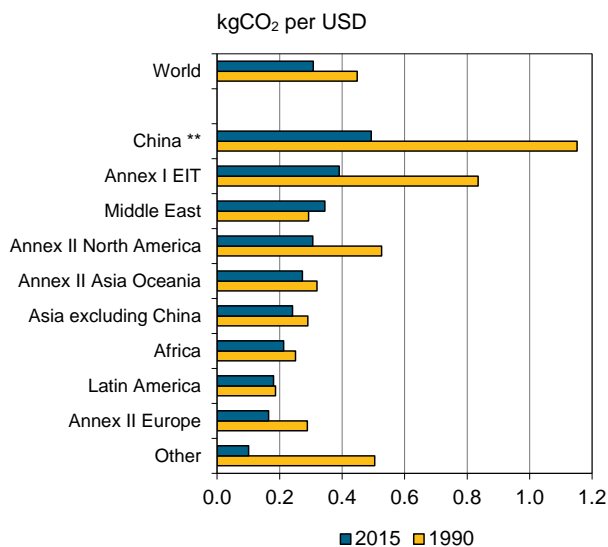
Levels of emissions per GDP also vary significantly across regions, but much less in 2015 than in 1990 (Figure 16). Although climate, economic structure and other variables can affect energy use, relatively high values of emissions per GDP indicate a potential for decoupling CO₂ emissions from economic growth, including through fuel switching away from carbon-intensive sources or from energy efficiency at all stages of the energy value chain (from raw material extraction to energy end-use).¹³

On a global level, CO₂ emissions grew by 40% between 2000 and 2015. A simple decomposition¹⁴ shows the main driving factors of the world CO₂ emissions trend. Globally, economic growth partially decoupled from energy use, as energy intensity decreased by 21% over the period. However, with a practically unchanged carbon intensity of the energy

13. The IEA's Policies and Measures Databases offer access to information on energy-related policies and measures taken or planned to reduce GHG emissions, improve energy efficiency and support renewable energy development and deployment. The online databases can be consulted at: www.iea.org/policiesandmeasures/.

14. CO₂ emissions can be decomposed into the product of four factors: population, per capita GDP, TPES/GDP, CO₂/TPES. For a more detailed description of the Kaya decomposition, see the chapter *Indicator sources and methods*.

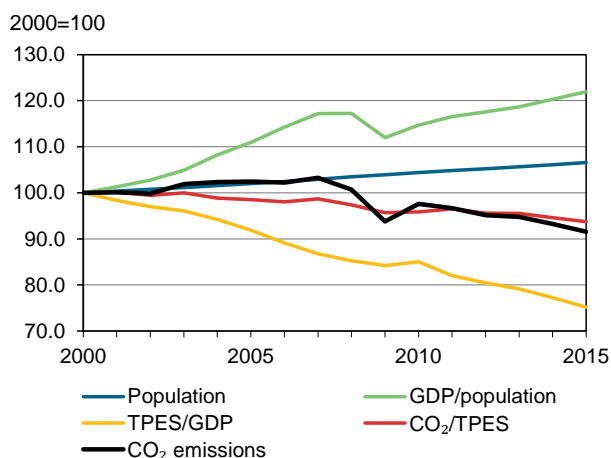
Figure 16. CO₂ emissions per GDP* by major world regions, 1990-2015



* GDP in 2010 USD, using purchasing power parities.

** China includes Hong Kong, China.

Figure 17. Annex I CO₂ emissions and drivers (Kaya decomposition)¹⁴, 2000-2015



mix¹⁵, the combined growth in population (20%) and in per capita GDP (43%) led to a significant increase in global CO₂ emissions between 2000 and 2015. However, due to differences in levels of economic, demographic and technological development and growth, emissions evolved at different rates in Annex I and non-Annex I countries and regions.

15. Also known, in its index form, as Energy Sector Carbon Intensity Index (ESCI), as in the IEA publication *Tracking Clean Energy Progress 2016*.

In Annex I countries as a whole, CO₂ emissions in 2015 were actually 8% lower than in 2000 (Figure 17). Significant decoupling of energy consumption from economic activity (TPES/GDP: -25%) acted to decrease emissions but per-capita economic output grew (GDP/population: +22%), as did population (+7%), however, the energy sector's carbon intensity (CO₂/TPES) declined mildly (-6%).

By contrast, emissions in non-Annex I countries doubled over the same period (Figure 18), as very strong growth in per-capita economic output (+90%) combined with population growth (+23%). The CO₂ intensity of the energy mix also increased (CO₂/TPES: +12%), mainly due to higher coal consumption in larger countries. However, a significant decrease in the energy intensity of the economic output (TPES/GDP: -18%) tempered those increases. A decomposition showing the effect of changes in the four driving factors on regional emissions over time is presented in Figure 19. As can be seen, trends vary greatly across countries and regions. Therefore, a

thorough understanding of the factors driving CO₂ emissions trends is essential when designing sound and effective emissions reduction policies at a national and international level.

Figure 18. Non-Annex I CO₂ emissions and drivers (Kaya decomposition)¹⁴, 1990-2015

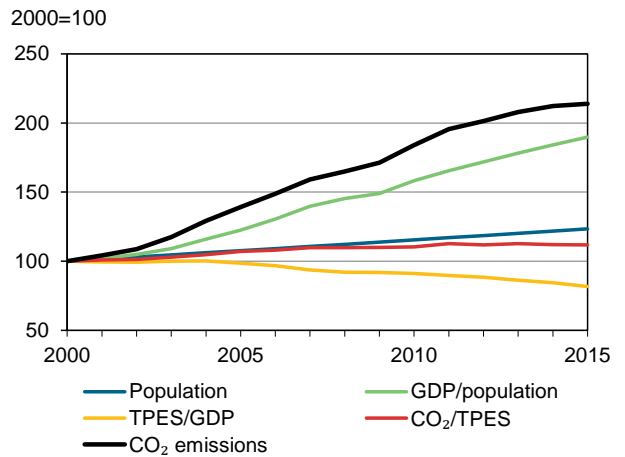
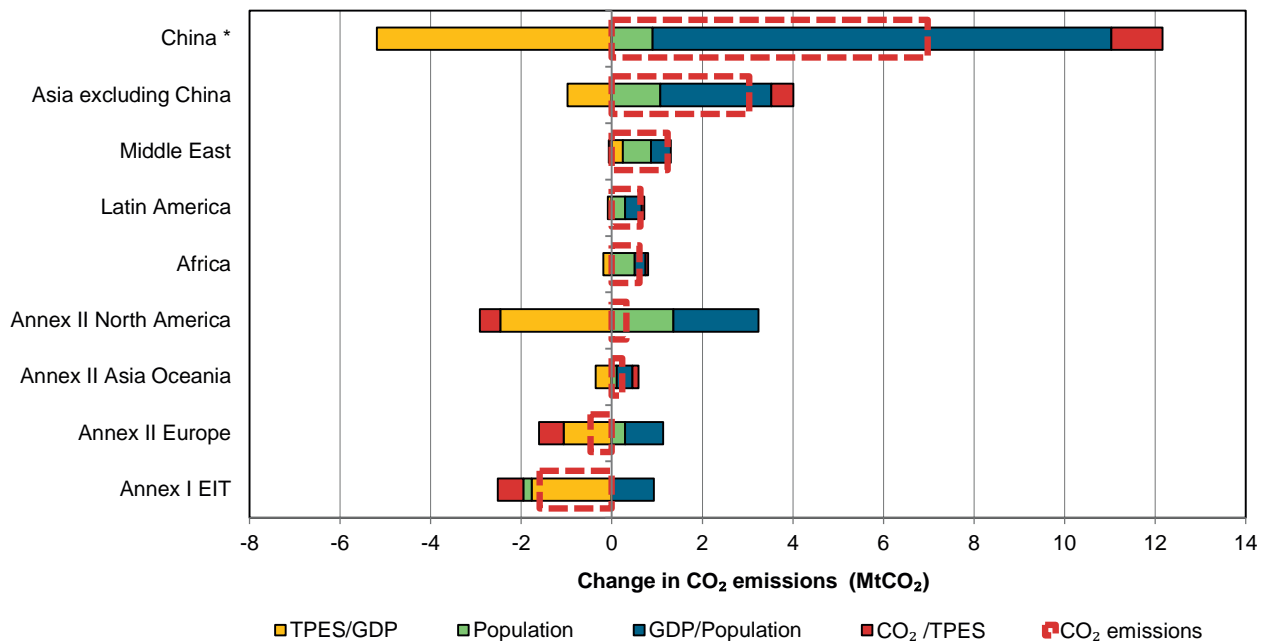


Figure 19. Global CO₂ emissions and drivers (Kaya decomposition), 1990-2015



* China includes Hong Kong, China.

Developing a low-carbon world

With the energy sector accounting for approximately two-thirds of global GHG emissions, action in the energy sector can make or break efforts to achieve global climate goals. Traditionally, industrialised countries have emitted the large majority of anthropogenic greenhouse gases (GHGs). More recently, shares of developing country emissions surpassed those of industrialised countries, and have kept rising very rapidly. To shift towards a low-carbon world, mitigation efforts must occur across all countries: decarbonising the energy supplies of industrialised countries, and shifting developing countries onto a low-carbon development path.

Timely and accurate CO₂ and GHG statistics (complemented by other energy sector metrics that provide insight into underlying transformation of the energy system) will prove central to measuring achievement of international climate targets and to informing policy makers and carbon market participants. The ability of countries to monitor and review emissions from their sources is essential in their engagement towards national and global GHG mitigation. The Capacity-building Initiative for Transparency launched at COP21 will be critical to making this happen. The IEA will also continue to support countries through provision of energy and emissions statistics, and training developed and developing country officials in policy, modelling, and energy statistics.

The Paris Agreement: International action beyond 2020

The global community adopted the historic Paris Agreement in December 2015, the first international climate agreement to extend mitigation obligations to all countries, both developed and developing. The Agreement was ratified in record pace by October 2016 and came into force 4 November 2016, just before the start of the 22nd Conference of the Parties (COP22). As of 21 August 2017, there are 195 signatories to the Paris Agreement of which 160 have also formally joined the agreement (by for example depositing their instruments of ratification).

Since the Agreement's adoption and entry into force, countries have shifted their focus to implementing their commitments under the accord, such as negotiating a "rulebook", which includes rules and guidelines for

emissions accounting and transparency of mitigation action and financial support.

Previous climate agreements: Kyoto and Cancún

The first binding commitments to reduce greenhouse gas emissions were set under the Kyoto Protocol's first commitment period (2008-12). Participating industrialised countries were required (as a group) to curb domestic emissions by about 5% relative to 1990 over this period. Thirty-eight Parties have also agreed to take commitments under a second commitment period which will run from 2013 to 2020. The Doha Amendment to the Kyoto Protocol, which would bring this second commitment period into force requires ratification by 144 countries (two-thirds of those participating); as of 9 August 2017 only 80 have ratified.

Countries comply with their Kyoto Protocol targets by reducing emissions from fossil fuel combustion, reducing emission in other sectors (e.g. land-use or direct industrial emissions), or through use of the Kyoto Protocol's "flexible mechanisms" by which industrialised countries can earn emission credits from emissions reduction projects in participating developing countries and economies in transition (EITs).

Through its flexibility mechanisms and provisions for international trading, the Kyoto Protocol has made CO₂ a tradable commodity, and has been a key driver for the development of national emissions trading schemes. However the smaller pool of countries with targets in the Kyoto Protocol's second commitment period, coupled with a large surplus of project credits carried forward from the first period, have led to low prices and project developers exiting the market.

Despite its extensive participation (192 Parties), the Kyoto Protocol is limited in its potential to address global emissions. The United States remains outside of the Protocol's jurisdiction, and developing countries do not face emissions targets. The Kyoto Protocol second commitment period targets imply action on less than 13% of global CO₂ emissions in 2014 (Table 2).

Alongside agreement of a second Kyoto Protocol commitment period, developed and developing countries submitted voluntary emission reduction pledges for 2020 under the Copenhagen Accord and Cancún Agreements. With the participating Parties producing over 80% of global emissions, these pledges have far greater coverage. Table 2 summarises the 2020 targets of the ten highest-emitting Parties, all remaining IEA member countries, and their progress towards these targets. While Annex I Parties submitted absolute

emission reduction targets (e.g. 20% below 1990 levels), non-Annex I Parties submitted “nationally appropriate mitigation actions”, many of which are intensity-based targets (e.g. reductions on a CO₂/GDP basis in China and India) or targets specifying reductions below business-as-usual scenarios (e.g. Korea, Mexico, Indonesia, South Africa). In addition, a number of these developing country targets are conditional

on international support – either requiring support to be implemented or to achieve greater levels of ambition and GHG emissions reductions. Although the ambition of these pledges is insufficient to limit temperature rise to 2°C above pre-industrial levels, the breadth of participation in mitigation commitments marked a significant improvement on the coverage of the Kyoto Protocol, and laid the groundwork for the Paris Agreement.

Table 1. 2020 greenhouse gas reduction targets of the ten largest emitters (based on 2015 emissions) and IEA member countries¹

Ten highest emitting Parties (as per IEA estimates of CO ₂ emissions from fuel combustion in 2015)							
	1990	2005	2015	2020 GHG target	base year level	2015 level	change %
	MtCO ₂						
China (incl. Hong Kong, China)	2 109	5 399	9 084	Reduce CO ₂ emissions per unit of GDP by 40-45% below 2005 levels.	0.72 kgCO ₂ / 2010 USD PPP	0.49 kgCO ₂ / 2010 USD PPP	-32%
United States²	4 802	5 702	4 998	In the range of a 17% emission reduction compared with 2005	5 702 Mt	4 997 Mt	-12%
European Union	4 028	3 921	3 201	20% averaged 2013-2020 reduction compared with 1990 under the Kyoto Protocol; 20% reduction in 2020.	4 028 Mt	3 160 Mt	-21%
India	530	1 080	2 066	Reduce the emissions intensity of GDP by 20-25% below 2005 levels.	0.30kgCO ₂ / 2010 USD PPP	0.28 kgCO ₂ / 2010 USD PPP	-6%
Russian Federation	2 163	1 482	1 469	15-25% below 1990.	2 16 Mt	1 469 Mt	-32%
Japan	1 042	1 178	1 142	3.8% below 2005.	1 18 Mt	1 142 Mt	-3%
Korea	232	458	585	<i>None</i> ³		585 Mt	
Islamic Republic of Iran	171	418	552	<i>None</i>			
Canada	420	541	549	17% below 2005.	541 Mt	549 Mt	+2%
Saudi Arabia	151	298	531	<i>None</i>			
Other IEA member countries							
	1990	2005	2015	2020 GHG target	base year level	2015 level	change %
	MtCO ₂						
Australia	260	372	381	5% reduction relative to 2000.	335 Mt	381 Mt	+14%
New Zealand	22	34	31	5% below 1990 levels.	22 Mt	31 Mt	+43%
Norway	27	34	37	Average 16% reduction 2013-2020 compared with 1990 under the Kyoto Protocol; 20% reduction in 2020.	27 Mt	37 Mt	+34%
Switzerland	41	44	37	Average 15.8% reduction 2013-2020 compared with 1990 under Kyoto Protocol; 20% reduction in 2020.	41 Mt	37 Mt	-8%
Turkey	127	217	317	<i>None</i>			

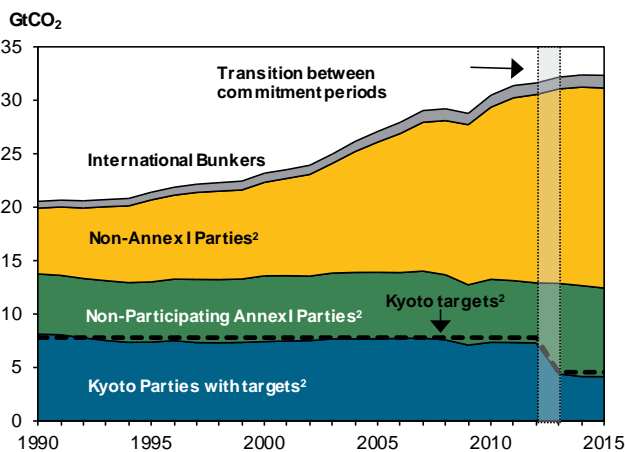
1. Voluntary targets under the Cancún Agreement, and (where indicated) second commitment period targets under the Kyoto Protocol.

2. The United States announced on 1 June 2017 its intention to withdraw from the Paris Agreement.

3. In 2016, Korea replaced its 2020 target of 30% below business-as-usual with a 2030 target as defined in its nationally-determined contribution (NDC).

Table 2. World CO₂ emissions from fuel combustion and Kyoto Protocol second commitment period targets^{1,2}

	1990 MtCO ₂	2015 MtCO ₂	% change 90-15	Kyoto Target		1990 MtCO ₂	2015 MtCO ₂	% change 90-15	Kyoto Target
KYOTO PARTIES WITH TARGETS^{1,2}	5,383.4	4,126.0	-23.4%	-19.3%²	OTHER COUNTRIES	99.8	53.2	-46.7%	
<i>Annex I Europe</i>	3,118.9	2,648.9	-15.1%		<i>Non-participating</i>				
Austria	56.3	62.1	10.4%	-20%	<i>Annex I Parties¹</i>	8,576.4	8,505.7	-0.8%	
Belgium	106.2	92.5	-13.0%	-20%	Canada	419.5	549.2	30.9%	none
Cyprus ³	3.9	5.9	51.6%	-20%	Japan	1,042.0	1,141.6	9.6%	none
Denmark	51.0	32.0	-37.3%	-20%	New Zealand	21.7	31.2	43.3%	none
Finland	53.8	42.1	-21.8%	-20%	Russian Federation	2,163.2	1,469.0	-32.1%	none
France ⁴	345.5	290.5	-15.9%	-20%	Turkey	127.5	317.2	148.9%	none
Germany	940.3	729.8	-22.4%	-20%	United States	4,802.5	4,997.5	4.1%	none
Greece	69.9	64.6	-7.6%	-20%	<i>Other Regions</i>	6,027.6	18,523.4	207.3%	none
Iceland	1.9	2.1	8.4%	-20%	Africa	529.0	1,140.4	115.6%	none
Ireland	30.1	35.3	17.3%	-20%	Middle East	535.9	1,739.7	224.6%	none
Italy	389.3	330.7	-15.0%	-20%	N-OECD Eur. & Eurasia ⁵	602.3	511.3	-15.1%	none
Luxembourg	10.7	8.8	-18.0%	-20%	Latin America ⁵	810.1	1,574.8	94.4%	none
Malta	2.3	1.6	-28.9%	-20%	Asia (excl. China) ⁵	1,441.1	4,472.7	210.4%	none
Netherlands	147.7	156.0	5.6%	-20%	China (incl. Hong Kong)	2,109.2	9,084.6	330.7%	none
Norway	27.5	36.7	33.7%	-16%					
Portugal	37.9	47.0	24.2%	-20%					
Spain	202.6	247.0	21.9%	-20%					
Sweden	52.1	37.1	-28.8%	-20%	INTL. MARINE BUNKERS	371.6	657.0	76.8%	
Switzerland	40.7	37.3	-8.4%	-15.8%	INTL. AVIATION BUNKERS	258.9	529.7	104.6%	
United Kingdom	549.3	389.8	-29.0%	-20%	WORLD	20,509.0	32,294.2	57.5%	
<i>Economies in Transition</i>	1,905.0	1,043.0	-45.2%						
Belarus	99.8	53.2	-46.7%	-12%					
Bulgaria	74.6	43.8	-41.3%	-20%					
Croatia	20.3	15.5	-23.7%	-20%					
Czech Republic	150.3	99.6	-33.8%	-20%					
Estonia	36.0	15.5	-56.8%	-20%					
Hungary	65.7	42.5	-35.3%	-20%					
Kazakhstan	237.2	225.1	-5.1%	-5%					
Latvia	18.8	6.8	-63.5%	-20%					
Lithuania	32.2	10.5	-67.3%	-20%					
Poland	344.8	282.4	-18.1%	-20%					
Romania	168.3	69.5	-58.7%	-20%					
Slovak Republic	54.8	29.4	-46.3%	-20%					
Slovenia	13.5	12.8	-5.2%	-20%					
Ukraine	688.4	189.4	-72.5%	-24%					
<i>Others</i>									
Australia	259.7	380.9	46.7%	-0.5%					
European Union	4,028.2	3,201.2	-20.5%	-20%					



1. The country composition and specific reduction targets shown in the table refer to those agreed to under the second commitment period (CP) of the Kyoto Protocol (2013-2020), as per the Doha Amendment.

2. The respective targets, gases and participating Parties differ between the first and second commitment periods of the Kyoto Protocol (CP1: 2008-2012, CP2: 2013-2020). The actual country targets apply to a basket of several greenhouse gases and allow sinks and international credits to be used for compliance. The overall "Kyoto targets" for each CP are estimated for this publication by applying the country targets to IEA data for CO₂ emissions from fuel combustion for 1990, and are shown as an indication only. These do not represent the total targets for the multi-gas baskets, and assume that the reduction targets are spread equally across all gases. The EU, its 28 Member States, and Iceland have agreed to meet the aggregate target of -20% in CP2, through "joint fulfilment" under Article 4 of the Kyoto Protocol.

3. Please refer to the chapter *Geographical Coverage*.

4. Emissions from Monaco are included with France.

5. Composition of regions differs from elsewhere in this publication to take into account countries that are not Kyoto Parties.

References

IEA (2015), *World Energy Outlook Special Briefing for COP21*, OECD/IEA, Paris.

IEA (2015), *World Energy Outlook Special Report: Energy and Climate Change*, OECD/IEA, Paris.

IPCC (2006), *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Eggleston, S., Buendia,

L., Miwa, K., Ngara, T., Tanabe, K. (eds.). IPCC-TSU NGGIP, IGES, Japan.

IPCC (2013), *Working Group I Contribution to the IPCC Fifth Assessment Report, Climate Change 2013: The Physical Science Basis, Summary for Policy Makers*, available at: www.ipcc.ch/.

UNFCCC (2015), *Adoption of the Paris Agreement*.

2. UNDERSTANDING THE IEA CO₂ EMISSIONS ESTIMATES

The importance of estimating emissions

The ultimate objective of the UNFCCC (the Convention) is the stabilisation of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Convention also calls for all Parties to commit themselves to the following objectives:

- to develop, update periodically, publish and make available to the Conference of the Parties (COP) their national inventories of anthropogenic emissions by sources and removals by sinks, of all greenhouse gases not controlled by the Montreal Protocol.
- to use comparable methodologies for inventories of GHG emissions and removals, to be agreed upon by the COP.

As a response to the objectives of the UNFCCC, the IEA Secretariat, together with the IPCC, the OECD and numerous international experts, has helped to develop and refine an internationally-agreed methodology for the calculation and reporting of national GHG emissions from fuel combustion. This methodology was published in 1995 in the *IPCC Guidelines for National Greenhouse Gas Inventories*. After the initial dissemination of the methodology, revisions were added to several chapters, and published as the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (1996 GLs)*. In April 2006, the IPCC approved the *2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 GLs)* at the 25th session of the IPCC in Mauritius. Until 2015, most Parties, as well as the IEA, still calculated their inventories using the

1996 GLs. In December 2011, Parties adopted Decision 15/CP.17 to update their reporting tables so as to implement the *2006 GLs*. The new reporting tables have been mandatory since 15 April 2015.

The IEA estimates of CO₂ emissions from fuel combustion

Energy is at the core of the greenhouse gas estimation. It is estimated that for Annex I Parties energy accounts for 82%¹ of total GHG emissions, while for the world the share is about 60%, although shares vary greatly by country. Within energy, CO₂ from fuel combustion accounts for the largest fraction, 92% for Annex I countries, once again varying depending on the economic structure of the country.

Given its extensive work in global energy data collection and compilation, the IEA is able to produce comparable estimates of CO₂ emissions from fuel combustion across countries and regions, providing a reference database for countries with more and less advanced national systems.

The estimates of CO₂ emissions from fuel combustion presented in this publication are calculated using the IEA energy data² and the default methods and emission factors from the *2006 GLs*³.

1. Based on data reported to the UNFCCC for 2012, excluding land-use, land-use change and forestry (LULUCF).

2. Published in *World Energy Statistics* and *World Energy Balances*, OECD/IEA, Paris, 2016.

3. See www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html.

Prior to the 2015 edition of this publication, the IEA used the methods and emission factors of the *Revised 1996 IPCC Guidelines*, in line with UNFCCC recommendations for the reporting under the Kyoto Protocol. The IEA implementation of the *2006 GLs* in this edition follows the decision of UNFCCC Parties to update their reporting tables and to implement the *2006 GLs* starting on 15 April 2015.

The implications of changes in methods and emissions factors on the IEA emissions estimates for this edition are discussed in the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

Data in this publication and its corresponding database may have been revised with respect to previous editions also because the IEA reviews its energy databases each year. In the light of new assessments, revisions may be made to the energy data time series for any individual country.

CO₂ emissions from fuel combustion: key concepts

The IEA uses the simplest (Tier 1) methodology to estimate CO₂ emissions from fuel combustion based on the *2006 GLs*. The computation follows the concept of conservation of carbon, from the fuel combusted into CO₂. While for the complete methodology the reader should refer to the full IPCC documents, a basic description follows.

Generally, the Tier 1 estimation of CO₂ emissions from fuel combustion for a given fuel can be summarised as follows:

$$\text{CO}_2 \text{ emissions from fuel combustion} \\ \text{CO}_2 = \text{Fuel consumption} * \text{Emission factor}$$

where:

Fuel consumption = amount of fuel combusted;
Emission factor = default emission factor

Emissions are then summed across all fuels and all sectors of consumption to obtain national totals. A more detailed explanation of the step by step calculation is presented in the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

IEA estimates vs. UNFCCC submissions

Based on the IEA globally collected energy data, the IEA estimates of CO₂ emissions from fuel combustion are a global database obtained following harmonised definitions and comparable methodologies across countries. They do not represent an official source for national submissions, as national administrations should use the best available country-specific information to complete their emissions reporting.

The IEA CO₂ estimates can be compared with those reported by countries to the UNFCCC Secretariat to highlight possible problems in methods, input data or emission factors. Still, care should be used in interpreting the results of any comparison since the IEA estimates may differ from a country's official submission for many reasons.

For most Annex II countries, the two calculations are expected to be within 5-10%, depending on the coverage of the fuel combustion sector in the national inventory. For some EIT and non-Annex I countries, differences may be larger. If the underlying energy data are different, more work is needed on the collecting and reporting of energy statistics.

In case of systematic biases in the energy data or emission factors, emission trends will usually be more reliable than the absolute emission levels. By comparing trends in the IEA estimates with trends in emissions as reported to the UNFCCC, it should be possible to identify definition problems or methodological differences.

Some of the reasons for these differences are:

- **The IEA uses a Tier 1 method to compute emissions estimates.**

For the calculation of CO₂ emissions from fuel combustion, the IEA uses a Tier 1 method. Countries may be using a more sophisticated Tier 2 or Tier 3 method that takes into account more detailed country-specific information available (e.g. on different technologies or processes).

- **Energy activity data based on IEA energy balances may differ from those used for the UNFCCC calculations.**

Countries often have several "official" data sources such as a Ministry, a Central Bureau of Statistics, a nationalised electricity company, etc. Data can also be

collected from the energy suppliers, the energy consumers or customs statistics. The IEA Secretariat tries to collect the most accurate data, but does not necessarily have access to the complete data set that may be available to national experts calculating emission inventories for the UNFCCC. In addition to different sources, the methodology used by the national bodies providing the data to the IEA and to the UNFCCC may differ. For example, general surveys, specific surveys, questionnaires, estimations, combined methods and classifications of data used in national statistics and in their subsequent reclassification according to international standards may result in different series.

- **The IEA uses average net calorific values for oil products.**

To transform fuel consumption data from physical units to energy units, the IEA uses an average net calorific value (NCV) for each secondary oil product. These NCVs are region-specific and constant over time. Country-specific NCVs that can vary over time are used for NGL, refinery feedstocks and additives. Crude oil NCVs are further split into production, imports, exports and average. Different coal types have specific NCVs for production, imports, exports, inputs to main activity power plants and coal used in coke ovens, blast furnaces and industry, and can vary over time for each country.

Country experts may have more detailed data on calorific values available when calculating the energy content of the fuels. This in turn could produce different values than those of the IEA.

- **The IEA uses average carbon content values.**

The IEA uses the default carbon content values given in the *2006 GLs*. Country experts may have better information available, allowing them to use country-specific values.

- **The IEA cannot allocate emissions from auto-producers into the end-use sectors.**

The *2006 GLs* recommend that emissions from auto-production should be included with emissions from other fuel use by end-consumers. At the same time, the emissions from the autoproduction of electricity and heat should be excluded from the energy transformation source category to avoid double counting. The IEA is not able to allocate the fuel use from auto-producers between industry and *other*. Therefore, this publication shows a category called “Unallocated auto-producers”. However, this should not affect the total emissions for a country.

- **Military emissions may be treated differently.**

According to the *2006 GLs*, military emissions should be reported in Source/Sink Category 1 A 5, *Non-Specified*. Previously, the IEA questionnaires requested that warships be included in international marine bunkers and that the military use of aviation fuels be included in domestic air. All other military use should have been reported in *non-specified other*.

At the IEA/Eurostat/UNECE Energy Statistics Working Group meeting (Paris, November 2004), participants decided to harmonise the definitions used to collect energy data on the joint IEA/Eurostat/UNECE questionnaires with those used by the IPCC to report GHG inventories. As a result, starting in the 2006 edition of this publication, all military consumption should be reported in *non-specified other*. Sea-going versus coastal is no longer a criterion for splitting international and domestic navigation.

However, it is not clear whether countries are reporting on the new basis, and if they are, whether they will be able to revise their historical data. The IEA has found that in practice most countries consider information on military consumption as confidential and therefore either combine it with other information or do not include it at all.

- **The IEA estimates include all CO₂ emissions from fuel combustion. Countries may have included parts of these emissions in the IPCC category industrial processes and product use.**

Although emissions totals would not differ, the allocation to the various sub-totals of a national inventory could. National GHG inventories submitted to the UNFCCC divide emissions according to source categories. Two of these IPCC Source/Sink Categories are energy, and industrial processes and product use. Care must be taken not to double count emissions from fuel combustion that occur within certain industrial processes (e.g. iron and steel). The IEA estimates in this publication include all the CO₂ emissions from fuel combustion, while countries are asked to report some of them within the industrial processes and product use category under the *2006 GLs*. See a more detailed discussion in the chapter *IEA Estimates: Changes under the 2006 IPCC Guidelines*.

- **The units may be different.**

The *2006 GLs* ask that CO₂ emissions be reported in Gg of CO₂ (1 Gg = 1 kilotonne). A million tonnes of CO₂ is equal to 1 000 Gg of CO₂, so to compare the numbers in this publication with national inventories expressed in Gg, the IEA emissions must be multiplied by 1 000.

Inventory quality: identifying key categories

The *IPCC Guidelines* allow Parties to the UNFCCC to prepare and periodically update national inventories that are accurate, complete, comparable and transparent. Inventory quality is an important issue since countries are now implementing legally-binding commitments.

To reduce the overall inventory uncertainty in a cost-effective way, it is useful to identify those categories (key categories⁴) that have the greatest contribution to overall inventory uncertainty. By identifying key categories in the national inventory, inventory compilers can prioritise their efforts and improve their overall estimates. It is good practice for each country to identify its national key categories in a systematic and objective manner. Such a process will lead to improved inventory quality, as well as greater confidence in the estimates that are developed.

The *2006 GLs* identify a key category as one that is prioritised within the national inventory system because its estimate has a significant influence on a country's total inventory of greenhouse gases in terms of the absolute level, the trend, or the uncertainty in emissions and removals.

For a more complete description of the IPCC methodology for determining key categories, see Volume 1, Chapter 4 of the *2006 GLs*.

The IEA has disaggregated the key category analysis to the same level of detail presented in the country tables of this publication. For each country, the nine largest categories are shown, split by the various fuel types: coal, oil, gas and other.

For the level assessment, the CO₂ emissions from fuel combustion as calculated by the IEA are supplemented, where possible, by the figures submitted by the Annex I Parties to the UNFCCC in their latest GHG inventory submissions for CO₂ (fugitive emissions), CH₄, N₂O, HFCs, PFCs and SF₆, not taking into account CO₂ emissions/removals from land use, land use change and forestry.⁵

For the non-Annex I Parties, CO₂ emissions from fuel combustion are taken from IEA estimates, and are

supplemented by data for other sources and provided by JRC and PBL (see Part III for further information). As this database only covers emission to 2014, the 2015 level of GHG emissions was extrapolated based on the growth rate from 2012 to 2014 of each source and gas.

Notes on tables and graphs

This publication presents for each country and regional aggregate a set of six graphs and three tables with key indicators (Part II, Country Tables). A selection of key indicators is also presented in summary tables for country-to-country comparison (Part II, Summary Tables). An overall description of the various

Table 1: Key indicators

Row 1: CO₂ *fuel combustion* presents total CO₂ emissions from fuel combustion as calculated using the IEA energy balances and the methodologies outlined in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. For notes on methods and sources, see the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

Row 2: Share of World CO₂ from fuel combustion presents national/regional CO₂ emissions from fuel combustion divided by World CO₂ emissions from fuel combustion, expressed as a percentage.

Row 3: TPES presents the Total Primary Energy Supply, calculated as production + imports - exports - international marine bunkers - international aviation bunkers ± stock changes.

Row 4: GDP presents the Gross Domestic Product in 2010 US dollars using exchange rates. For notes on methods and sources, please see the chapter on Indicator sources and methods.

Row 5: GDP PPP presents the Gross Domestic Product in 2010 US dollars using purchasing power parities. For notes on methods and sources, see the chapter on Indicator sources and methods.

Row 6: Population. For notes on sources see the chapter on Indicator sources and methods.

Row 7: CO₂/TPES presents the carbon intensity of the energy mix. For notes on methods see the chapter on Indicator sources and methods.

Row 8: CO₂/GDP presents the carbon intensity of the economy, using exchange rates. For notes on methods and sources, see the chapter on Indicator sources and methods.

4. In the *2000 IPCC Good Practice Guidance for National Greenhouse Gas Inventories*, the concept was named 'key source categories'.

5. As recommended in the *IPCC Good Practice Guidance*.

Row 9: CO₂/GDP PPP presents the carbon intensity of the economy, using purchasing power parities. For notes on methods and sources, see the chapter on Indicator sources and methods.

Row 10: CO₂/population presents the per capita CO₂ emissions, based on CO₂ fuel combustion. For notes on sources, see the chapter on Indicator sources and methods.

Row 11: Share of electricity output from fossil fuels presents electricity output from fossil fuels divided by total electricity output, expressed as a percentage. For notes on sources, see the chapter on Indicator sources and methods.

Row 12: CO₂/kWh of electricity presents CO₂ emissions from total fossil fuel inputs to electricity generation divided by total electricity output.

Row 13-17: CO₂ emissions and drivers - Kaya decomposition present indices of CO₂ emissions (CO₂ fuel combustion), population, GDP/population, TPES/GDP and CO₂/TPES, (based on GDP PPP time series). It represents the decomposition of CO₂ emissions into drivers (Kaya identity) explained in the chapter on Indicator sources and methods.

Table 2: CO₂ emissions by sector

Row 1: *CO₂ fuel combustion*: as in Row 1 of Table 1.

Row 2: Electricity and heat generation contains the sum of emissions from main activity producers and autoproducers of electricity and/or heat. Emissions from own on-site use of fuel are included.

Main activity producers are defined as those undertakings whose primary activity is to supply the public. They may be publicly or privately owned. This corresponds to IPCC Source/Sink Category 1 A 1 a.

Autoproducers are defined as undertakings that generate electricity and/or heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned. Under the *2006 IPCC Guidelines*, these emissions would normally be distributed between industry, transport and *other*.

Row 3: *Other energy industry own use* contains emissions from fuel combusted in oil refineries, for the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. This corresponds to the IPCC Source/Sink Categories 1 A 1 b and 1 A 1 c.

According to the *2006 IPCC Guidelines*, emissions from coke inputs to blast furnaces, may be reported

under the source/sink category industrial processes and product use rather than energy. In the reduction of iron in a blast furnace through the combustion of coke, the primary purpose of the coke oxidation is to produce pig iron and the emissions can be considered as resulting from an industrial process. In the IEA estimations, emissions from energy industry own use in blast furnaces have been included in this category. Care must be taken not to double count these emissions in both energy, and industrial processes and product use.

Row 4: *Manufacturing industries and construction* contains the emissions from combustion of fuels in industry. The IPCC Source/Sink Category 1 A 2 includes these emissions. However, in the *2006 IPCC Guidelines*, the IPCC category also includes emissions from industry autoproducers that generate electricity and/or heat. The IEA data are not collected in a way that allows the energy consumption to be split by specific end-use and therefore, in this publication autoproducers are excluded from this category. See Row 2, *Electricity and heat generation*.

According to the 2006 IPCC GLs, emissions resulting from the combustion of certain fuels in specific sectors (see below) may be reported under industrial processes and product use rather than energy. However, in IEA estimates, these emissions have been included in this category. Care must be taken not to double count these emissions in both energy, and industrial processes and product use.

- Coke oven coke deliveries to the iron and steel and non-ferrous metals sectors.
- Coke oven gas, blast furnace gas and other recovered gases deliveries to iron and steel.

Similarly, under the 2006 IPCC GLs coal tar deliveries to the chemical and petrochemical, and construction sectors may be completely excluded from energy sector emissions calculations, as they are deemed to be destined for non-energy use. However, where these fuels have been reported under energy-use they have been included in IEA estimates.

Row 5: *Transport* contains emissions from the combustion of fuel for all transport activity, regardless of the sector, except for *international marine bunkers* and *international aviation bunkers*, which are not included in *transport* emissions at a national or regional level (except for World transport emissions). This includes domestic aviation, domestic navigation, road, rail and pipeline transport, and corresponds to IPCC Source/Sink Category 1 A 3. The IEA data are not collected in a way that allows the autoproducer consumption to be split by specific end-use and therefore, in this

publication autoproducers are excluded from this category. See Row 2, *Electricity and heat generation*.

Note: Starting in the 2006 edition, military consumption previously included in *domestic aviation* and in *road* should be reported under *non-specified other*. See the section *IEA estimates vs. UNFCCC submissions* earlier in the chapter, for further details.

Row 6: *Road* contains the emissions arising from fuel use in road vehicles, including the use of agricultural vehicles on highways. This corresponds to the IPCC Source/Sink Category 1 A 3 b.

Row 7: *Other* contains the emissions from commercial/institutional activities, agriculture/forestry, fishing, residential and other emissions not specified elsewhere that are included in the IPCC Source/Sink Categories 1 A 4 and 1 A 5. In the *2006 IPCC Guidelines*, the category also includes emissions from autoproducers in commercial/public services, residential and agriculture that generate electricity and/or heat. The IEA data are not collected in a way that allows the energy consumption to be split by specific end-use, and therefore, in this publication autoproducers are excluded from this category. See Row 2, *Electricity and heat generation*.

Row 8: *Residential* contains all emissions from fuel combustion in households. This corresponds to IPCC Source/Sink Category 1 A 4 b.

Row 9: *Services* (i.e. commercial and public services) contains emissions from all activities of ISIC Rev. 4 Divisions 33, 36-39, 45-47, 52, 53, 55-56, 58-66, 68-75, 77-82, 84 (excluding Class 8422), 85-88, 90-96 and 99.

Row 10: *International marine bunkers* contains emissions from fuels burned by ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/international split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded. Emissions from international marine bunkers should be excluded from the national totals. This corresponds to IPCC Source/Sink Category 1 A 3 d i.

Row 11: *International aviation bunkers* contains emissions from fuels used by aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline. Emissions from international aviation

should be excluded from the national totals. This corresponds to IPCC Source/Sink Category 1 A 3 a i.

Table 3: Key categories for CO₂ emissions from fuel combustion

See section *Inventory quality: identifying key categories* earlier in this chapter for methodological explanations. This table only shows the nine largest key sources of CO₂ from fuel combustion. As a result, in most cases the cumulative contribution will not be 95% as recommended in the *Good Practice Guidance*. Key categories from fugitive emissions; industrial processes and product use; agriculture, forestry and other land use; and waste are not shown. The percentage of CO₂ emissions from fuel combustion in total GHG emissions is included as a memo item at the bottom of the table.

Figure 1: CO₂ emissions by fuel

Based on CO₂ fuel combustion emissions. The product *coal* refers to the aggregate of coal, peat and oil shale. The product *gas* refers to natural gas. The product *other* includes industrial waste and non-renewable municipal waste.

Figure 2: CO₂ emissions by sector

Based on CO₂ fuel combustion emissions. The sector *other* includes emissions from commercial/public services, agriculture/forestry and fishing. Emissions from unallocated autoproducers are included in *Electricity and heat*.

Figure 3: Electricity generation by fuel

The product *other* includes geothermal, solar, wind, combustible renewables and waste, etc. Electricity generation includes both main activity producer and autoproducer electricity.

Figure 4: CO₂ from electricity generation: driving factors

Presents the change in CO₂ emissions from electricity generation over time, for four time periods, as the sum of the change in four driving factors: CO₂ intensity of the fossil fuel mix, fossil share of electricity, thermal efficiency of fossil fired generation, and total electricity output. For notes on methodologies and sources, see the chapter on Indicator sources and methods.

Figure 5: Changes in selected indicators

Presents average annual changes, computed as compounded annual growth rates, for three different periods, for the following variables: CO₂ emissions,

CO₂/TPES, CO₂/GDP PPP, CO₂/population. For notes on methodologies and sources, see the chapter on Indicator sources and methods.

Figure 6: Total CO₂ emissions and drivers

Presents indices of CO₂ emissions and of four drivers of emission trends, as identified in the Kaya identity: population, GDP/population, TPES/GDP, CO₂/TPES (1990=100 unless otherwise specified), based on GDP PPP time series. The quantitative impact of each driver on total CO₂ emissions over time is also presented. This has been calculated using the logarithmic mean divisia (LMDI) method as described in the section Drivers of electricity generation emissions trends earlier in the chapter. For methodology and notes on sources, see the chapter on Indicator sources and methods.

Note: in the tables and figures presented in this publication, peat and oil shale are aggregated with *coal*; the product *gas* refers to natural gas; and with the exception of figure 4, the product *other* includes industrial waste and non-renewable municipal waste.

Country notes

Detailed country notes and sources for the underlying energy data are available in the IEA World Energy balances publication⁶.

Armenia

Data for Armenia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Azerbaijan

Data for Azerbaijan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Bangladesh

Data for Bangladesh are reported on a fiscal year basis. Data for 2015 are for 1 July 2015 – 30 June 2016.

Belarus

Data for Belarus are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Bosnia and Herzegovina

Data for Bosnia and Herzegovina are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Botswana

Data for Botswana are available starting in 1995. Prior to that, they are included in Other Africa.

Bulgaria

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Bulgaria is allowed to use 1988 as the base year.

Cambodia

Data for Cambodia are available starting in 1995. Prior to that, they are included in Other Asia.

Chile

Data start in 1971.

Croatia

Data for Croatia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Curaçao

The Netherlands Antilles was dissolved on 10 October 2010 resulting in two new “constituent countries” (Curaçao and Sint Maarten) with the other islands joining The Netherlands as ‘special municipalities’. However, due to lack of detailed data the IEA Secretariat’s data and estimates under the “Curaçao” still refer to the whole territory of the Netherlands Antilles as it was known prior to 10 October 2010 up to the end of 2011. Data refer only to the island of Curaçao from 2012. The other islands of the former Netherlands Antilles are added to Other Non-OECD Americas from 2012.

Czech Republic

Data start in 1971.

Democratic Republic of the Congo

For data in the GHG tables, The high GHG / GDP PPP ratio is due to high levels of forest fires and subsequent post-burn decay.

Egypt

Data for Egypt are reported on a fiscal year basis. Data for 2015 are for 1 July 2015 – 30 June 2016.

6. http://wds.iea.org/wds/pdf/WORLDBAL_Documentation.pdf

Eritrea

Data for Eritrea are available from 1992. Prior to that, they are included in Ethiopia.

Estonia

Data start in 1990. Prior to that, they are included within Former Soviet Union.

Note: Estonia joined the IEA in May 2014.

Ethiopia

Ethiopia energy data include Eritrea from 1971 to 1991. From 1992 onwards the two countries are reported separately.

Former Yugoslav Rep. of Macedonia

Data for Former Yugoslav Rep. of Macedonia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Georgia

Data for Georgia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Hungary

Data start in 1965.

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Hungary is allowed to use average 1985-1987 as the base year.

India

Data are reported on a fiscal calendar year basis. Data for 2015 are for 1 April 2015 – 31 March 2016.

Islamic Republic of Iran

Data are reported according to the Iranian calendar year. Data for 2015 correspond to 20 March 2015 – 19 March 2016.

Kazakhstan

Data for Kazakhstan are available starting in 1990. Prior to that they are included in Former Soviet Union.

Korea

Data start in 1971.

Kosovo

Data for Kosovo are available starting in 2000. From 1990-1999, data for Kosovo are included in Serbia. Prior to 1990, they are included in Former Yugoslavia.

For data in the GHG tables, from 2000 onwards, all emissions other than CO₂ from fuel combustion are included in Serbia.

Kyrgyzstan

Data for Kyrgyzstan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Latvia

Data for Latvia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Latvia became an OECD Member in July 2016. Accordingly, Latvia appears in the list of OECD members and is not included in the non-OECD aggregates for data from 1990, starting with the 2017 edition.

Lithuania

Data for Lithuania area available starting in 1990. Prior to that, they are included in Former Soviet Union.

Malta

At its fifteenth session, the Conference of the Parties decided to amend Annex I to the Convention to include Malta (Decision 3/CP.15). The amendment entered into force on 26 October 2010.

Mexico

Data start in 1971.

Moldova

Data for the Republic of Moldova are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Mongolia

Data for Mongolia are available starting in 1985. Prior to that, they are included in Other Asia.

For data in the GHG tables, the high GHG / GDP PPP ratio for Mongolia is due to high levels of peat decay.

Montenegro

Data for Montenegro are available starting in 2005. From 1990 to 2004, data for Montenegro are included in Serbia. Prior to 1990, data are included in Former Yugoslavia.

For data in the GHG tables, from 2005 onwards, all emissions other than CO₂ from fuel combustion are included in Serbia.

Namibia

Data for Namibia are available starting in 1991. Prior to that, they are included in Other Africa.

Nepal

Data for Nepal are reported on a fiscal year basis. Data for 2015 are for 16 July 2015 - 15 July 2016.

Niger

Data for Niger are available starting in 2000. Prior to that, they are included in Other Africa.

For data in the GHG tables, for 1990 and 1995, Other Africa includes Niger for all CO₂ emissions from fuel combustion.

Norway

Discrepancies between Reference and Sectoral Approach estimates (as presented in the database) and the difference in the resulting growth rates arise from statistical differences between supply and consumption data for oil and natural gas. For Norway, supply of these fuels is the residual of two very large and opposite terms, production and exports.

Poland

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Poland is allowed to use 1988 as the base year.

Romania

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Romania is allowed to use 1989 as the base year.

Russia

Data for Russian Federation are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Serbia

Data for Serbia are available starting in 1990. Prior to that, they are included in Former Yugoslavia. Serbia includes Kosovo from 1990 to 1999 and Montenegro from 1990 to 2004.

For data in the GHG tables, Serbia includes Kosovo for all emissions other than CO₂ from fuel combustion from 2000 onwards, and Montenegro for all emissions other than CO₂ from fuel combustion from 2005 onwards.

Singapore

Due to Singapore's large trade volume in comparison to its final consumption, a slight misalignment of trade figures can have a significant impact on the Energy balance of Singapore. As a result, large discrepancies between the Reference and Sectoral Approach estimates (as presented in the database) arise from statistical differences between supply and consumption of oil and oil products.

The IEA Secretariat, the Energy Market Authority and the National Climate Change Secretariat (NCCS) are working closely together on improving data quality for Singapore. Efforts are continuing on this project, therefore breaks in time series between 2008 and 2009 and differences in trends when compared to previous publications may occur for some products.

Slovenia

Data for Slovenia are available from 1990. Prior to that, they are included in Former Yugoslavia in the full publication.

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Slovenia is allowed to use 1986 as the base year.

South Africa

Large differences between the Reference and Sectoral Approach estimates (as presented in the database) are due to losses associated with coal-to-liquid and to a lesser extent gas-to-liquid transformation.

South Sudan

South Sudan became an independent country on 9 July 2011. Data for South Sudan are available from 2012. Prior to 2012, they are included in Sudan.

For data in the GHG tables, data for South Sudan is included in Sudan for all years.

Sudan

South Sudan became an independent country on 9 July 2011. Data for South Sudan are available from 2012. Prior to 2012, they are included in Sudan.

For data in the GHG tables, data for South Sudan is included in Sudan for all years.

Suriname

Data for Suriname are available from 2000. Prior to 2000, data for Suriname are presented in Other non-OECD Americas.

For data in the GHG tables, for 1990 and 1995, Other non-OECD Americas includes Suriname for all CO₂ emissions from fuel combustion.

Tajikistan

Data for Tajikistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Turkmenistan

Data for Turkmenistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Ukraine

Data for Ukraine are available starting in 1990. Prior to that, they are included in Former Soviet Union.

United Kingdom

Shipments of coal and oil to the Channel Islands and the Isle of Man from the United Kingdom are not classed as exports. Supplies of coal and oil to these islands are, therefore, included as part of UK supply. Exports of natural gas to the Isle of Man are included with the exports to Ireland.

Uzbekistan

Data for Uzbekistan are available starting in 1990. Prior to that, data are included in Former Soviet Union.

Zambia

For data in the GHG tables, the high GHG / GDP PPP ratio is due to high levels of forest fires and subsequent post-burn decay.

3. GEOGRAPHICAL COVERAGE

In this publication:

World includes OECD Total; Africa; Non-OECD Americas; Non-OECD Asia (excluding China); China (People's Republic of China and Hong Kong, China); Non-OECD Europe and Eurasia; Middle East; World aviation bunkers and World marine bunkers. It is also the sum of Africa, Americas, Asia, Europe, Oceania, World aviation bunkers and World marine bunkers.

Africa includes Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; the Republic of the Congo (Congo); Côte d'Ivoire; the Democratic Republic of the Congo; Djibouti; Egypt; Equatorial Guinea; Eritrea; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Réunion; Rwanda; Sao Tome and Principe; Senegal; the Seychelles; Sierra Leone; Somalia; South Africa; South Sudan (from 2012); Sudan; Swaziland; the United Republic of Tanzania (Tanzania); Togo; Tunisia; Uganda; Zambia; Zimbabwe.

Americas includes Antigua and Barbuda; Argentina; Aruba; the Bahamas; Barbados; Belize; Bermuda; the Plurinational State of Bolivia (Bolivia); Bonaire (from 2012); the British Virgin Islands; Brazil; Canada; the Cayman Islands; Chile; Colombia; Costa Rica; Cuba; Curaçao⁷; Dominica; the Dominican Republic;

7. The Netherlands Antilles was dissolved on 10 October 2010 resulting in two new 'constituent countries' (Curaçao and Sint Maarten) with the other islands joining The Netherlands as "special municipalities". However, due to lack of detailed data the IEA Secretariat's data and estimates under the "Netherlands Antilles" still refer to the whole territory of the Netherlands Antilles as it was known prior to 10 October 2010 up to the end of 2011. Data refer only to the island of Curaçao from 2012. The other islands of the former Netherlands Antilles are added to Other non-OECD Americas from 2012.

Ecuador; El Salvador; the Falkland Islands (Malvinas); Guatemala; French Guiana; Grenada; Guadeloupe; Guyana; Haiti; Honduras; Jamaica; Martinique; Mexico; Montserrat; Nicaragua; Panama; Paraguay; Peru; Puerto Rico (for natural gas and electricity)⁸; Saba (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Eustatius (from 2012); Sint Maarten (from 2012); Suriname; Trinidad and Tobago; the Turks and Caicos Islands; the United States; Uruguay; the Bolivarian Republic of Venezuela (Venezuela).

Asia (from 1990) includes Afghanistan; Armenia; Azerbaijan; Bahrain; Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the People's Republic of China; Cyprus⁹; Georgia; Hong Kong, China; India; Indonesia; the Islamic Republic of Iran; Iraq; Israel¹⁰; Japan; Jordan; the Democratic People's Republic of Korea; Korea; Kazakhstan; Kuwait; Kyrgyzstan; Lao People's Democratic Republic; Lebanon; Macau, China; Malaysia; the Maldives; Mongolia; Myanmar; Nepal;

8. Natural gas and electricity data for Puerto Rico are included under Other non-OECD Americas. Oil statistics as well as coal trade statistics for Puerto Rico are included under the United States.

9. Note by Turkey:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union member states of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

10. 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.

Oman; Pakistan; the Philippines; Qatar; Saudi Arabia; Singapore; Sri Lanka; the Syrian Arab Republic; Tajikistan; Chinese Taipei; Thailand; Timor-Leste; Turkey; Turkmenistan; the United Arab Emirates; Uzbekistan; Viet Nam; and Yemen.

Europe (from 1990) includes Albania; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; the Czech Republic; Denmark; Estonia; Finland; the Former Yugoslav Republic of Macedonia; France; Germany; Gibraltar; Greece; Hungary; Iceland; Ireland; Italy; Kosovo¹¹; Latvia; Lithuania; Luxembourg; Malta; the Republic of Moldova (Moldova); Montenegro; the Netherlands; Norway; Poland; Portugal; Romania; the Russian Federation; Serbia¹²; the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Ukraine; the United Kingdom.

Oceania includes Australia; New Zealand; Cook Islands; Fiji; French Polynesia; Kiribati; New Caledonia; Palau; Papua New Guinea; Samoa; the Solomon Islands; Tonga; Vanuatu.

The **International Energy Agency (IEA)** includes Australia; Austria; Belgium; Canada; the Czech Republic; Denmark; Estonia¹³; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Japan; Korea; Luxembourg; the Netherlands; New Zealand; Norway; Poland; Portugal; the Slovak Republic; Spain; Sweden; Switzerland; Turkey; the United Kingdom; the United States.

The **IEA and Accession/Association countries** includes: IEA member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia¹², Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States; Accession countries: Chile and Mexico; Association countries: the People's Republic of China; India; Indonesia; Morocco; Singapore; Thailand.

11. This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.

12. Serbia includes Montenegro until 2004 and Kosovo until 1999.

13. Estonia is included starting in 1990. Prior to 1990, data for Estonia are included in Former Soviet Union.

The **Organisation for Economic Co-Operation and Development (OECD)** includes Australia; Austria; Belgium; Canada; Chile; the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel¹⁴; Italy; Japan; Korea; Latvia¹⁵; Luxembourg; Mexico; the Netherlands; New Zealand; Norway; Poland; Portugal; the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; the United Kingdom; the United States.

OECD Americas includes Canada; Chile; Mexico; the United States.

OECD Asia Oceania includes Australia; Israel; Japan; Korea; New Zealand.

OECD Europe includes Austria; Belgium; the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Latvia¹⁵; Luxembourg; the Netherlands; Norway; Poland; Portugal; the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; the United Kingdom.

Estonia, Latvia and Slovenia are included starting in 1990. Prior to 1990, Estonia and Latvia are included in Former Soviet Union and Slovenia is included in Former Yugoslavia.

Within the **OECD**:

- **Australia** excludes the overseas territories;
- **Denmark** excludes Greenland and the Faroe Islands, except prior to 1990, where data on oil for Greenland were included with the Danish statistics. The administration is planning to revise the series back to 1974 to exclude these amounts;
- **France** includes Monaco and excludes the following overseas departments: Guadeloupe; French Guiana; Martinique; Mayotte; and Réunion; and collectivities: New Caledonia; French Polynesia; Saint Barthélemy; Saint Martin; Saint Pierre and Miquelon; and Wallis and Futuna;
- **Germany** includes the new federal states of Germany from 1970 onwards;

14. 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.

15. Latvia became an OECD member in July 2016. Accordingly, Latvia appears in the list of OECD members and is included in the zone aggregates for data from 1990, starting with the 2017 edition. Prior to 1990, data for Latvia are included in Former Soviet Union.

- 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;
- **Italy** includes San Marino and the Holy See;
- **Japan** includes Okinawa;
- **Netherlands** excludes Suriname, Aruba and the other former Netherlands Antilles (Bonaire, Curaçao, Saba, Saint Eustatius and Sint Maarten);
- **Portugal** includes the Azores and Madeira;
- **Spain** includes the Canary Islands;
- **Switzerland** includes Liechtenstein for oil data; data for other fuels do not include Liechtenstein;
- Shipments of coal and oil to the Channel Islands and the Isle of Man from the **United Kingdom** are not classed as exports. Supplies of coal and oil to these islands are, therefore, included as part of UK supply. Exports of natural gas to the Isle of Man are included with the exports to Ireland;
- **United States** includes the 50 states and the District of Columbia but generally excludes all territories, and all trade between the U.S. and its territories. Oil statistics include Guam, Puerto Rico⁸ and the United States Virgin Islands; trade statistics for coal include international trade to and from Puerto Rico and the United States Virgin Islands.

Non-OECD Europe and Eurasia includes Albania; Armenia; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Cyprus¹⁶; the Former Yugoslav Republic of Macedonia; Georgia; Gibraltar; Kazakhstan; Kosovo¹¹; Kyrgyzstan; Lithuania; Malta; the Republic of Moldova (Moldova); Montenegro; Romania; the Russian Federation; Serbia¹²; Tajikistan; Turkmenistan; Ukraine; Uzbekistan; the Former Soviet Union; the Former Yugoslavia.¹⁵

Non-OECD Asia excluding China includes Bangladesh; Brunei Darussalam; Cambodia (from 1995); India; Indonesia; the Democratic People's Republic of Korea; Malaysia; Mongolia (from 1985); Myanmar; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Chinese Taipei; Thailand; Viet Nam; **Other non-OECD Asia.**

China includes the (People's Republic of) China; Hong Kong, China.

Non-OECD Americas includes Argentina; the Plurinational State of Bolivia (Bolivia); Brazil; Colombia; Costa Rica; Cuba; Curaçao⁷; the Dominican Republic; Ecuador; El Salvador; Guatemala; Haiti; Honduras; Jamaica; Nicaragua; Panama; Paraguay; Peru; Suriname (from 2000), Trinidad and Tobago; Uruguay; the Bolivarian Republic of Venezuela (Venezuela); **Other non-OECD Americas.**

Middle East includes Bahrain; the Islamic Republic of Iran; Iraq; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; the Syrian Arab Republic; the United Arab Emirates; Yemen.

Other Africa includes Botswana (until 1980); Burkina Faso; Burundi; Cabo Verde; Central African Republic; Chad; Comoros; Djibouti; Equatorial Guinea; Gambia; Guinea; Guinea-Bissau; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Namibia (until 1990); Niger (until 1999); Réunion; Rwanda; Sao Tome and Principe; the Seychelles; Sierra Leone; Somalia; Swaziland; Uganda.

Other non-OECD Americas includes Antigua and Barbuda; Aruba; the Bahamas; Barbados; Belize; Bermuda; Bonaire (from 2012); the British Virgin Islands; the Cayman Islands; Dominica; the Falkland Islands (Malvinas); the French Guiana; Grenada; Guadeloupe; Guyana; Martinique; Montserrat; Puerto Rico (for natural gas and electricity)⁹; Saba (from 2012); Saint Eustatius (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Maarten (from 2012); Suriname (until 1999); the Turks and Caicos Islands.

Other non-OECD Asia includes Afghanistan; Bhutan; Cambodia (until 1994); Cook Islands; Fiji; French Polynesia; Kiribati; Lao People's Democratic Republic; Macau, China; the Maldives; Mongolia (until 1984); New Caledonia; Palau (from 1994); Papua New Guinea; Samoa; the Solomon Islands; Timor-Leste; Tonga; Vanuatu.

The **European Union - 28 (EU-28)** (from 1990) includes Austria; Belgium; Bulgaria; Croatia; Cyprus¹⁸; the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; the Netherlands; Poland; Portugal; Romania; the Slovak Republic; Slovenia; Spain; Sweden; the United Kingdom.

16. Refer to the country note for Cyprus earlier in this chapter.

Please note that in the interest of having comparable data, all these countries are included since 1990 despite different entry dates into the European Union.

G20 includes Argentina; Australia; Brazil; Canada; China (including Hong Kong, China); India; Indonesia; Japan; Korea; Mexico; the Russian Federation; Saudi Arabia; South Africa; Turkey; the United States; the European Union – 28.

Annex I Parties¹⁷ includes Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Cyprus¹⁸, the Czech Republic^{19,20}, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein (not available in this publication)²¹, Lithuania, Luxembourg, Malta, Monaco (included with France), the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, the Slovak Republic^{20,22}, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom and the United States.

The countries that are listed above are included in Annex I of the United Nations Framework Convention on Climate Change as amended on 11 December 1997 by the 12th Plenary meeting of the Third Conference of the Parties in Decision 4/CP.3. This includes the countries that were members of the OECD at the time of the signing of the Convention, the EEC, and fourteen countries in Central and Eastern Europe and the Former Soviet Union that were undergoing the process of transition to market economies. During subsequent sessions, the Conference of the Parties agreed to amend Annex I to the Convention to include Malta (Decision 3/CP.15, effective from 26 October 2010) and Cyprus²³ (Decision 10/CP.17, effective from 9 January 2013).

Annex II Parties includes Australia, Austria, Belgium, Canada, Denmark, Finland, France²⁴, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal,

Spain, Sweden, Switzerland²⁵, the United Kingdom and the United States.

According to Decision 26/CP.7 in document FCCC/CP/2001/13/Add.4, Turkey has been deleted from the list of Annex II countries to the Convention. This amendment entered into force on 28 June 2002.

Annex II North America includes Canada and the United States.

Annex II Europe includes Austria, Belgium, Denmark, Finland, France²⁴, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland²⁵ and the United Kingdom.

Annex II Asia Oceania includes Australia, Japan and New Zealand.

Annex I: Economies in Transition (EIT) are those countries in Annex I that were undergoing the process of transition to a market economy. This includes Belarus, Bulgaria, Croatia, the Czech Republic^{19,20}, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Russian Federation, the Slovak Republic^{20,22}, Slovenia and Ukraine.

Annex B Kyoto Parties¹⁷ includes Australia, Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus²³, the Czech Republic^{19,20}, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Latvia, Liechtenstein (not available in this publication) Lithuania, Luxembourg, Malta, Monaco (included with France), the Netherlands, Norway, Poland, Portugal, Romania, the Slovak Republic^{20,22}, Slovenia, Spain, Sweden, Switzerland, Ukraine and the United Kingdom.

Refers to countries with emissions targets under the second commitment period (CP) of the Kyoto Protocol (2013-2020) as per the Doha Amendment. This differs from the list of countries with targets under the first CP (2008-2012). Please note that the Doha Amendment has not yet entered into force. Membership of Annex B in the second CP of the Kyoto Protocol differs from that in Annex I. In particular, Annex B excludes, or does not contain targets for Canada, Japan, New Zealand, the Russian Federation, Turkey and the United States (all Annex I member states), but includes Kazakhstan (a non-Annex I Party under the Convention, but an Annex I Party under the Kyoto Protocol (as per decision 9/CMP.8)).

17. The European Union is also an Annex I Party in its own right. The EU was assigned an overall reduction target under the Kyoto Protocol, which by agreement, was used to determine the individual targets of the fifteen states that were EU members in 1997 when the Kyoto Protocol was adopted.

18. Refer to the country note for Cyprus earlier in this chapter.

19. Czechia in official UN documents.

20. Czechoslovakia was in the original list of Annex I countries.

21. Oil data for Liechtenstein are included under Switzerland.

22. Slovakia in official UN documents.

23. Refer to the country note for Cyprus earlier in this chapter.

24. In IEA data, France also includes Monaco, which is not in the list of Annex II Parties.

25. In IEA data, Switzerland includes Oil data for Liechtenstein, which is not in the list of Annex II Parties.

Please note that the following countries have not been considered:

- **Non-OECD Europe and Eurasia:** Andorra; Faroe Islands (after 1990); Liechtenstein (except for oil data); the Palestinian Authority; Svalbard; Jan Mayen Islands;
- **Africa:** British Indian Ocean Territory; French Southern and Antarctic Lands; Mayotte; Saint Helena; Western Sahara;
- **Non-OECD Americas:** Anguilla; Bouvet Island; Saint Barthélemy; Greenland (after 1990);
- Saint Martin (French Part); South Georgia and the South Sandwich Islands;
- Antarctica;
- **Non-OECD Asia excluding China:** American Samoa; Cocos (Keeling) Islands; Christmas Island; Heard Island and McDonald Islands; Marshall Islands; Micronesia (Federated States of); Nauru; Niue; Norfolk Island; Northern Mariana Islands; Pitcairn; Tokelau; Tuvalu; United States Minor Outlying Islands; Wallis and Futuna Islands.

4. GRAPHS AND TABLES FOR REGIONAL AGGREGATES

World

Figure 1. CO₂ emissions by fuel

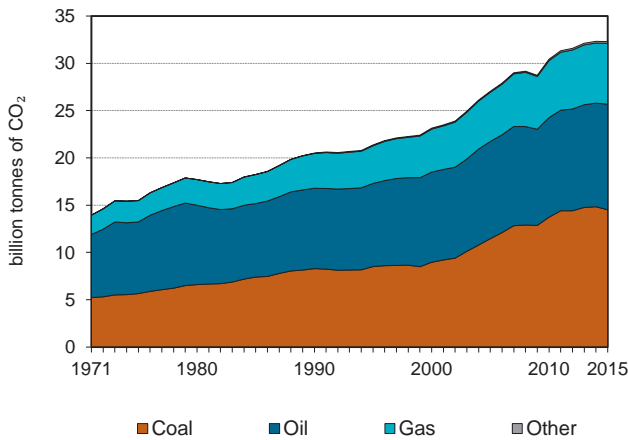


Figure 2. CO₂ emissions by sector

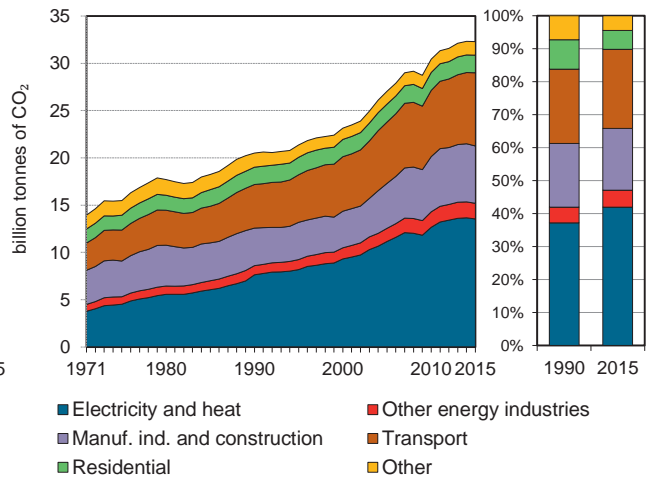


Figure 3. Electricity generation by fuel

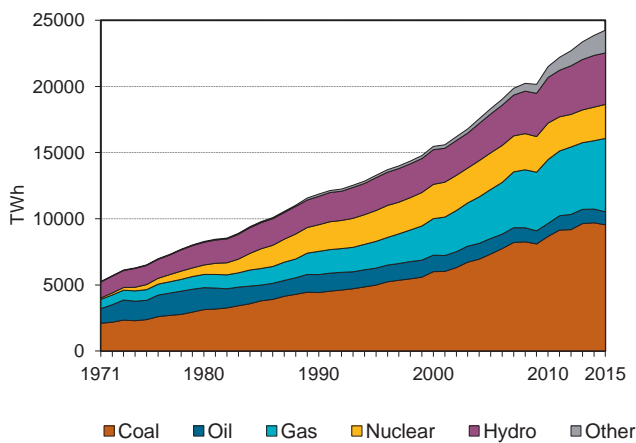


Figure 4. CO₂ from electricity generation: driving factors¹

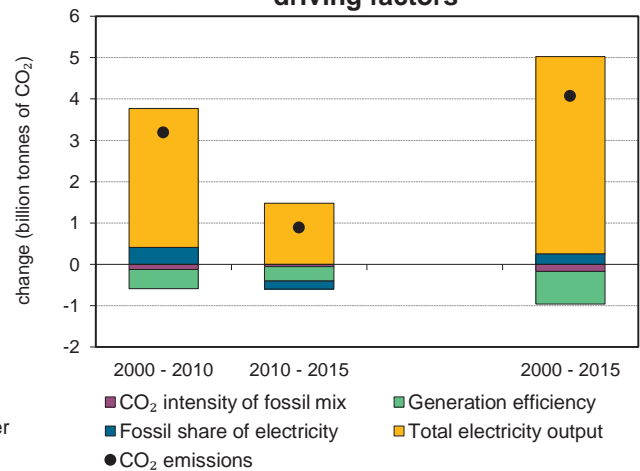


Figure 5. Changes in selected indicators

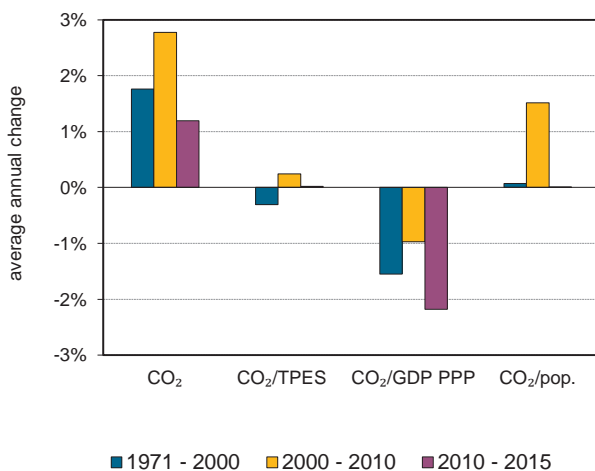
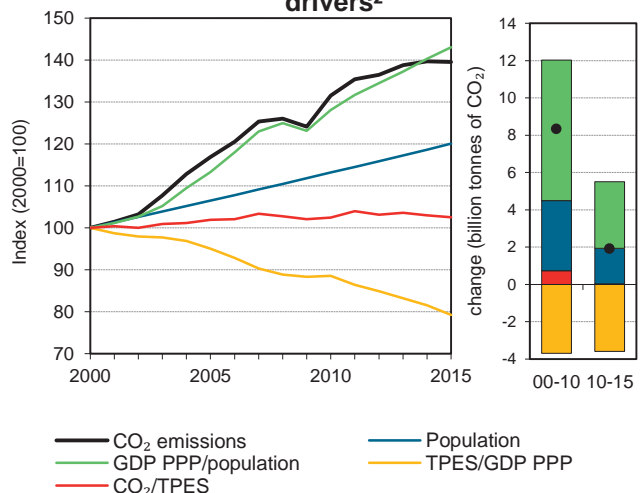


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

World

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	20509	21 365.0	23 144.3	27 045.0	30 434.4	32 324.7	32 294.2	57%
Share of World CO ₂ from fuel combustion	100%	100%	100%	100%	100%	100%	100%	
TPES (PJ)	367351	386 343	419 833	481 445	538 969	569 596	571 388	56%
GDP (billion 2010 USD)	37949	42 135.9	49 923.6	58 086.8	66 018.1	73 547.2	75 489.0	99%
GDP PPP (billion 2010 USD)	45734.9	50 972.6	61 152.2	73 790.8	88 652.4	101 773.3	105 035.2	130%
Population (millions)	5279.5	5 703.6	6 108.6	6 505.0	6 913.3	7 247.3	7 333.8	39%
CO ₂ / TPES (tCO ₂ per TJ)	55.8	55.3	55.1	56.2	56.5	56.8	56.5	1%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.54	0.5	0.5	0.5	0.5	0.4	0.4	-21%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.4	0.3	0.3	0.3	-31%
CO ₂ / population (tCO ₂ per capita)	3.9	3.7	3.8	4.2	4.4	4.5	4.4	13%
Share of electricity output from fossil fuels	64%	63%	65%	67%	68%	67%	67%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	532	533	533	546	530	519	506	-5%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	113	132	148	158	157	57%
Population index	100	108	116	123	131	137	139	39%
GDP PPP per population index	100	103	116	131	148	162	165	65%
Energy intensity index - TPES / GDP PPP	100	94	85	81	76	70	68	-32%
Carbon intensity index - CO ₂ / TPES	100	99	99	101	101	102	101	1%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	14 512.7	11 169.1	6 437.0	175.4	32 294.2	57%
Electricity and heat generation	9 728.6	844.4	2 843.7	123.8	13 540.6	77%
Other energy industry own use	373.2	600.7	679.0	1.8	1 654.8	71%
Manufacturing industries and construction	3 792.1	984.5	1 244.4	45.1	6 066.1	53%
Transport	10.0	7 498.5	229.2	..	7 737.8	68%
<i>of which: road</i>	<i>x</i>	<i>5 695.7</i>	<i>96.3</i>	<i>x</i>	<i>5 792.0</i>	<i>75%</i>
Other	608.8	1 240.8	1 440.6	4.6	3 294.8	-1%
<i>of which: residential</i>	<i>291.2</i>	<i>588.6</i>	<i>986.1</i>	<i>0.0</i>	<i>1 865.9</i>	<i>2%</i>
<i>of which: services</i>	<i>142.2</i>	<i>254.8</i>	<i>426.2</i>	<i>4.4</i>	<i>827.5</i>	<i>9%</i>
<i>Memo: international marine bunkers</i>	<i>..</i>	<i>657.0</i>	<i>..</i>	<i>..</i>	<i>657.0</i>	<i>77%</i>
<i>Memo: international aviation bunkers</i>	<i>..</i>	<i>529.7</i>	<i>..</i>	<i>..</i>	<i>529.7</i>	<i>105%</i>

2. Other includes industrial waste and non-renewable municipal waste. 3. World includes international marine bunkers and international aviation bunkers.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	8999.7	94.9	16.2	16.2
Road - oil	5695.7	72.7	10.3	26.5
Manufacturing industries - coal	3792.1	82.5	6.8	33.4
Main activity prod. elec. and heat - gas	2377.9	129.8	4.3	37.7
Other transport - oil	1802.9	60.0	3.3	40.9
Manufacturing industries - gas	1244.4	46.8	2.2	43.2
Residential - gas	986.1	52.8	1.8	45.0
Manufacturing industries - oil	984.5	-5.2	1.8	46.7
Unallocated autoproducers - coal	728.9	93.8	1.3	48.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>32294.2</i>	<i>57.5</i>	<i>58.3</i>	<i>58.3</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

UNFCCC ANNEXES

Annex I Parties

Figure 1. CO₂ emissions by fuel

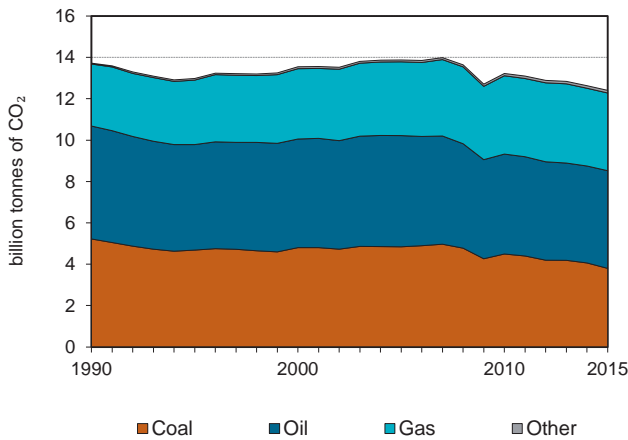


Figure 2. CO₂ emissions by sector

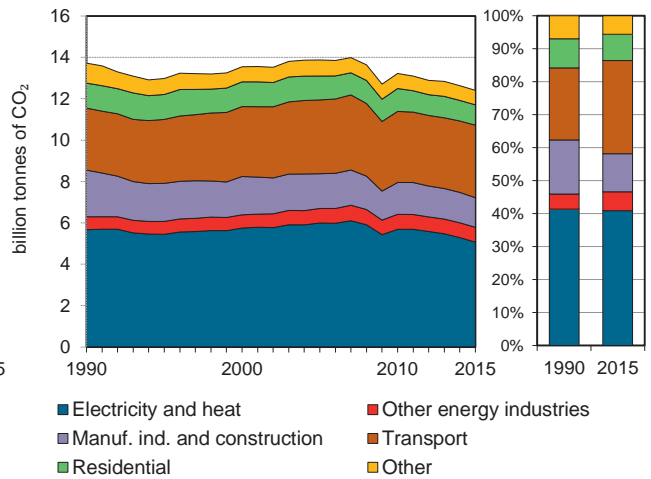


Figure 3. Electricity generation by fuel

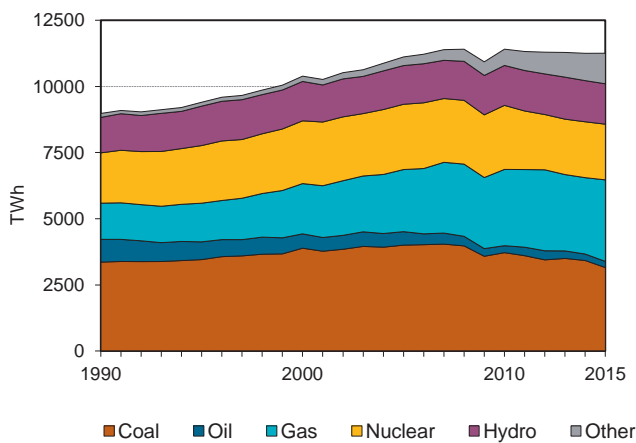


Figure 4. CO₂ from electricity generation: driving factors¹

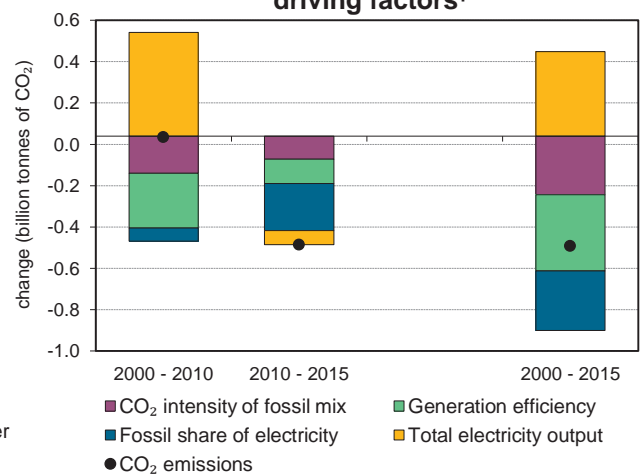


Figure 5. Changes in selected indicators

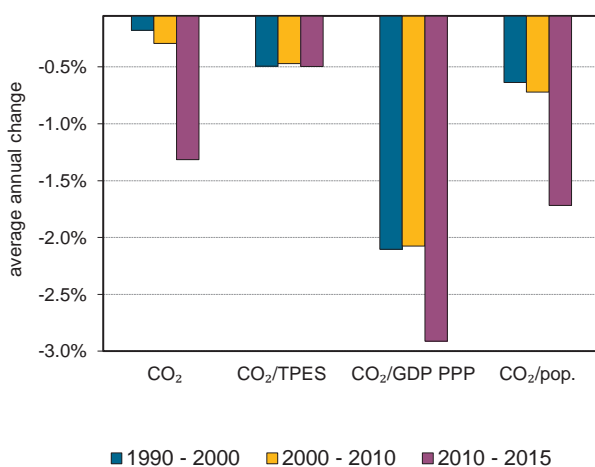
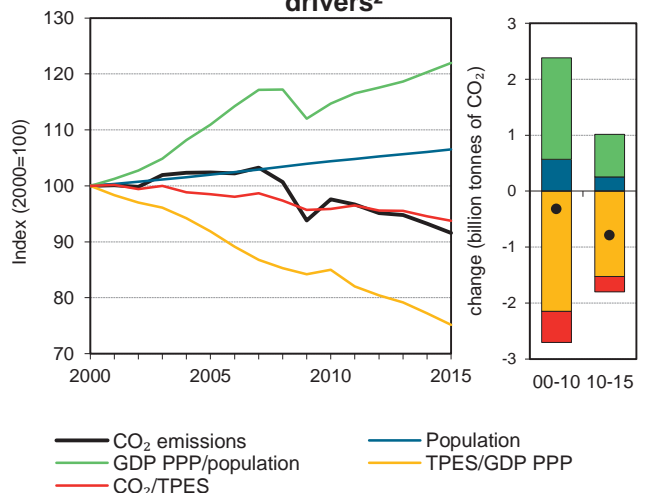


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Annex I Parties

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	13722.6	12 981.1	13 548.3	13 875.9	13 222.9	12 631.8	12 406.5	-10%
Share of World CO ₂ from fuel combustion	67%	61%	59%	51%	43%	39%	38%	
TPES (PJ)	233956	229 746	241 497	251 032	245 850	238 047	235 892	1%
GDP (billion 2010 USD)	30199.1	32 366.2	37 753.7	42 247.0	44 308.9	47 087.3	48 019.5	59%
GDP PPP (billion 2010 USD)	30175.2	31 434.4	36 655.7	41 479.7	43 895.7	46 785.6	47 627.8	58%
Population (millions)	1176.8	1 208.1	1 232.1	1 256.7	1 286.4	1 307.1	1 312.8	12%
CO ₂ / TPES (tCO ₂ per TJ)	58.7	56.5	56.1	55.3	53.8	53.1	52.6	-10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.3	0.3	0.3	0.3	-43%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.3	0.3	0.3	0.3	-43%
CO ₂ / population (tCO ₂ per capita)	11.7	10.7	11.0	11.0	10.3	9.7	9.5	-19%
Share of electricity output from fossil fuels	62%	60%	61%	62%	61%	59%	58%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	503	482	476	471	432	410	395	-22%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	95	99	101	96	92	90	-10%
Population index	100	103	105	107	109	111	112	12%
GDP PPP per population index	100	101	116	129	133	140	141	41%
Energy intensity index - TPES / GDP PPP	100	94	85	78	72	66	64	-36%
Carbon intensity index - CO ₂ / TPES	100	96	96	94	92	90	90	-10%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	3 801.1	4 722.5	3 757.0	125.9	12 406.5	-10%
Electricity and heat generation	3 176.3	192.8	1 611.1	87.4	5 067.6	-11%
Other energy industry own use	91.0	317.8	308.7	1.8	719.3	15%
Manufacturing industries and construction	443.7	296.8	656.1	33.5	1 430.0	-37%
Transport	0.1	3 382.0	125.6	-	3 507.6	17%
<i>of which: road</i>	-	3 023.4	7.2	-	3 030.7	24%
Other	90.0	533.3	1 055.6	3.1	1 682.0	-23%
<i>of which: residential</i>	55.3	232.7	694.9	0.0	982.9	-19%
<i>of which: services</i>	30.0	148.8	341.4	2.9	523.0	-18%
<i>Memo: international marine bunkers</i>	-	246.3	-	-	246.3	4%
<i>Memo: international aviation bunkers</i>	-	276.3	-	-	276.3	61%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	3023.4	23.5	16.6	16.6
Main activity prod. elec. and heat - coal	2968.6	-12.9	16.3	32.9
Main activity prod. elec. and heat - gas	1320.7	62.3	7.2	40.1
Residential - gas	694.9	15.1	3.8	43.9
Manufacturing industries - gas	656.1	-3.8	3.6	47.5
Manufacturing industries - coal	443.7	-54.0	2.4	49.9
Non-specified other - gas	360.7	24.1	2.0	51.9
Other transport - oil	358.5	-15.3	2.0	53.9
Other energy industry own use - oil	317.8	-13.0	1.7	55.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>12406.5</i>	<i>-9.6</i>	<i>68.0</i>	<i>68.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex II Parties

Figure 1. CO₂ emissions by fuel

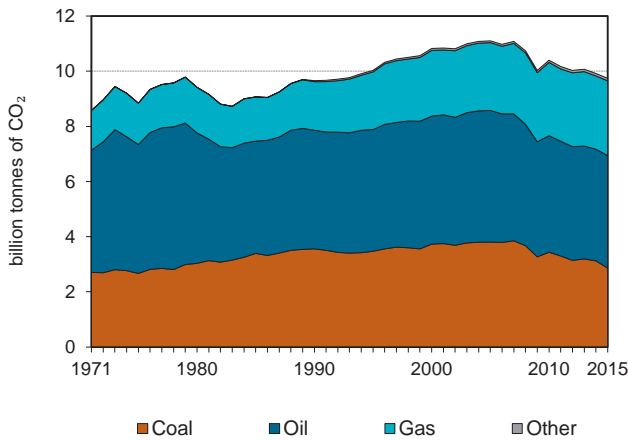


Figure 2. CO₂ emissions by sector

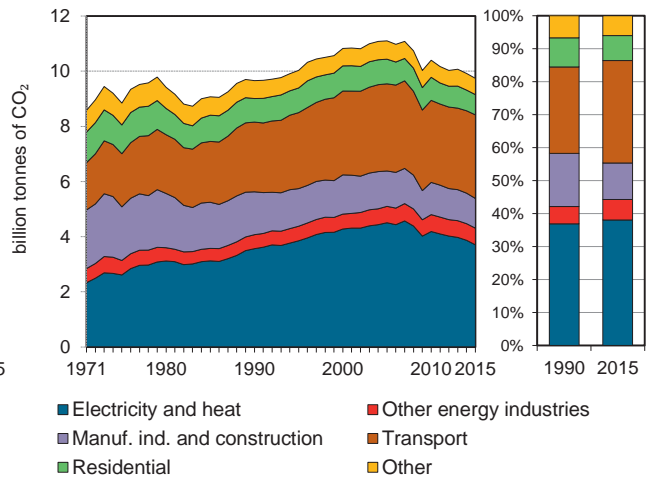


Figure 3. Electricity generation by fuel

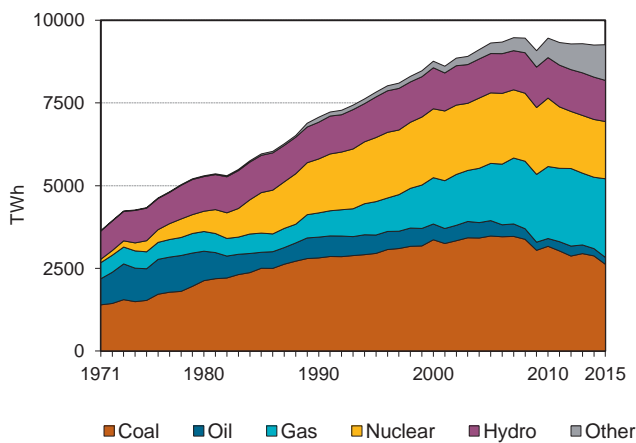


Figure 4. CO₂ from electricity generation: driving factors¹

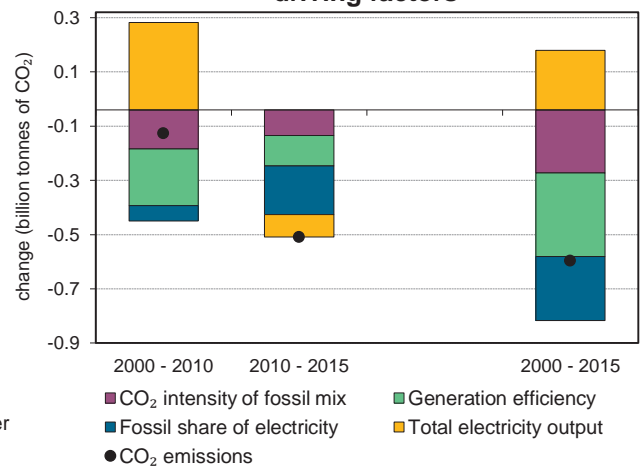


Figure 5. Changes in selected indicators

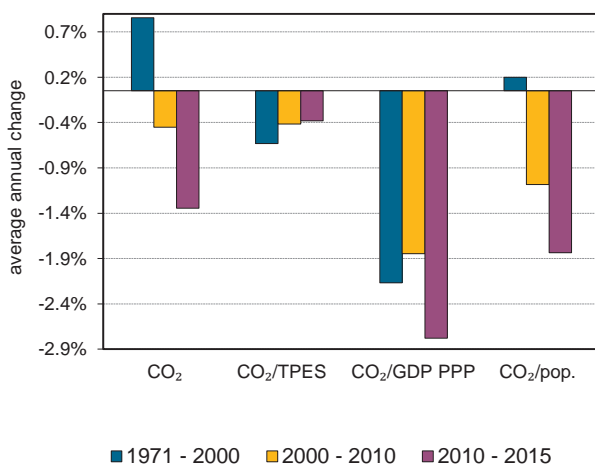
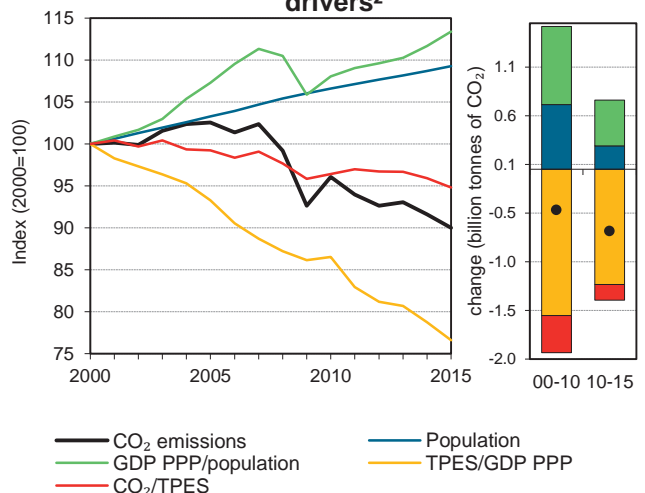


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Annex II Parties

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	9658.1	10 029.2	10 825.1	11 100.7	10 398.5	9 917.9	9 741.7	1%
Share of World CO ₂ from fuel combustion	47%	47%	47%	41%	34%	31%	30%	
TPES (PJ)	168062	180 510	194 841	201 355	194 144	186 153	184 912	10%
GDP (billion 2010 USD)	27256.2	30 077.3	35 154.1	38 886.9	40 372.1	42 622.8	43 523.3	60%
GDP PPP (billion 2010 USD)	24854.4	27 427.6	32 137.3	35 606.8	37 009.5	38 998.2	39 813.5	60%
Population (millions)	799.6	827.6	852.6	880.5	908.8	926.6	931.6	17%
CO ₂ / TPES (tCO ₂ per TJ)	57.5	55.6	55.6	55.1	53.6	53.3	52.7	-8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.35	0.3	0.3	0.3	0.3	0.2	0.2	-37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.39	0.4	0.3	0.3	0.3	0.3	0.2	-37%
CO ₂ / population (tCO ₂ per capita)	12.1	12.1	12.7	12.6	11.4	10.7	10.5	-13%
Share of electricity output from fossil fuels	59%	58%	60%	61%	59%	57%	57%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	494	479	476	469	426	405	387	-22%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	112	115	108	103	101	1%
Population index	100	103	107	110	114	116	117	17%
GDP PPP per population index	100	107	121	130	131	135	137	37%
Energy intensity index - TPES / GDP PPP	100	97	90	84	78	71	69	-31%
Carbon intensity index - CO ₂ / TPES	100	97	97	96	93	93	92	-8%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	2 863.3	4 078.6	2 710.6	89.1	9 741.7	1%
Electricity and heat generation	2 479.4	147.6	1 014.1	64.5	3 705.6	4%
Other energy industry own use	69.0	260.8	272.8	0.4	603.0	19%
Manufacturing industries and construction	301.2	238.3	516.6	22.4	1 078.4	-31%
Transport	0.0	2 976.8	54.2	-	3 031.0	20%
<i>of which: road</i>	-	2 653.4	6.4	-	2 659.8	24%
Other	13.6	455.2	852.9	1.9	1 323.6	-12%
<i>of which: residential</i>	7.5	204.8	521.9	0.0	734.2	-14%
<i>of which: services</i>	5.5	136.6	316.1	1.9	460.1	-5%
<i>Memo: international marine bunkers</i>	-	185.7	-	-	185.7	-18%
<i>Memo: international aviation bunkers</i>	-	243.0	-	-	243.0	83%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	2653.4	23.7	19.0	19.0
Main activity prod. elec. and heat - coal	2362.8	-8.3	16.9	35.9
Main activity prod. elec. and heat - gas	890.2	192.6	6.4	42.3
Residential - gas	521.9	16.3	3.7	46.0
Manufacturing industries - gas	516.6	7.7	3.7	49.7
Non-specified other - gas	331.1	32.2	2.4	52.1
Other transport - oil	323.4	-4.7	2.3	54.4
Manufacturing industries - coal	301.2	-52.3	2.2	56.5
Other energy industry own use - gas	272.8	78.6	2.0	58.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>9741.7</i>	<i>0.9</i>	<i>69.7</i>	<i>69.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex I: Economies in Transition

Figure 1. CO₂ emissions by fuel

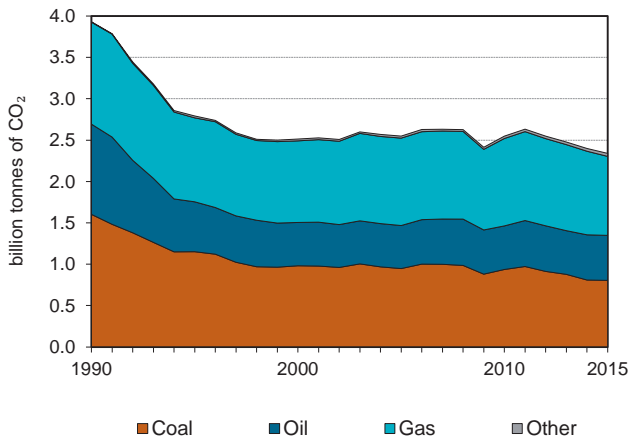


Figure 2. CO₂ emissions by sector

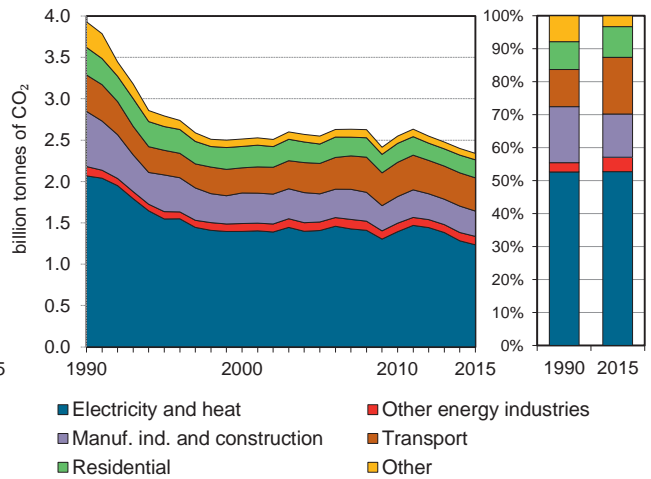


Figure 3. Electricity generation by fuel

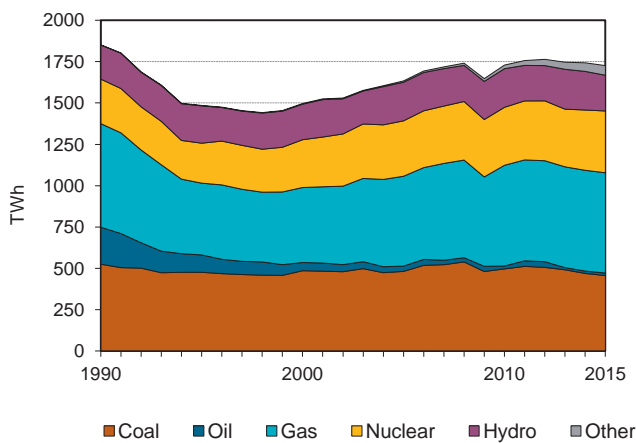


Figure 4. CO₂ from electricity generation: driving factors¹

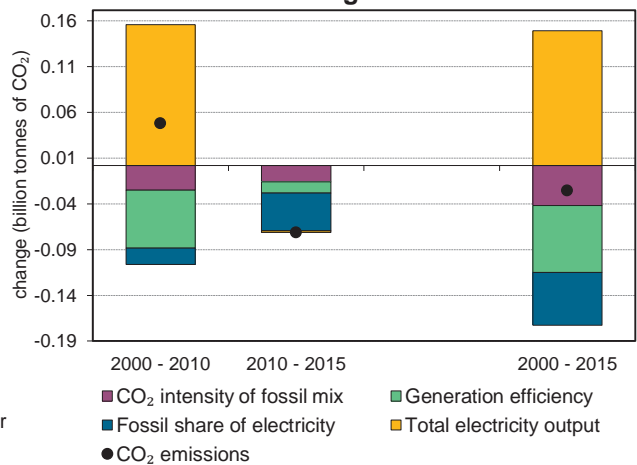


Figure 5. Changes in selected indicators

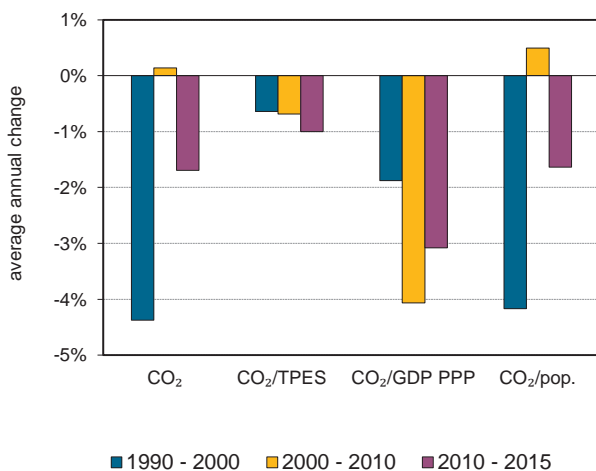
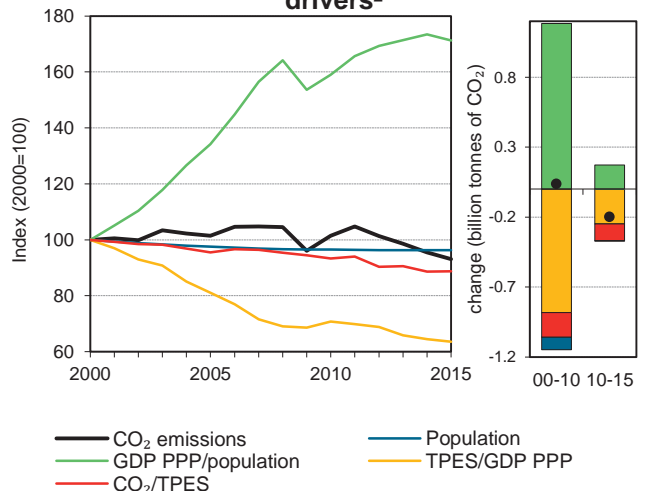


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Annex I: Economies in Transition

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	3930.8	2 792.3	2 513.3	2 548.8	2 548.7	2 399.2	2 340.1	-40%
Share of World CO ₂ from fuel combustion	19%	13%	11%	9%	8%	7%	7%	
TPES (PJ)	63601	46 558	43 360	46 022	47 103	46 692	45 475	-28%
GDP (billion 2010 USD)	2562.5	1 841.4	2 052.5	2 671.4	3 130.6	3 406.1	3 374.7	32%
GDP PPP (billion 2010 USD)	4706.5	3 285.2	3 636.2	4 761.3	5 584.1	6 071.9	5 996.0	27%
Population (millions)	321.1	319.7	314.2	306.5	303.3	302.5	302.5	-6%
CO ₂ / TPES (tCO ₂ per TJ)	61.8	60.0	58.0	55.4	54.1	51.4	51.5	-17%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.53	1.5	1.2	1.0	0.8	0.7	0.7	-55%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.84	0.9	0.7	0.5	0.5	0.4	0.4	-53%
CO ₂ / population (tCO ₂ per capita)	12.2	8.7	8.0	8.3	8.4	7.9	7.7	-37%
Share of electricity output from fossil fuels	74%	69%	66%	65%	65%	63%	63%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	535	492	472	483	461	427	429	-20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	71	64	65	65	61	60	-40%
Population index	100	100	98	95	94	94	94	-6%
GDP PPP per population index	100	70	79	106	126	137	135	35%
Energy intensity index - TPES / GDP PPP	100	105	88	72	62	57	56	-44%
Carbon intensity index - CO ₂ / TPES	100	97	94	90	88	83	83	-17%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15	
CO₂ fuel combustion	804.8	544.0	954.9	36.3	2 340.1	-40%	
Electricity and heat generation	615.8		39.3	557.0	22.6	1 234.6	-40%
Other energy industry own use	15.3		52.6	32.7	1.4	102.0	-10%
Manufacturing industries and construction	120.5		55.0	119.6	11.0	306.1	-54%
Transport	0.0		331.1	70.6	-	401.7	-9%
<i>of which: road</i>	-		301.0	0.6	-	301.6	8%
Other	53.2		66.1	175.0	1.2	295.6	-54%
<i>of which: residential</i>	39.8		26.5	151.8	-	218.1	-35%
<i>of which: services</i>	9.3		10.3	19.2	1.0	39.7	-74%
<i>Memo: international marine bunkers</i>	-		52.2	-	-	52.2	429%
<i>Memo: international aviation bunkers</i>	-		21.6	-	-	21.6	-42%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	524.7	-35.1	13.7	13.7
Main activity prod. elec. and heat - gas	390.5	-22.6	10.2	24.0
Road - oil	301.0	8.8	7.9	31.8
Unallocated autoproducers - gas	166.5	-25.0	4.4	36.2
Residential - gas	151.8	-2.0	4.0	40.2
Manufacturing industries - coal	120.5	-61.5	3.2	43.3
Manufacturing industries - gas	119.6	-40.5	3.1	46.4
Unallocated autoproducers - coal	91.1	-46.3	2.4	48.8
Other transport - gas	69.9	-9.9	1.8	50.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>2340.1</i>	<i>-40.5</i>	<i>61.2</i>	<i>61.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-Annex I Parties

Figure 1. CO₂ emissions by fuel

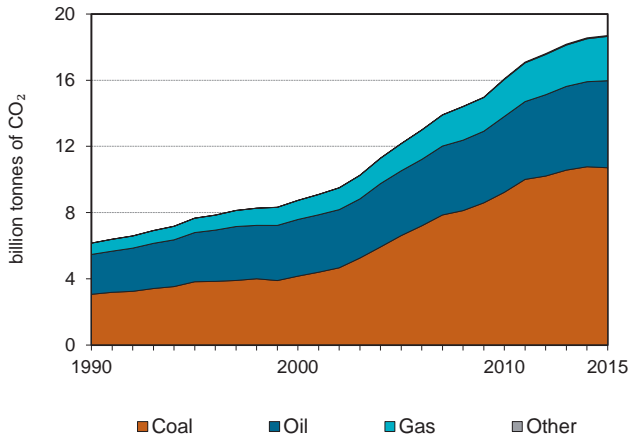


Figure 2. CO₂ emissions by sector

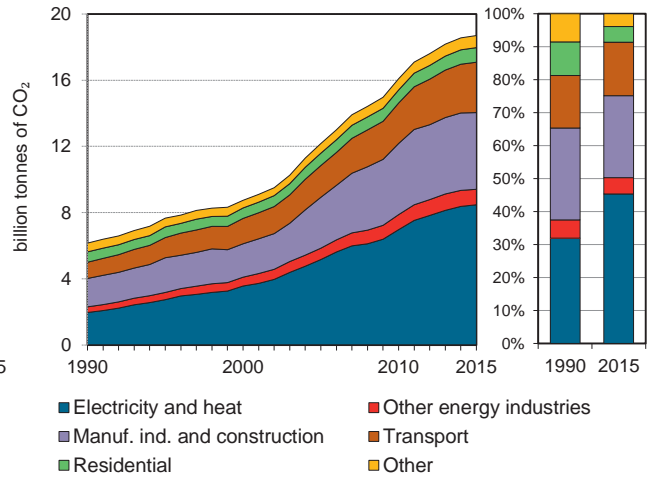


Figure 3. Electricity generation by fuel

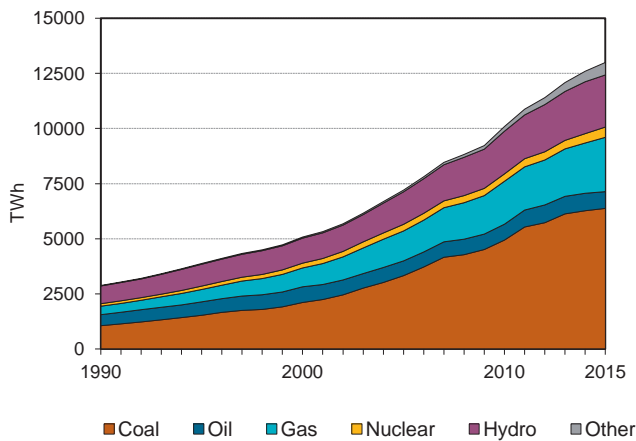


Figure 4. CO₂ from electricity generation: driving factors¹

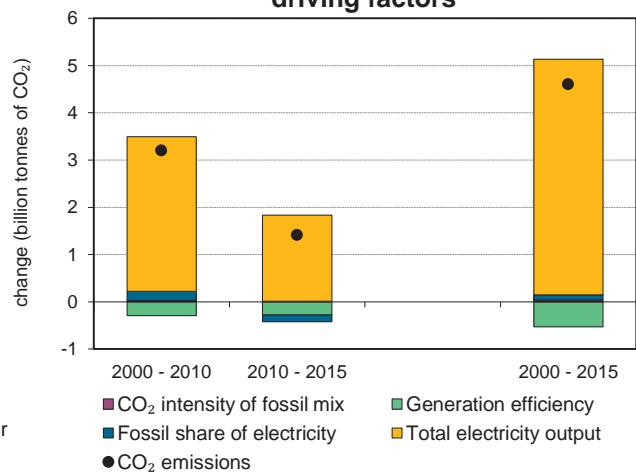


Figure 5. Changes in selected indicators

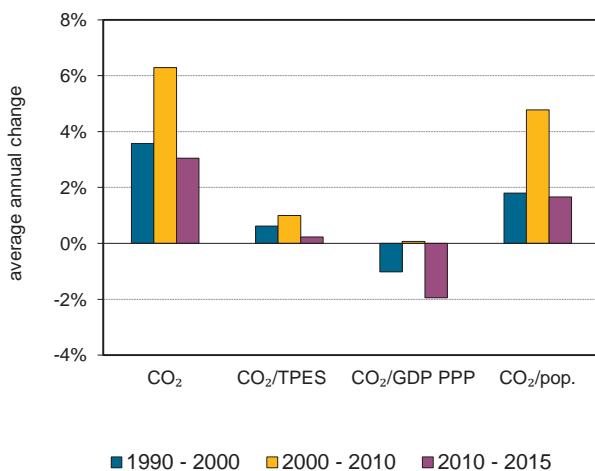
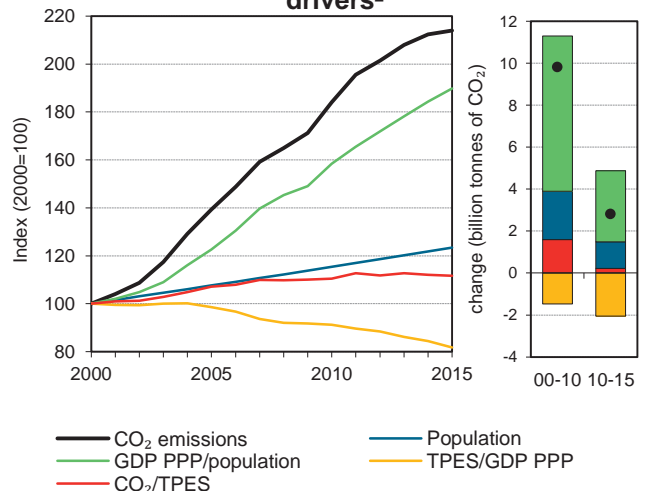


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Non-Annex I Parties

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	6155.8	7 665.0	8 741.9	12 174.4	16 090.9	18 560.7	18 700.9	204%
Share of World CO ₂ from fuel combustion	30%	36%	38%	45%	53%	57%	58%	
TPES (PJ)	124926	146 952	166 866	217 059	278 098	316 318	319 511	156%
GDP (billion 2010 USD)	7749.9	9 769.7	12 169.9	15 839.8	21 709.2	26 459.9	27 469.5	254%
GDP PPP (billion 2010 USD)	15559.7	19 538.1	24 496.5	32 311.1	44 756.7	54 987.7	57 407.4	269%
Population (millions)	4102.8	4 495.5	4 876.5	5 248.4	5 626.9	5 940.3	6 021.0	47%
CO ₂ / TPES (tCO ₂ per TJ)	49.3	52.2	52.4	56.1	57.9	58.7	58.5	19%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.79	0.8	0.7	0.8	0.7	0.7	0.7	-14%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.4	0.4	0.4	0.4	0.4	0.3	0.3	-18%
CO ₂ / population (tCO ₂ per capita)	1.5	1.7	1.8	2.3	2.9	3.1	3.1	107%
Share of electricity output from fossil fuels	67%	70%	72%	74%	76%	74%	74%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	624	658	649	662	640	616	603	-3%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	125	142	198	261	302	304	204%
Population index	100	110	119	128	137	145	147	47%
GDP PPP per population index	100	115	132	162	210	244	251	151%
Energy intensity index - TPES / GDP PPP	100	94	85	84	77	72	69	-31%
Carbon intensity index - CO ₂ / TPES	100	106	106	114	117	119	119	19%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	10 711.6	5 259.8	2 680.0	49.5	18 700.9	204%
Electricity and heat generation	6 552.3	651.7	1 232.7	36.4	8 473.1	331%
Other energy industry own use	282.2	283.0	370.3	-	935.5	175%
Manufacturing industries and construction	3 348.4	687.7	588.4	11.6	4 636.1	170%
Transport	9.9	2 929.9	103.7	..	3 043.5	211%
<i>of which: road</i>	<i>x</i>	<i>2 672.2</i>	<i>89.0</i>	<i>x</i>	<i>2 761.3</i>	<i>225%</i>
Other	518.8	707.6	385.0	1.5	1 612.8	40%
<i>of which: residential</i>	<i>235.9</i>	<i>355.9</i>	<i>291.1</i>	<i>x</i>	<i>882.9</i>	<i>41%</i>
<i>of which: services</i>	<i>112.2</i>	<i>106.0</i>	<i>84.9</i>	<i>1.5</i>	<i>304.6</i>	<i>146%</i>
<i>Memo: international marine bunkers</i>	<i>..</i>	<i>410.7</i>	<i>..</i>	<i>..</i>	<i>410.7</i>	<i>204%</i>
<i>Memo: international aviation bunkers</i>	<i>..</i>	<i>253.4</i>	<i>..</i>	<i>..</i>	<i>253.4</i>	<i>189%</i>

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	6031.1	397.7	16.8	16.8
Manufacturing industries - coal	3348.4	200.8	9.3	26.1
Road - oil	2672.2	214.7	7.4	33.5
Main activity prod. elec. and heat - gas	1057.2	378.5	2.9	36.5
Manufacturing industries - oil	687.7	57.6	1.9	38.4
Manufacturing industries - gas	588.4	255.5	1.6	40.0
Main activity prod. elec. and heat - oil	554.0	37.6	1.5	41.6
Unallocated autoproducers - coal	521.2	765.2	1.5	43.0
Other energy industry own use - gas	370.3	209.4	1.0	44.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>18700.9</i>	<i>203.8</i>	<i>52.0</i>	<i>52.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex B Kyoto Parties

Figure 1. CO₂ emissions by fuel

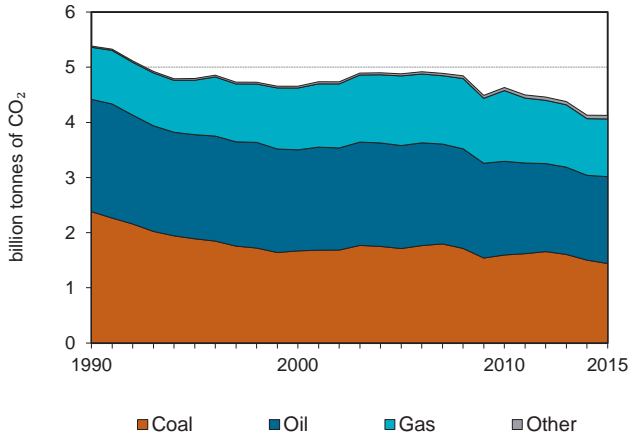


Figure 2. CO₂ emissions by sector

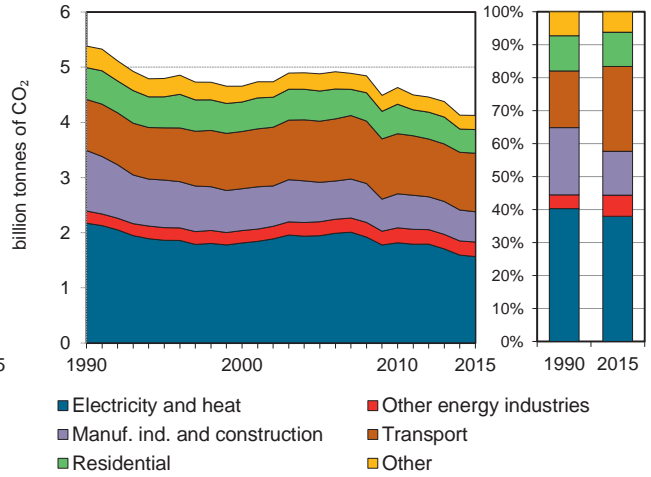


Figure 3. Electricity generation by fuel

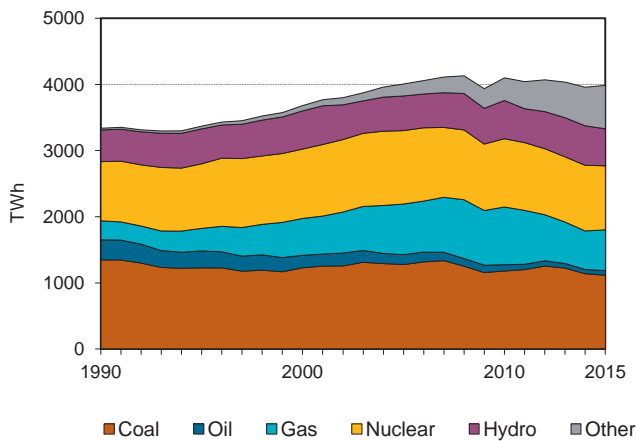


Figure 4. CO₂ from electricity generation: driving factors¹

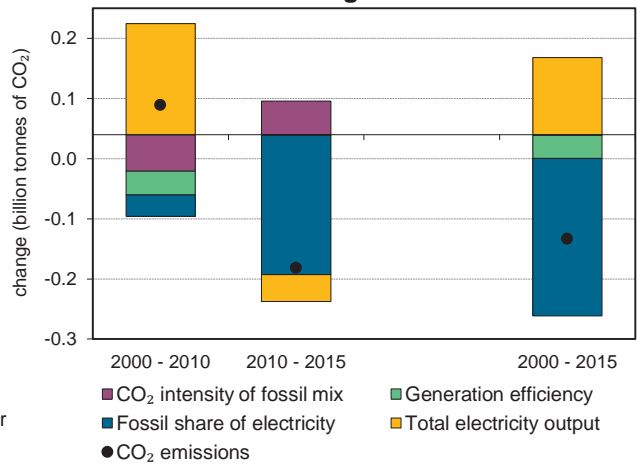


Figure 5. Changes in selected indicators

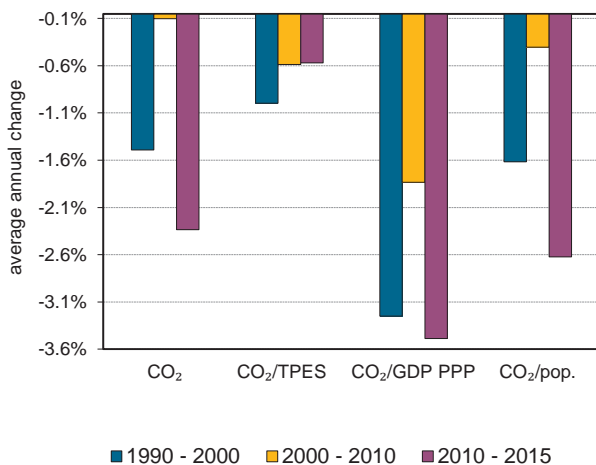
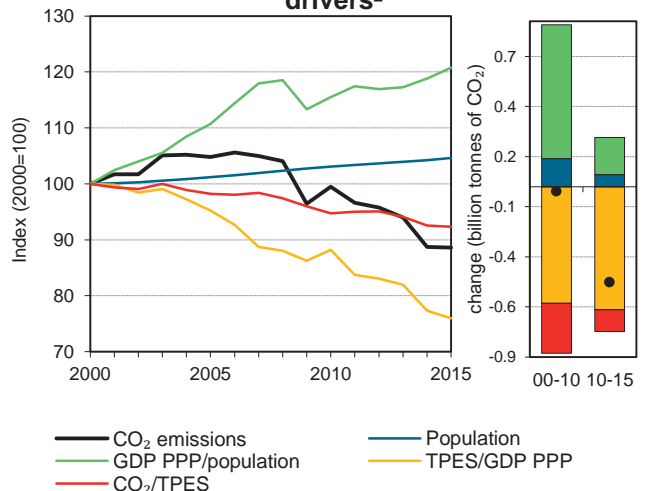


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Annex B Kyoto Parties

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	5383.4	4 795.5	4 655.6	4 879.7	4 631.6	4 130.0	4 126.0	-23%
Share of World CO ₂ from fuel combustion	26%	22%	20%	18%	15%	13%	13%	
TPES (PJ)	90089	85 064	85 686	91 422	89 962	82 102	82 264	-9%
GDP (billion 2010 USD)	13578.1	14 499.2	16 768.1	18 590.7	19 634.0	20 422.2	20 846.9	54%
GDP PPP (billion 2010 USD)	13505.9	14 024.1	16 173.3	18 120.0	19 254.6	20 034.9	20 436.1	51%
Population (millions)	584.8	590.7	592.4	599.6	610.6	617.5	619.7	6%
CO ₂ / TPES (tCO ₂ per TJ)	59.8	56.4	54.3	53.4	51.5	50.3	50.2	-16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.4	0.3	0.3	0.3	0.2	0.2	0.2	-50%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.4	0.3	0.3	0.3	0.2	0.2	0.2	-49%
CO ₂ / population (tCO ₂ per capita)	9.2	8.1	7.9	8.1	7.6	6.7	6.7	-28%
Share of electricity output from fossil fuels	58%	54%	54%	55%	53%	46%	46%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	509	458	417	409	370	341	332	-35%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	89	86	91	86	77	77	-23%
Population index	100	101	101	103	104	106	106	6%
GDP PPP per population index	100	103	118	131	137	140	143	43%
Energy intensity index - TPES / GDP PPP	100	91	79	76	70	61	60	-40%
Carbon intensity index - CO ₂ / TPES	100	94	91	89	86	84	84	-16%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	1 440.6	1 574.8	1 046.0	64.7	4 126.0	-23%
Electricity and heat generation	1 147.0	59.5	315.9	43.8	1 566.3	-28%
Other energy industry own use	43.4	108.9	111.6	0.4	264.3	19%
Manufacturing industries and construction	191.0	120.5	217.7	19.2	548.4	-50%
Transport	0.2	1 047.9	13.3	-	1 061.4	15%
<i>of which: road</i>	-	989.5	4.5	-	993.9	16%
Other	59.0	237.9	387.4	1.3	685.6	-29%
<i>of which: residential</i>	46.6	117.8	265.1	0.0	429.5	-25%
<i>of which: services</i>	7.7	54.7	111.3	1.3	175.0	-18%
<i>Memo: international marine bunkers</i>	-	138.3	-	-	138.3	18%
<i>Memo: international aviation bunkers</i>	-	156.4	-	-	156.4	74%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	1084.6	-21.3	17.8	17.8
Road - oil	989.5	16.0	16.2	33.9
Residential - gas	265.1	27.4	4.3	38.3
Main activity prod. elec. and heat - gas	248.2	9.5	4.1	42.3
Manufacturing industries - gas	217.7	-27.4	3.6	45.9
Manufacturing industries - coal	191.0	-64.1	3.1	49.0
Non-specified other - gas	122.3	10.6	2.0	51.0
Manufacturing industries - oil	120.5	-53.6	2.0	53.0
Non-specified other - oil	120.1	-40.6	2.0	55.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>4126.0</i>	<i>-23.4</i>	<i>67.5</i>	<i>67.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

REGIONAL AGGREGATES

Africa

Figure 1. CO₂ emissions by fuel

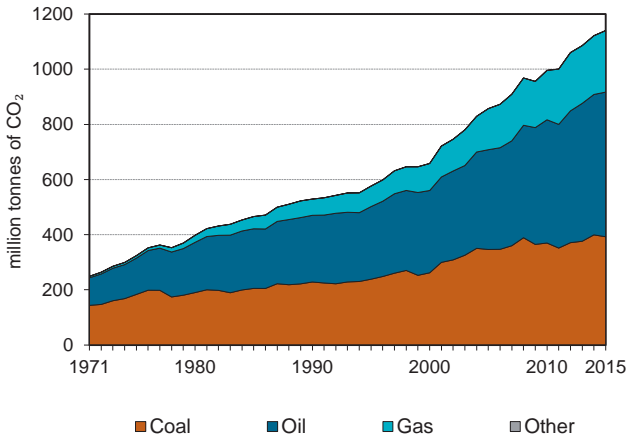


Figure 2. CO₂ emissions by sector

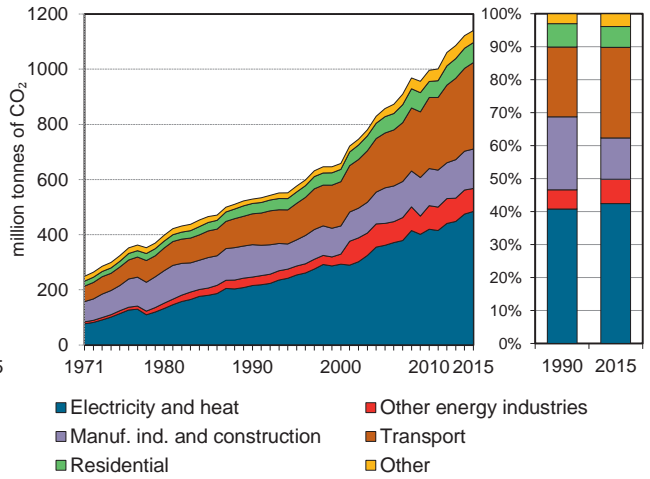


Figure 3. Electricity generation by fuel

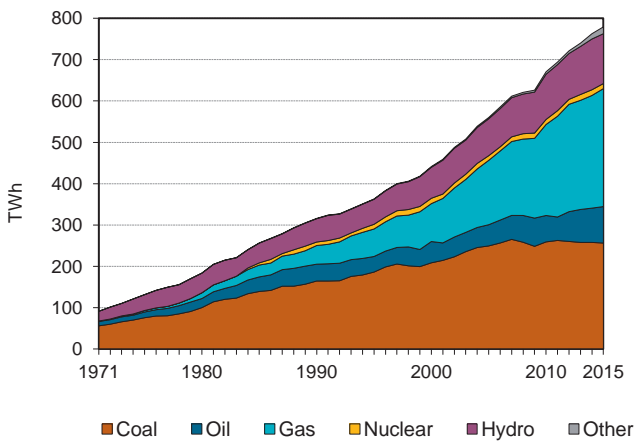


Figure 4. CO₂ from electricity generation: driving factors¹

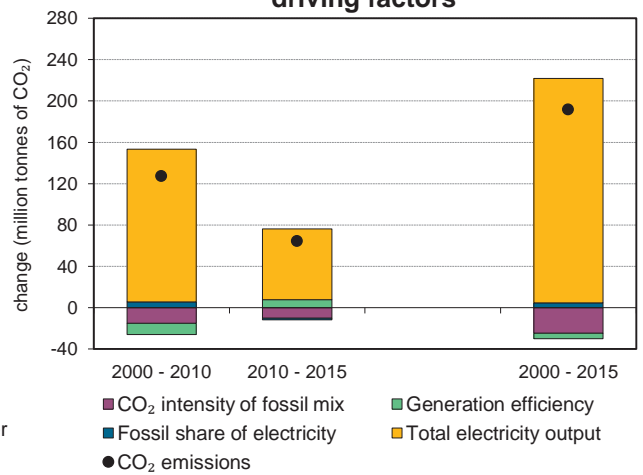


Figure 5. Changes in selected indicators

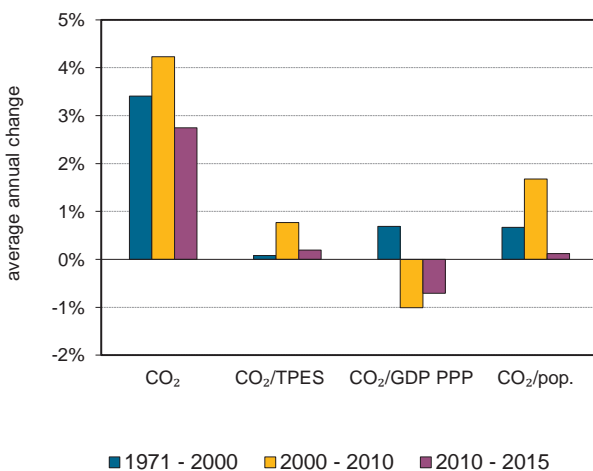
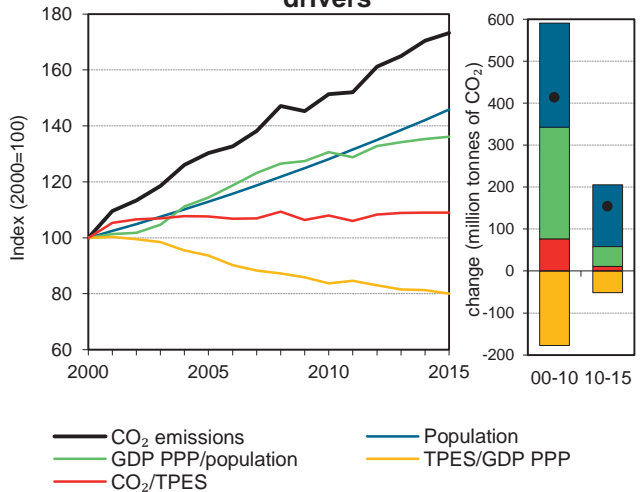


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Africa

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	529	576.2	658.1	857.3	996.1	1 121.8	1 140.4	116%
Share of World CO ₂ from fuel combustion	3%	3%	3%	3%	3%	3%	4%	
TPES (PJ)	16451	18 589	20 749	25 120	29 084	32 462	32 976	100%
GDP (billion 2010 USD)	926.4	974.8	1 164.8	1 510.5	1 949.0	2 239.3	2 306.1	149%
GDP PPP (billion 2010 USD)	2106.3	2 240.7	2 697.0	3 485.7	4 516.7	5 187.4	5 357.8	154%
Population (millions)	628.1	720.0	813.6	918.9	1 042.7	1 156.0	1 186.9	89%
CO ₂ / TPES (tCO ₂ per TJ)	32.2	31.0	31.7	34.1	34.2	34.6	34.6	8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.57	0.6	0.6	0.6	0.5	0.5	0.5	-13%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.25	0.3	0.2	0.2	0.2	0.2	0.2	-15%
CO ₂ / population (tCO ₂ per capita)	0.8	0.8	0.8	0.9	1.0	1.0	1.0	14%
Share of electricity output from fossil fuels	79%	80%	80%	82%	81%	80%	81%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	681	699	663	645	625	622	620	-9%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	109	124	162	188	212	216	116%
Population index	100	115	130	146	166	184	189	89%
GDP PPP per population index	100	93	99	113	129	134	135	35%
Energy intensity index - TPES / GDP PPP	100	106	99	92	82	80	79	-21%
Carbon intensity index - CO ₂ / TPES	100	96	99	106	107	107	108	8%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	392.5	524.5	222.9	0.4	1 140.4	116%
Electricity and heat generation	276.2	74.0	134.0	-	484.2	125%
Other energy industry own use	41.4	10.8	31.2	-	83.3	171%
Manufacturing industries and construction	52.3	57.3	33.0	0.4	143.1	22%
Transport	0.0	311.1	2.4	-	313.5	180%
<i>of which: road</i>	-	299.2	0.8	-	300.0	181%
Other	22.5	71.3	22.4	-	116.2	118%
<i>of which: residential</i>	13.7	38.8	19.9	-	72.4	93%
<i>of which: services</i>	6.9	6.0	0.4	-	13.2	135%
<i>Memo: international marine bunkers</i>	-	19.9	-	-	19.9	19%
<i>Memo: international aviation bunkers</i>	-	21.8	-	-	21.8	85%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	299.2	180.4	4.7	4.7
Main activity prod. elec. and heat - coal	263.2	80.1	4.2	8.9
Main activity prod. elec. and heat - gas	127.1	406.8	2.0	10.9
Main activity prod. elec. and heat - oil	70.5	121.8	1.1	12.0
Manufacturing industries - oil	57.3	23.7	0.9	12.9
Manufacturing industries - coal	52.3	-13.2	0.8	13.8
Other energy industry - coal	41.4	+	0.7	14.4
Residential - oil	38.8	36.0	0.6	15.0
Manufacturing industries - gas	33.0	204.8	0.5	15.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>1140.4</i>	<i>115.6</i>	<i>18.0</i>	<i>18.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Americas

Figure 1. CO₂ emissions by fuel

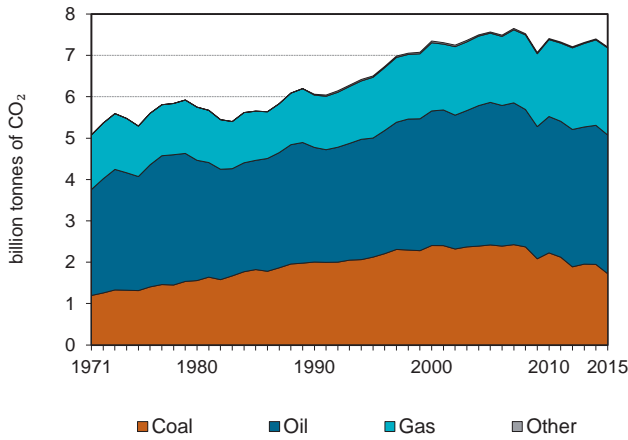


Figure 2. CO₂ emissions by sector

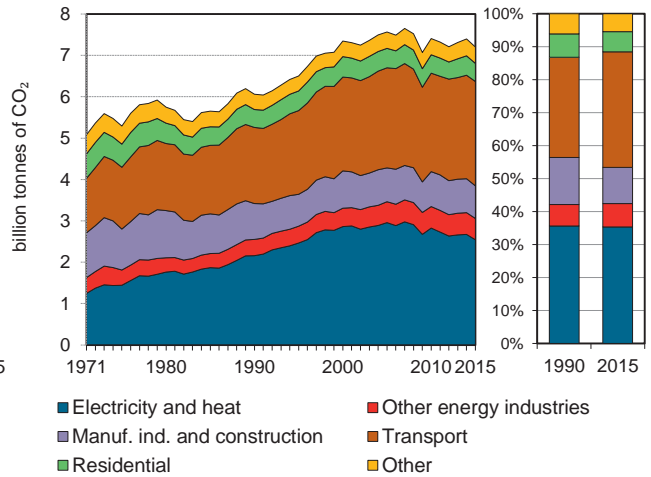


Figure 3. Electricity generation by fuel

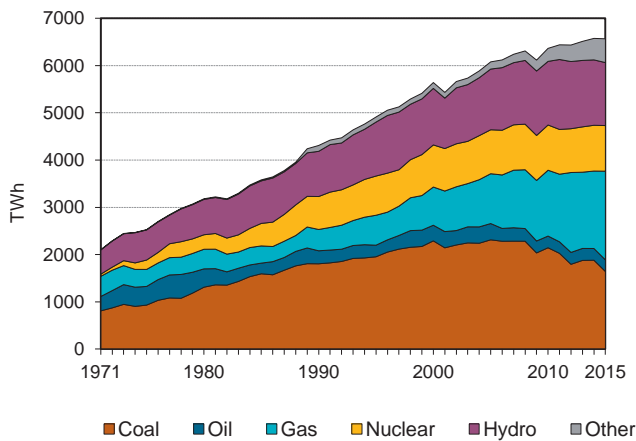


Figure 4. CO₂ from electricity generation: driving factors¹

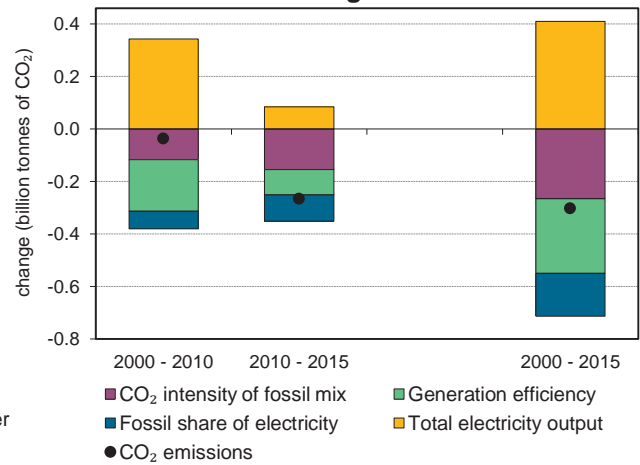


Figure 5. Changes in selected indicators

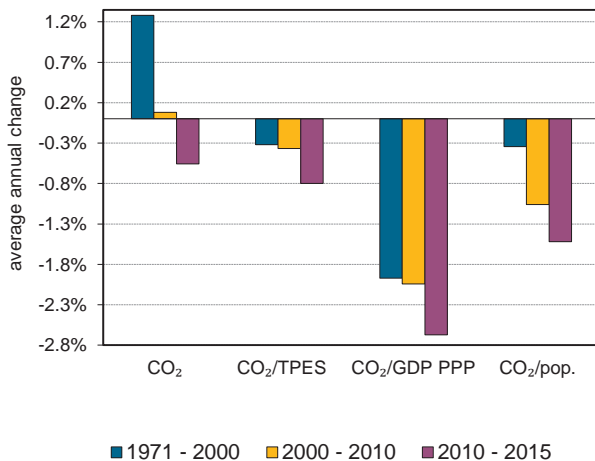
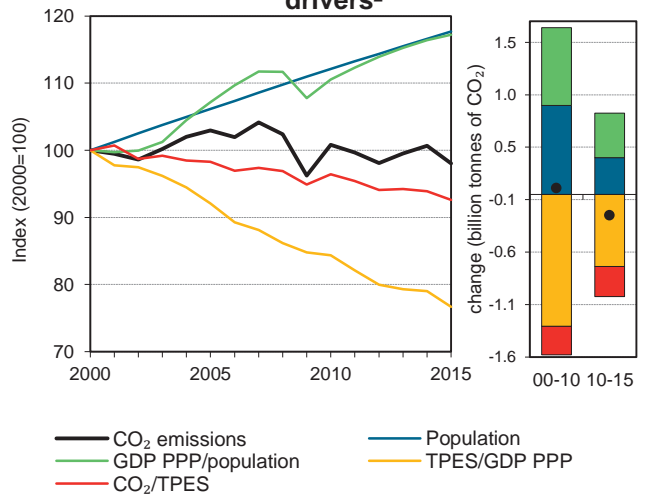


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Americas

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	6061.5	6 502.8	7 347.8	7 566.2	7 407.2	7 398.7	7 203.2	19%
Share of World CO ₂ from fuel combustion	30%	30%	32%	28%	24%	23%	22%	
TPES (PJ)	108474	118 132	130 932	137 146	136 905	140 431	138 568	28%
GDP (billion 2010 USD)	12869.5	14 671.1	17 832.6	20 258.0	21 816.7	23 802.1	24 207.1	88%
GDP PPP (billion 2010 USD)	14059	16 044.9	19 449.7	22 121.9	24 106.2	26 402.1	26 841.1	91%
Population (millions)	722.3	779.4	834.1	885.4	935.2	972.6	981.9	36%
CO ₂ / TPES (tCO ₂ per TJ)	55.9	55.0	56.1	55.2	54.1	52.7	52.0	-7%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.47	0.4	0.4	0.4	0.3	0.3	0.3	-37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.43	0.4	0.4	0.3	0.3	0.3	0.3	-38%
CO ₂ / population (tCO ₂ per capita)	8.4	8.3	8.8	8.5	7.9	7.6	7.3	-13%
Share of electricity output from fossil fuels	59%	58%	61%	61%	60%	58%	58%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	500	496	503	483	438	402	383	-23%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	107	121	125	122	122	119	19%
Population index	100	108	115	123	129	135	136	36%
GDP PPP per population index	100	106	120	128	132	139	140	40%
Energy intensity index - TPES / GDP PPP	100	95	87	80	74	69	67	-33%
Carbon intensity index - CO ₂ / TPES	100	99	100	99	97	94	93	-7%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	1 724.9	3 352.0	2 104.6	21.6	7 203.2	19%
Electricity and heat generation	1 548.7	173.5	804.9	17.3	2 544.4	18%
Other energy industry own use	15.6	202.7	296.0	-	514.3	31%
Manufacturing industries and construction	157.1	217.7	411.1	3.4	789.3	-9%
Transport	0.0	2 457.5	65.2	-	2 522.7	37%
<i>of which: road</i>	-	2 177.3	15.8	-	2 193.1	45%
Other	3.5	300.6	527.5	0.9	832.5	4%
<i>of which: residential</i>	0.3	119.4	318.0	-	437.7	1%
<i>of which: services</i>	2.7	60.3	204.0	0.9	267.9	1%
<i>Memo: international marine bunkers</i>	-	89.7	-	-	89.7	-22%
<i>Memo: international aviation bunkers</i>	-	112.6	-	-	112.6	99%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	2177.3	44.0	18.0	18.0
Main activity prod. elec. and heat - coal	1512.9	-9.1	12.5	30.4
Main activity prod. elec. and heat - gas	718.0	280.5	5.9	36.4
Manufacturing industries - gas	411.1	16.0	3.4	39.8
Residential - gas	318.0	13.8	2.6	42.4
Other energy industry own use - gas	296.0	77.6	2.4	44.8
Other transport - oil	280.2	-1.9	2.3	47.1
Manufacturing industries - oil	217.7	-12.8	1.8	48.9
Non-specified other - gas	209.5	23.9	1.7	50.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>7203.2</i>	<i>18.8</i>	<i>59.4</i>	<i>59.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Asia

Figure 1. CO₂ emissions by fuel

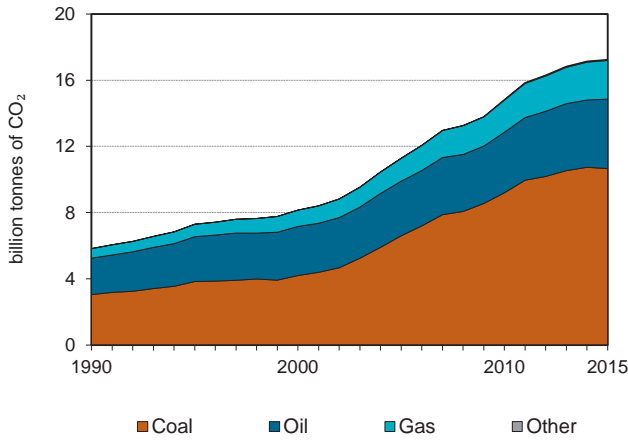


Figure 2. CO₂ emissions by sector

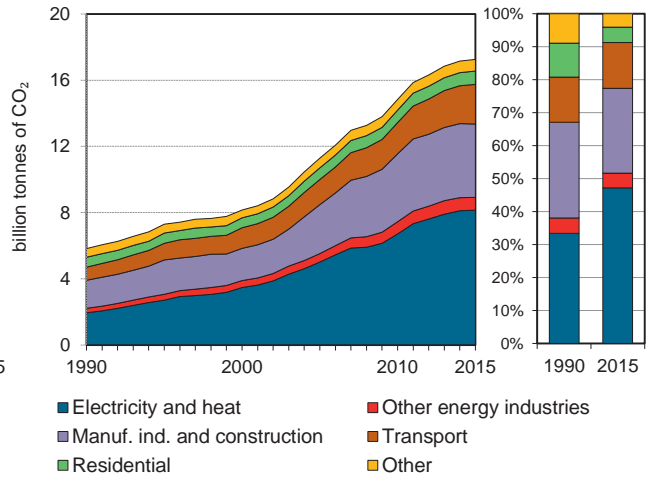


Figure 3. Electricity generation by fuel

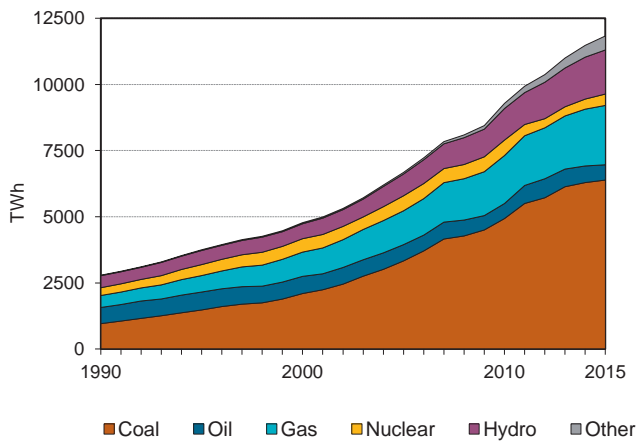


Figure 4. CO₂ from electricity generation: driving factors¹

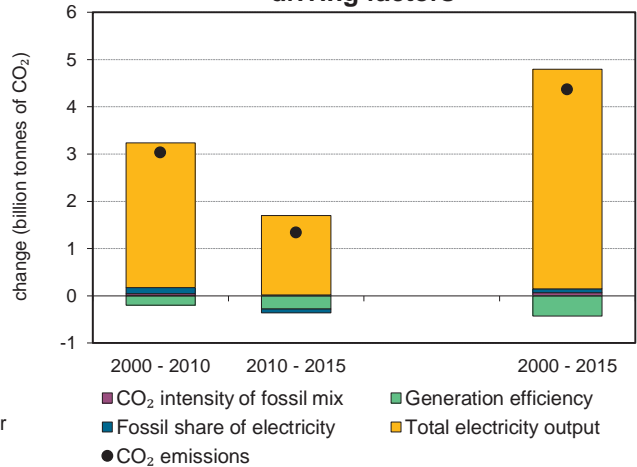


Figure 5. Changes in selected indicators

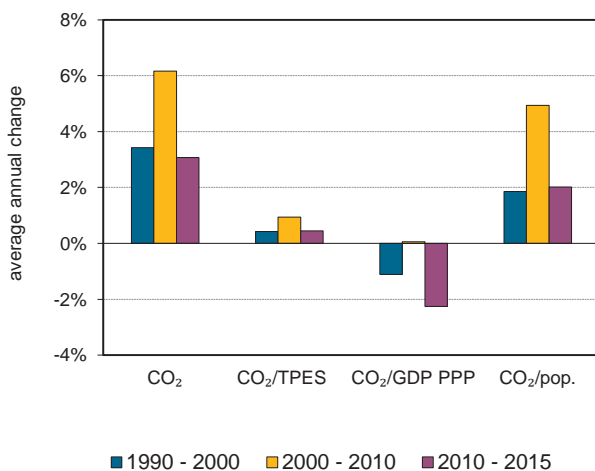
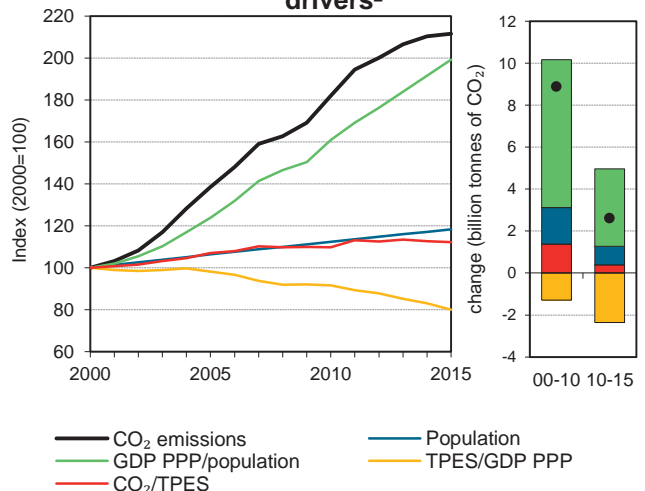


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Asia

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	5824.2	7 299.0	8 156.1	11 290.2	14 839.5	17 157.6	17 258.6	196%
Share of World CO ₂ from fuel combustion	28%	34%	35%	42%	49%	53%	53%	
TPES (PJ)	107755	128 730	144 626	187 056	239 760	269 852	272 665	153%
GDP (billion 2010 USD)	9022.6	10 967.7	13 036.7	16 252.1	20 896.6	25 205.9	26 311.6	192%
GDP PPP (billion 2010 USD)	13364.9	16 915.2	20 917.1	27 542.2	37 830.7	46 955.0	49 320.1	269%
Population (millions)	3179.9	3 448.1	3 703.7	3 938.6	4 163.2	4 338.9	4 382.8	38%
CO ₂ / TPES (tCO ₂ per TJ)	54.1	56.7	56.4	60.4	61.9	63.6	63.3	17%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.65	0.7	0.6	0.7	0.7	0.7	0.7	2%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.44	0.4	0.4	0.4	0.4	0.4	0.3	-20%
CO ₂ / population (tCO ₂ per capita)	1.8	2.1	2.2	2.9	3.6	4.0	3.9	115%
Share of electricity output from fossil fuels	73%	74%	77%	78%	79%	79%	78%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	640	673	672	693	668	653	635	-1%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	125	140	194	255	295	296	196%
Population index	100	108	116	124	131	136	138	38%
GDP PPP per population index	100	117	134	166	216	257	268	168%
Energy intensity index - TPES / GDP PPP	100	94	86	84	79	71	69	-31%
Carbon intensity index - CO ₂ / TPES	100	105	104	112	115	118	117	17%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	10 660.2	4 194.5	2 343.6	60.3	17 258.6	196%
Electricity and heat generation	6 499.5	502.0	1 106.2	41.4	8 149.1	319%
Other energy industry own use	268.9	243.5	258.0	-	770.4	185%
Manufacturing industries and construction	3 363.8	554.6	498.6	17.3	4 434.4	162%
Transport	9.9	2 299.8	84.4	-	2 394.1	202%
<i>of which: road</i>	-	2 061.6	75.0	-	2 136.6	219%
Other	518.2	594.5	396.4	1.5	1 510.6	35%
<i>of which: residential</i>	228.7	295.1	283.1	-	807.0	35%
<i>of which: services</i>	121.8	128.0	106.3	1.5	357.7	110%
<i>Memo: international marine bunkers</i>	-	347.8	-	-	347.8	214%
<i>Memo: international aviation bunkers</i>	-	222.1	-	-	222.1	197%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	5960.4	435.6	21.7	21.7
Manufacturing industries - coal	3363.8	186.3	12.3	34.0
Road - oil	2061.6	208.0	7.5	41.5
Main activity prod. elec. and heat - gas	956.9	298.2	3.5	45.0
Manufacturing industries - oil	554.6	34.1	2.0	47.0
Unallocated autoproducers - coal	539.1	641.9	2.0	49.0
Manufacturing industries - gas	498.6	381.8	1.8	50.8
Main activity prod. elec. and heat - oil	408.0	-2.4	1.5	52.3
Non-specified other - oil	299.4	13.9	1.1	53.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>17258.6</i>	<i>196.3</i>	<i>63.0</i>	<i>63.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Europe

Figure 1. CO₂ emissions by fuel

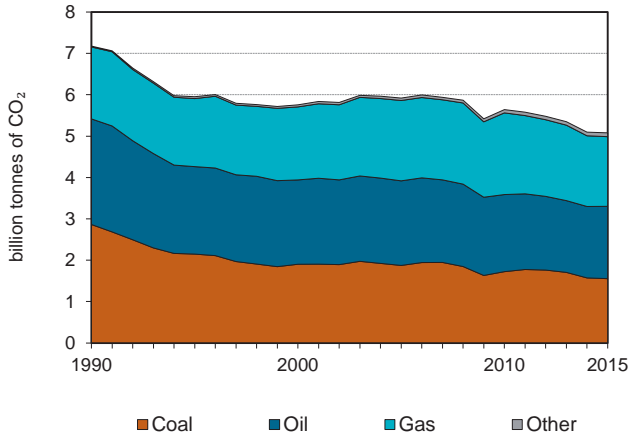


Figure 2. CO₂ emissions by sector

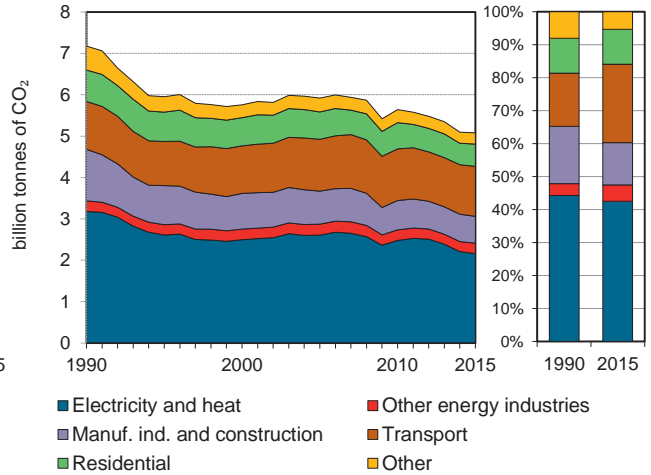


Figure 3. Electricity generation by fuel

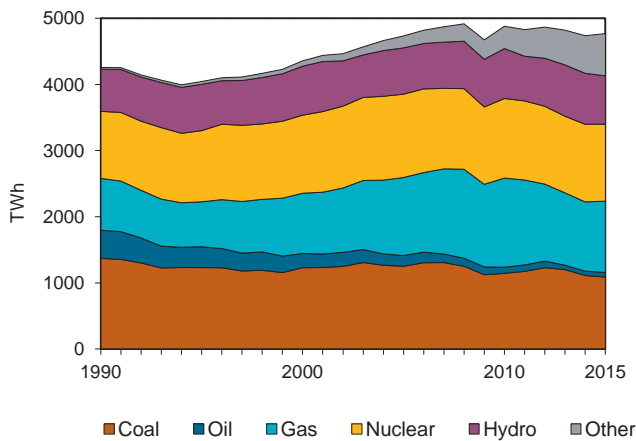


Figure 4. CO₂ from electricity generation: driving factors¹

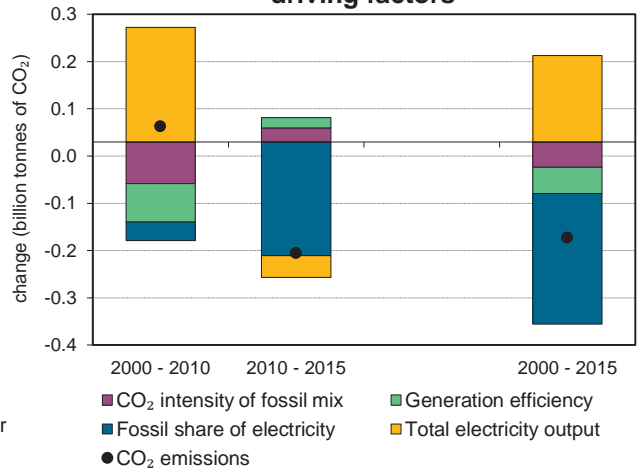


Figure 5. Changes in selected indicators

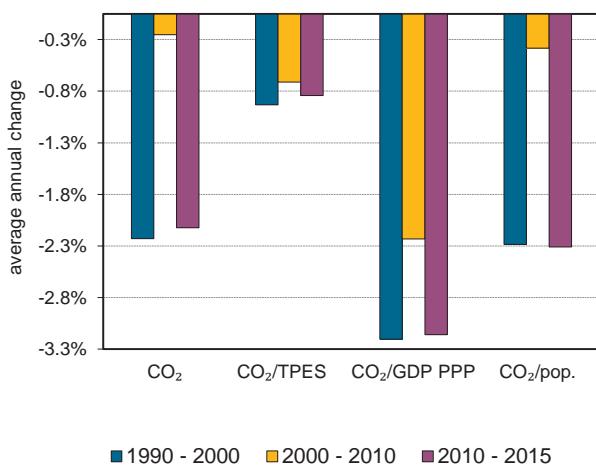
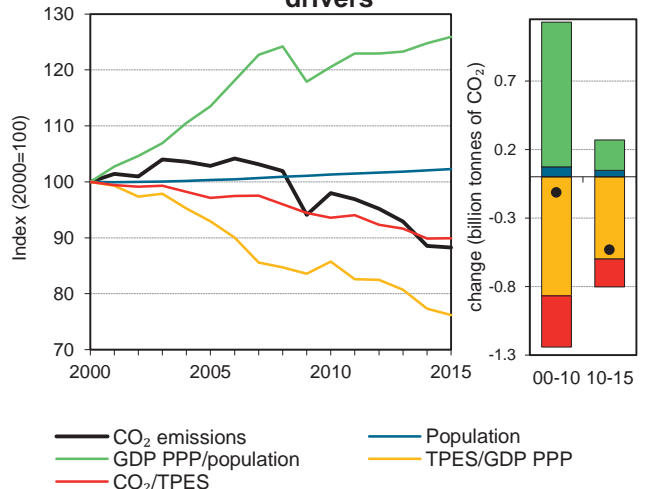


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Europe

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	7176.7	5 952.8	5 757.1	5 920.4	5 641.3	5 096.7	5 080.0	-29%
Share of World CO ₂ from fuel combustion	35%	28%	25%	22%	19%	16%	16%	
TPES (PJ)	121901	106 582	106 848	113 105	111 884	105 271	104 835	-14%
GDP (billion 2010 USD)	14357.8	14 614.6	16 801.2	18 774.9	19 887.9	20 660.2	20 977.6	46%
GDP PPP (billion 2010 USD)	15619	15 082.8	17 264.8	19 664.0	21 089.3	21 987.7	22 238.8	42%
Population (millions)	722.6	727.5	726.6	729.1	736.2	741.5	743.2	3%
CO ₂ / TPES (tCO ₂ per TJ)	58.9	55.9	53.9	52.3	50.4	48.4	48.5	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.5	0.4	0.3	0.3	0.3	0.2	0.2	-52%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.46	0.4	0.3	0.3	0.3	0.2	0.2	-50%
CO ₂ / population (tCO ₂ per capita)	9.9	8.2	7.9	8.1	7.7	6.9	6.8	-31%
Share of electricity output from fossil fuels	61%	55%	54%	55%	54%	48%	48%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	476	425	394	395	361	332	329	-31%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	83	80	82	79	71	71	-29%
Population index	100	101	101	101	102	103	103	3%
GDP PPP per population index	100	96	110	125	133	137	138	38%
Energy intensity index - TPES / GDP PPP	100	91	79	74	68	61	60	-40%
Carbon intensity index - CO ₂ / TPES	100	95	92	89	86	82	82	-18%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	1 555.3	1 748.4	1 683.8	92.5	5 080.0	-29%
Electricity and heat generation	1 242.5	84.8	767.6	65.1	2 160.0	-32%
Other energy industry own use	42.0	132.1	76.5	1.8	252.4	-2%
Manufacturing industries and construction	206.6	138.6	280.7	23.4	649.1	-48%
Transport	0.1	1 131.2	76.6	-	1 207.9	4%
<i>of which: road</i>	-	1 062.1	4.5	-	1 066.6	12%
Other	64.2	261.7	482.3	2.3	810.5	-39%
<i>of which: residential</i>	48.3	133.8	356.5	0.0	538.6	-29%
<i>of which: services</i>	10.7	57.6	112.2	2.0	182.4	-42%
<i>Memo: international marine bunkers</i>	-	195.8	-	-	195.8	55%
<i>Memo: international aviation bunkers</i>	-	158.7	-	-	158.7	45%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	1103.0	-30.2	14.7	14.7
Road - oil	1062.1	12.2	14.2	28.9
Main activity prod. elec. and heat - gas	551.4	-3.4	7.3	36.2
Residential - gas	356.5	13.2	4.8	41.0
Manufacturing industries - gas	280.7	-22.6	3.7	44.7
Unallocated autoproducers - gas	216.2	-9.9	2.9	47.6
Manufacturing industries - coal	206.6	-63.0	2.8	50.3
Unallocated autoproducers - coal	139.5	-47.1	1.9	52.2
Manufacturing industries - oil	138.6	-56.6	1.8	54.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>5080.0</i>	<i>-29.2</i>	<i>67.7</i>	<i>67.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Oceania

Figure 1. CO₂ emissions by fuel

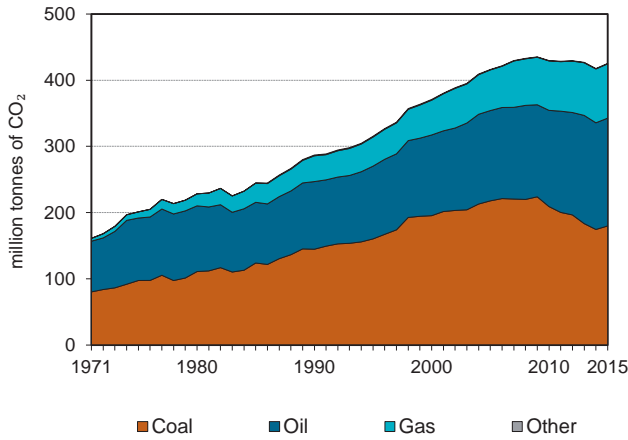


Figure 2. CO₂ emissions by sector

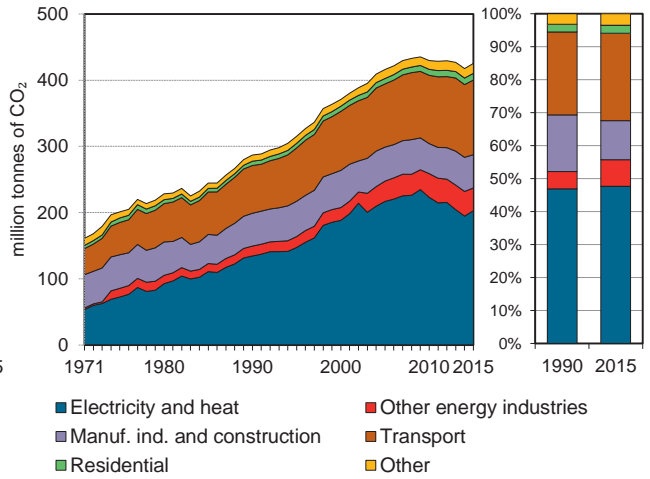


Figure 3. Electricity generation by fuel

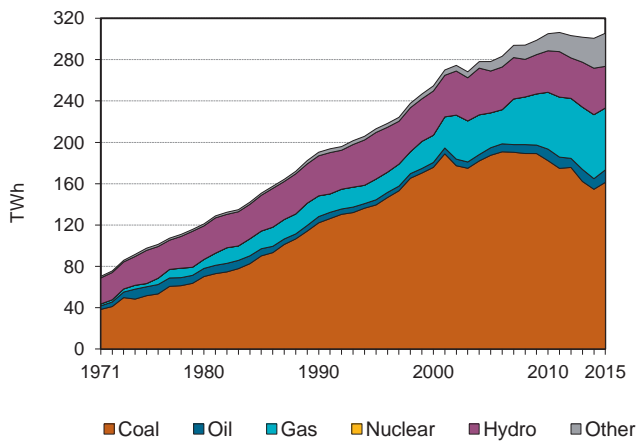


Figure 4. CO₂ from electricity generation: driving factors¹

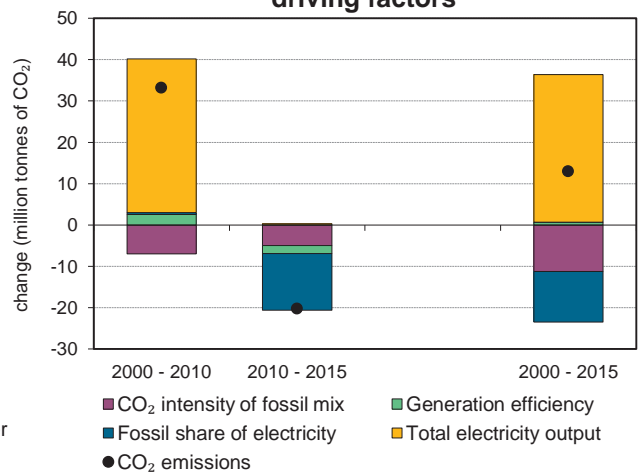


Figure 5. Changes in selected indicators

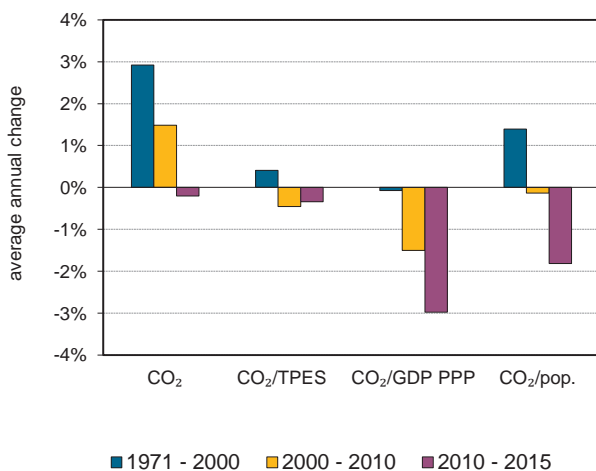
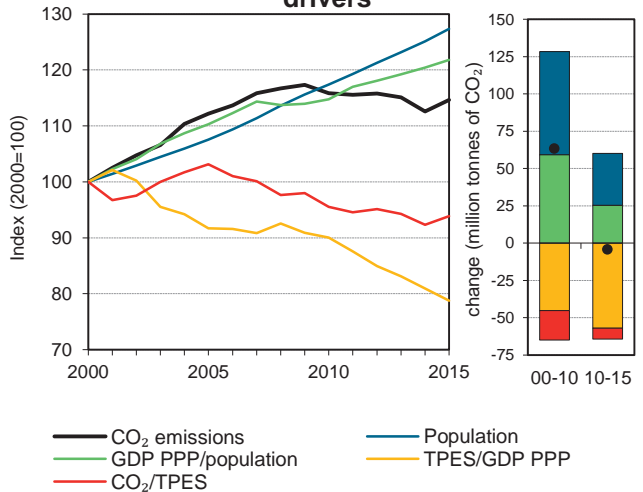


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Oceania

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	287	315.3	371.0	416.2	429.7	417.7	425.4	48%
Share of World CO ₂ from fuel combustion	1%	1%	2%	2%	1%	1%	1%	
TPES (PJ)	4301	4 665	5 208	5 666	6 315	6 349	6 360	48%
GDP (billion 2010 USD)	772.8	907.8	1 088.4	1 291.2	1 467.8	1 639.6	1 686.5	118%
GDP PPP (billion 2010 USD)	585.8	689.0	823.7	977.0	1 109.6	1 241.0	1 277.4	118%
Population (millions)	26.6	28.6	30.7	33.0	36.0	38.4	39.0	47%
CO ₂ / TPES (tCO ₂ per TJ)	66.7	67.6	71.2	73.5	68.0	65.8	66.9	0%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.37	0.3	0.3	0.3	0.3	0.3	0.3	-32%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.49	0.5	0.5	0.4	0.4	0.3	0.3	-32%
CO ₂ / population (tCO ₂ per capita)	10.8	11.0	12.1	12.6	11.9	10.9	10.9	1%
Share of electricity output from fossil fuels	78%	77%	81%	82%	81%	75%	76%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	705	691	740	780	731	648	664	-6%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	110	129	145	150	146	148	48%
Population index	100	108	115	124	135	144	147	47%
GDP PPP per population index	100	109	122	135	140	147	149	49%
Energy intensity index - TPES / GDP PPP	100	92	86	79	78	70	68	-32%
Carbon intensity index - CO ₂ / TPES	100	101	107	110	102	99	100	0%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	179.8	162.9	82.1	0.6	425.4	48%
Electricity and heat generation	161.7	10.1	31.0	-	202.9	51%
Other energy industry own use	5.4	11.5	17.4	-	34.4	130%
Manufacturing industries and construction	12.3	16.3	21.0	0.6	50.2	1%
Transport	0.0	112.2	0.6	-	112.8	56%
<i>of which: road</i>	-	95.4	0.2	-	95.7	50%
Other	0.3	12.7	12.0	-	25.1	59%
<i>of which: residential</i>	0.0	1.5	8.5	-	10.1	55%
<i>of which: services</i>	0.1	2.9	3.3	-	6.3	63%
<i>Memo: international marine bunkers</i>	-	3.8	-	-	3.8	12%
<i>Memo: international aviation bunkers</i>	-	14.6	-	-	14.6	137%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	160.2	38.6	15.5	15.5
Road - oil	95.4	49.9	9.3	24.8
Main activity prod. elec. and heat - gas	24.5	145.3	2.4	27.2
Manufacturing industries - gas	21.0	31.5	2.0	29.2
Other energy industry own use - gas	17.4	248.0	1.7	30.9
Other transport - oil	16.8	106.9	1.6	32.5
Manufacturing industries - oil	16.3	60.3	1.6	34.1
Manufacturing industries - coal	12.3	-44.6	1.2	35.3
Other energy industry own use - oil	11.5	57.0	1.1	36.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>425.4</i>	<i>48.2</i>	<i>41.3</i>	<i>41.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OTHER REGIONAL TOTALS

OECD Total

Figure 1. CO₂ emissions by fuel

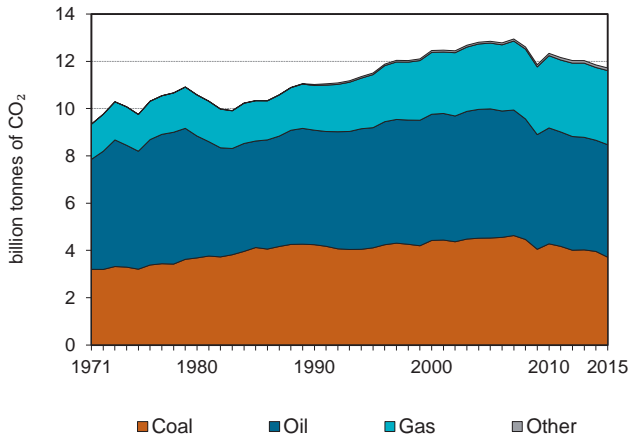


Figure 2. CO₂ emissions by sector

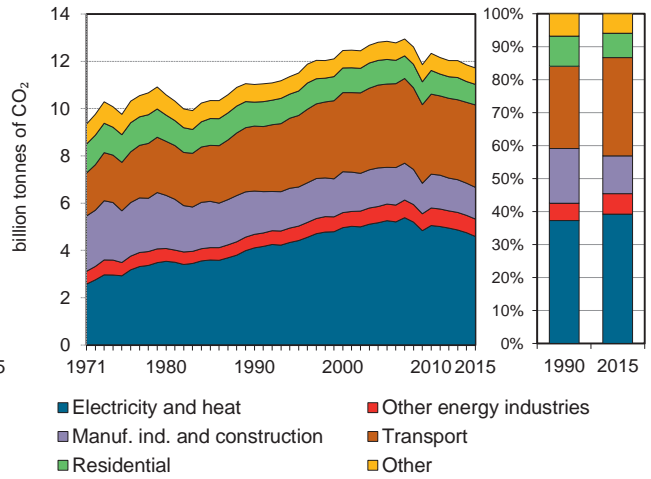


Figure 3. Electricity generation by fuel

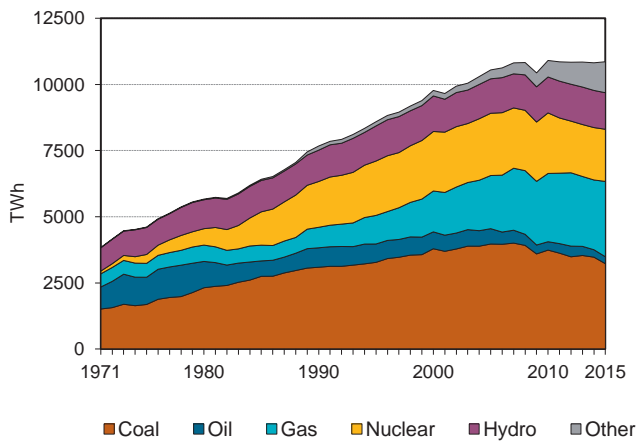


Figure 4. CO₂ from electricity generation: driving factors¹

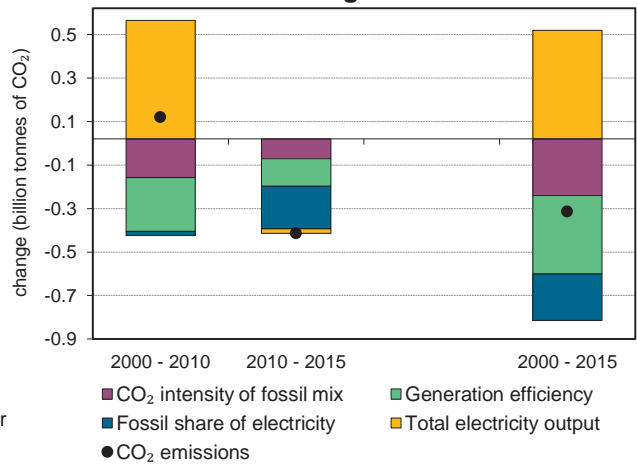


Figure 5. Changes in selected indicators

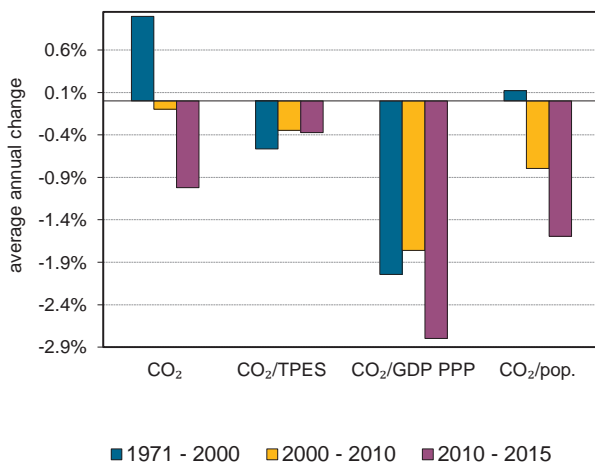
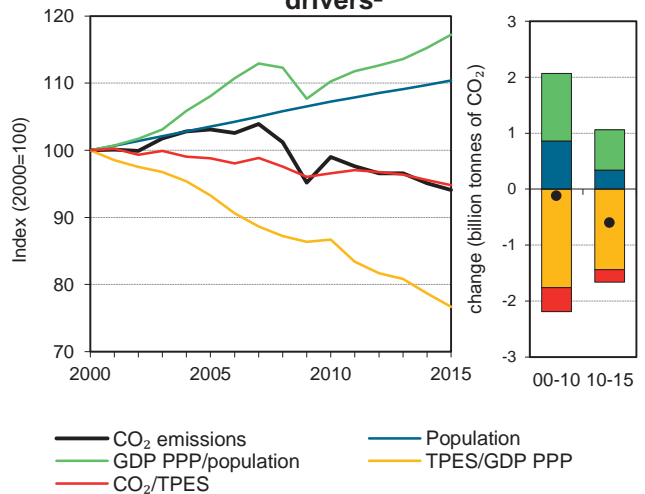


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

OECD Total

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	11020.3	11 504.8	12 457.9	12 847.0	12 336.4	11 848.2	11 720.2	6%
Share of World CO ₂ from fuel combustion	54%	54%	54%	48%	41%	37%	36%	
TPES (PJ)	189882	204 487	221 885	231 612	227 496	220 801	220 203	16%
GDP (billion 2010 USD)	29343.8	32 544.2	38 277.1	42 617.4	44 737.1	47 671.5	48 750.4	66%
GDP PPP (billion 2010 USD)	28088.4	31 169.5	36 873.3	41 257.4	43 602.5	46 639.6	47 730.9	70%
Population (millions)	1072.8	1 117.1	1 156.4	1 197.0	1 240.1	1 269.1	1 276.7	19%
CO ₂ / TPES (tCO ₂ per TJ)	58	56.3	56.1	55.5	54.2	53.7	53.2	-8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.38	0.4	0.3	0.3	0.3	0.2	0.2	-36%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.39	0.4	0.3	0.3	0.3	0.3	0.2	-37%
CO ₂ / population (tCO ₂ per capita)	10.3	10.3	10.8	10.7	9.9	9.3	9.2	-11%
Share of electricity output from fossil fuels	60%	59%	61%	63%	61%	60%	59%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	508	493	489	478	442	421	404	-20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	113	117	112	108	106	6%
Population index	100	104	108	112	116	118	119	19%
GDP PPP per population index	100	107	122	132	134	140	143	43%
Energy intensity index - TPES / GDP PPP	100	97	89	83	77	70	68	-32%
Carbon intensity index - CO ₂ / TPES	100	97	97	96	93	92	92	-8%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	3 714.0	4 760.2	3 134.6	111.4	11 720.2	6%
Electricity and heat generation	3 116.3	194.1	1 212.1	68.2	4 590.7	12%
Other energy industry own use	116.4	306.3	313.7	0.4	736.8	29%
Manufacturing industries and construction	406.2	293.6	604.6	39.1	1 343.6	-27%
Transport	0.0	3 426.2	59.1	-	3 485.4	27%
<i>of which: road</i>	-	3 084.6	9.6	-	3 094.1	32%
Other	75.1	540.0	945.1	3.6	1 563.7	-11%
<i>of which: residential</i>	46.9	235.6	586.0	0.0	868.5	-14%
<i>of which: services</i>	23.9	153.8	343.0	3.6	524.3	-3%
<i>Memo: international marine bunkers</i>	-	225.1	-	-	225.1	-5%
<i>Memo: international aviation bunkers</i>	-	285.6	-	-	285.6	99%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	3084.6	31.7	18.4	18.4
Main activity prod. elec. and heat - coal	2949.4	1.9	17.6	35.9
Main activity prod. elec. and heat - gas	1064.2	218.5	6.3	42.3
Manufacturing industries - gas	604.6	13.7	3.6	45.9
Residential - gas	586.0	25.2	3.5	49.4
Manufacturing industries - coal	406.2	-45.8	2.4	51.8
Non-specified other - gas	359.0	38.2	2.1	53.9
Other transport - oil	341.7	-5.4	2.0	55.9
Other energy industry own use - gas	313.7	86.8	1.9	57.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>11720.2</i>	<i>6.4</i>	<i>69.8</i>	<i>69.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Americas

Figure 1. CO₂ emissions by fuel

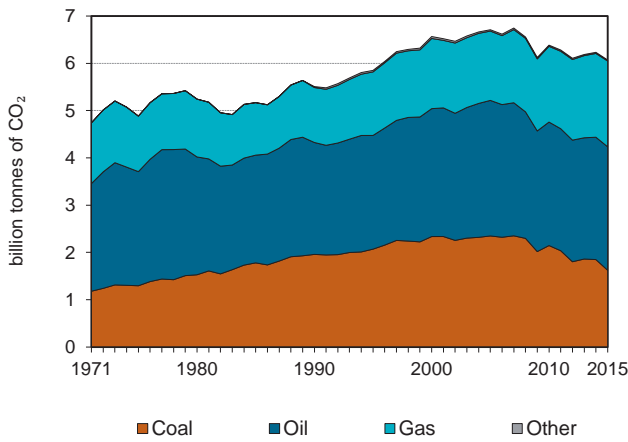


Figure 2. CO₂ emissions by sector

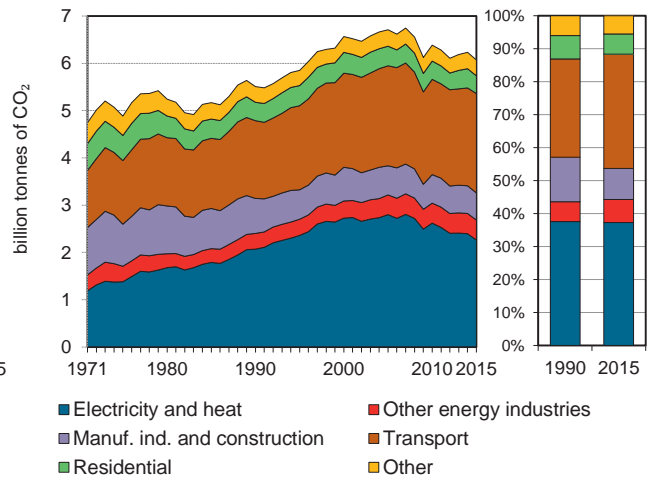


Figure 3. Electricity generation by fuel

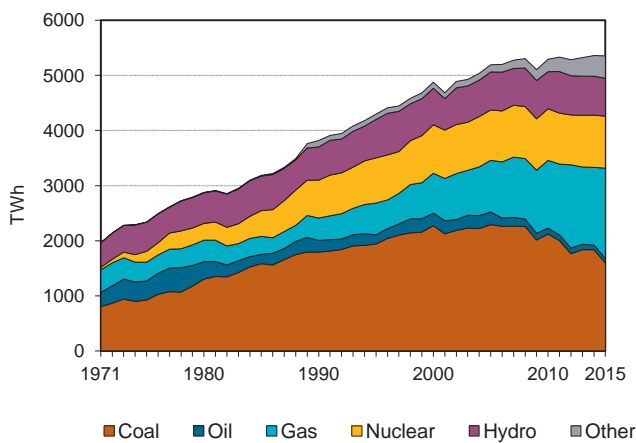


Figure 4. CO₂ from electricity generation: driving factors¹

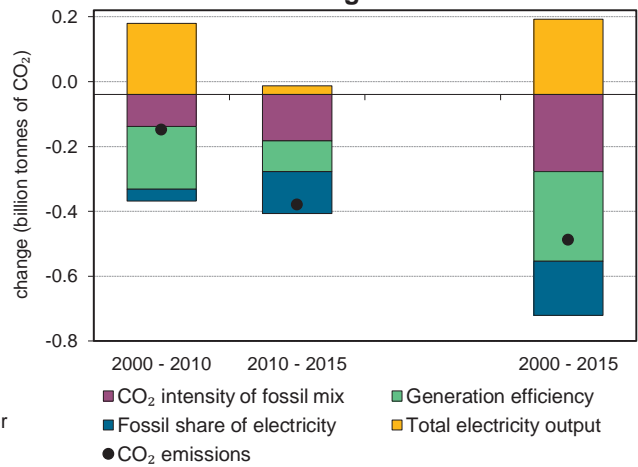


Figure 5. Changes in selected indicators

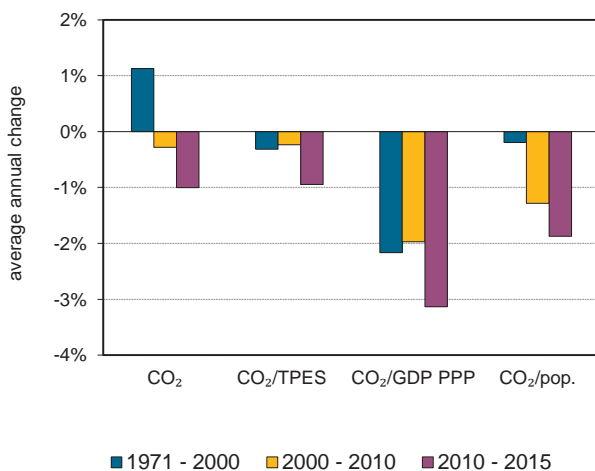
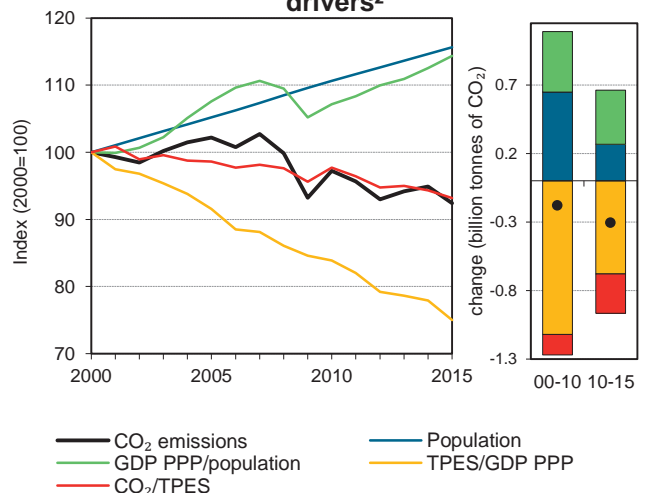


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

OECD Americas

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	5508.3	5 850.4	6 567.0	6 710.2	6 384.4	6 232.4	6 070.7	10%
Share of World CO ₂ from fuel combustion	27%	27%	28%	25%	21%	19%	19%	
TPES (PJ)	94790	102 630	113 167	117 235	112 618	113 840	112 288	18%
GDP (billion 2010 USD)	10772.6	12 184.0	15 069.9	17 067.4	17 845.3	19 391.3	19 864.7	84%
GDP PPP (billion 2010 USD)	11046.9	12 492.8	15 485.0	17 524.3	18 366.2	19 985.5	20 478.7	85%
Population (millions)	378.1	404.8	429.4	451.7	475.2	492.3	496.6	31%
CO ₂ / TPES (tCO ₂ per TJ)	58.1	57.0	58.0	57.2	56.7	54.7	54.1	-7%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.51	0.5	0.4	0.4	0.4	0.3	0.3	-40%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.3	0.3	0.3	-41%
CO ₂ / population (tCO ₂ per capita)	14.6	14.5	15.3	14.9	13.4	12.7	12.2	-16%
Share of electricity output from fossil fuels	63%	63%	66%	67%	66%	63%	62%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	541	542	554	535	488	442	417	-23%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	119	122	116	113	110	10%
Population index	100	107	114	119	126	130	131	31%
GDP PPP per population index	100	106	123	133	132	139	141	41%
Energy intensity index - TPES / GDP PPP	100	96	85	78	71	66	64	-36%
Carbon intensity index - CO ₂ / TPES	100	98	100	98	98	94	93	-7%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	1 622.8	2 611.8	1 814.5	21.6	6 070.7	10%
Electricity and heat generation	1 495.0	63.3	687.8	17.3	2 263.5	9%
Other energy industry own use	13.1	167.4	241.2	-	421.7	27%
Manufacturing industries and construction	111.9	117.9	341.2	3.4	574.4	-22%
Transport	-	2 054.0	47.5	-	2 101.5	28%
<i>of which: road</i>	-	1 799.0	2.4	-	1 801.4	35%
Other	2.7	209.2	496.8	0.9	709.6	-2%
<i>of which: residential</i>	0.0	83.2	292.1	-	375.3	-3%
<i>of which: services</i>	2.7	52.2	199.3	0.9	255.1	1%
<i>Memo: international marine bunkers</i>	-	44.6	-	-	44.6	-53%
<i>Memo: international aviation bunkers</i>	-	85.2	-	-	85.2	78%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	1799.0	34.9	19.7	19.7
Main activity prod. elec. and heat - coal	1479.0	-10.7	16.2	35.9
Main activity prod. elec. and heat - gas	615.4	274.0	6.7	42.6
Manufacturing industries - gas	341.2	5.6	3.7	46.4
Residential - gas	292.1	8.3	3.2	49.6
Other transport - oil	255.0	-4.6	2.8	52.4
Other energy industry own use - gas	241.2	73.4	2.6	55.0
Non-specified other - gas	204.7	24.3	2.2	57.2
Other energy industry own use - oil	167.4	-9.9	1.8	59.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>6070.7</i>	<i>10.2</i>	<i>66.5</i>	<i>66.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Asia Oceania

Figure 1. CO₂ emissions by fuel

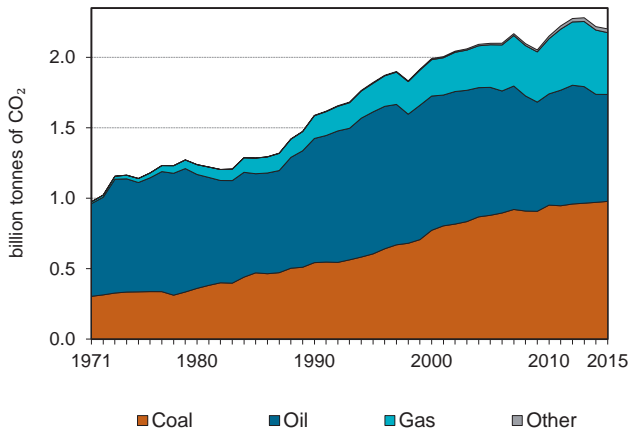


Figure 2. CO₂ emissions by sector

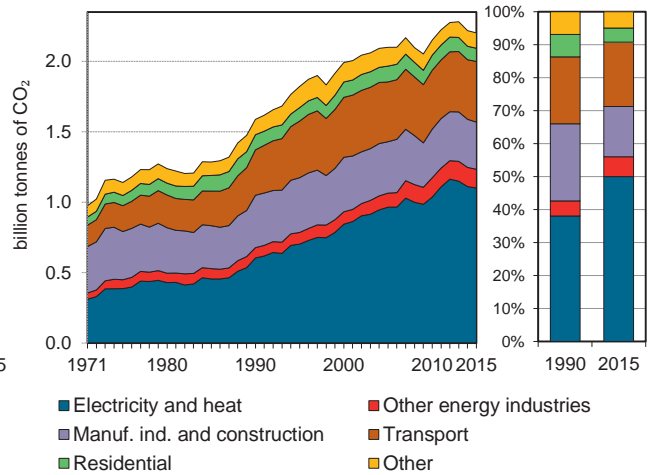


Figure 3. Electricity generation by fuel

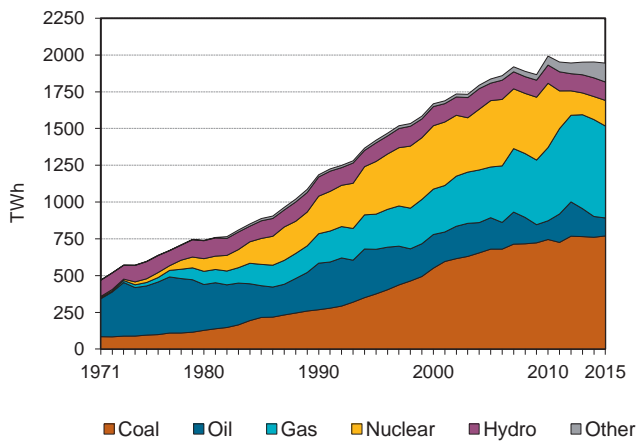


Figure 4. CO₂ from electricity generation: driving factors¹

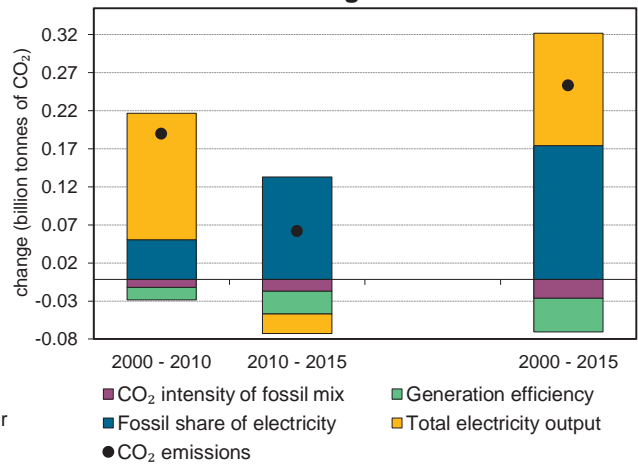


Figure 5. Changes in selected indicators

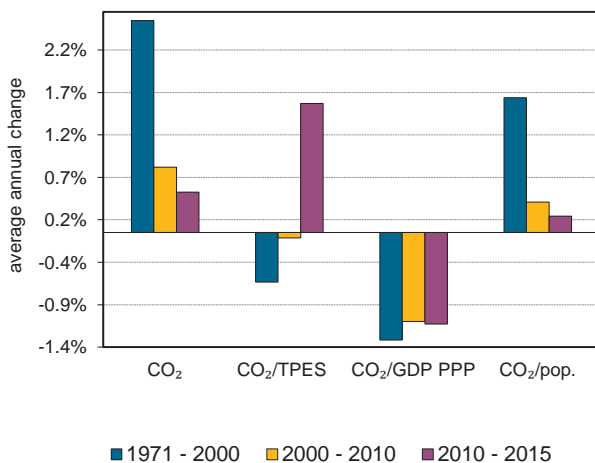
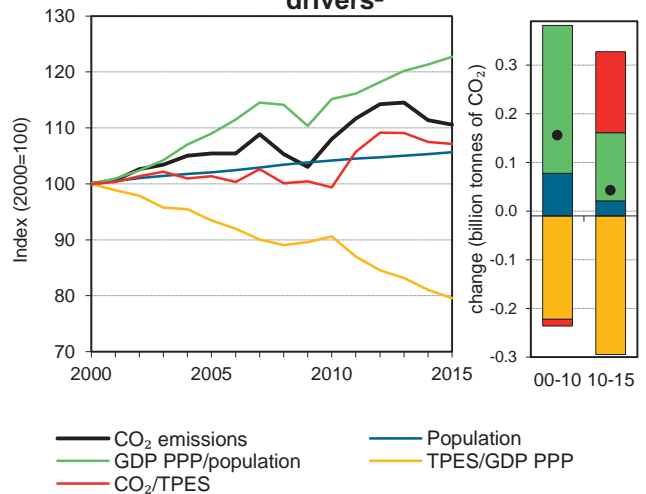


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

OECD Asia Oceania

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	1588	1 821.2	1 991.5	2 099.6	2 150.4	2 218.0	2 201.9	39%
Share of World CO ₂ from fuel combustion	8%	9%	9%	8%	7%	7%	7%	
TPES (PJ)	26887	31 884	35 358	36 769	38 425	36 629	36 483	36%
GDP (billion 2010 USD)	5897.2	6 626.8	7 296.1	8 022.7	8 468.7	9 026.5	9 183.0	56%
GDP PPP (billion 2010 USD)	4734.2	5 376.4	5 938.3	6 604.8	7 123.5	7 588.3	7 698.4	63%
Population (millions)	191.7	197.9	203.2	207.4	211.7	214.0	214.7	12%
CO ₂ / TPES (tCO ₂ per TJ)	59.1	57.1	56.3	57.1	56.0	60.6	60.4	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.3	0.3	0.2	0.2	-11%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.3	0.3	0.3	0.3	-15%
CO ₂ / population (tCO ₂ per capita)	8.3	9.2	9.8	10.1	10.2	10.4	10.3	24%
Share of electricity output from fossil fuels	66%	65%	65%	67%	69%	80%	78%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	509	492	501	517	512	560	557	9%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	115	125	132	135	140	139	39%
Population index	100	103	106	108	110	112	112	12%
GDP PPP per population index	100	110	118	129	136	144	145	45%
Energy intensity index - TPES / GDP PPP	100	104	105	98	95	85	83	-17%
Carbon intensity index - CO ₂ / TPES	100	97	95	97	95	103	102	2%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	977.0		759.5	439.1	2 201.9	39%
Electricity and heat generation	745.9		82.6	265.0	1 100.5	82%
Other energy industry own use	61.1		49.5	22.5	133.1	82%
Manufacturing industries and construction	165.2		86.4	65.7	335.2	-10%
Transport	0.0		427.4	3.5	430.9	34%
<i>of which: road</i>	-		385.7	3.1	388.8	39%
Other	4.8		113.7	82.3	202.3	-7%
<i>of which: residential</i>	2.7		42.7	48.0	93.4	-13%
<i>of which: services</i>	1.9		51.5	34.0	88.8	-1%
<i>Memo: international marine bunkers</i>	-		48.6	-	48.6	81%
<i>Memo: international aviation bunkers</i>	-		49.5	-	49.5	129%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	649.6	167.8	20.7	20.7
Road - oil	385.7	37.6	12.3	32.9
Main activity prod. elec. and heat - gas	240.5	160.1	7.7	40.6
Manufacturing industries - coal	165.2	-7.1	5.3	45.9
Unallocated autoproducers - coal	96.3	79.6	3.1	48.9
Manufacturing industries - oil	86.4	-48.2	2.7	51.7
Non-specified other - oil	71.0	-23.7	2.3	53.9
Manufacturing industries - gas	65.7	164.7	2.1	56.0
Other energy industry - coal	61.1	125.7	1.9	58.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>2201.9</i>	<i>38.7</i>	<i>70.1</i>	<i>70.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Europe

Figure 1. CO₂ emissions by fuel

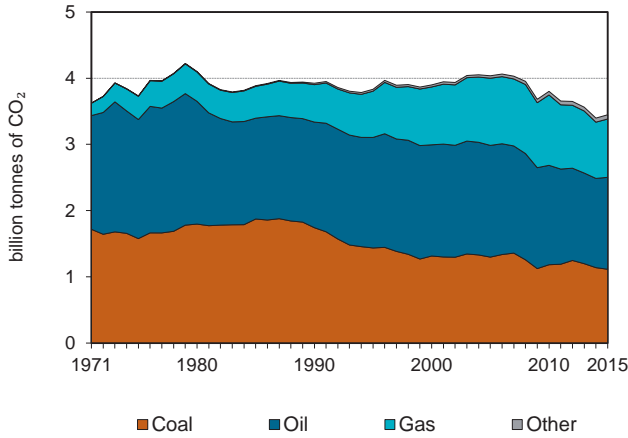


Figure 2. CO₂ emissions by sector

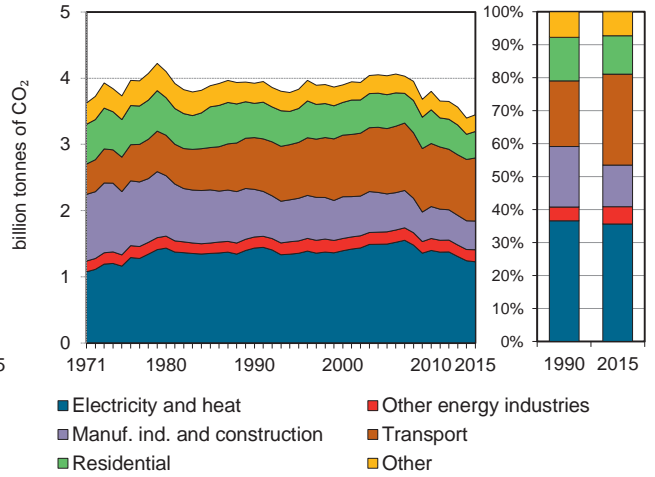


Figure 3. Electricity generation by fuel

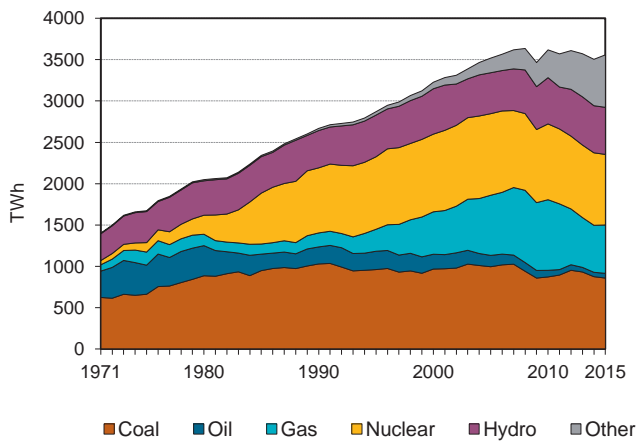


Figure 4. CO₂ from electricity generation: driving factors¹

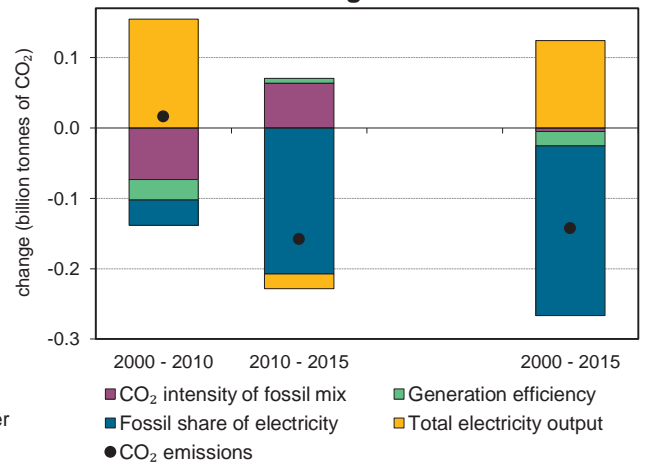


Figure 5. Changes in selected indicators

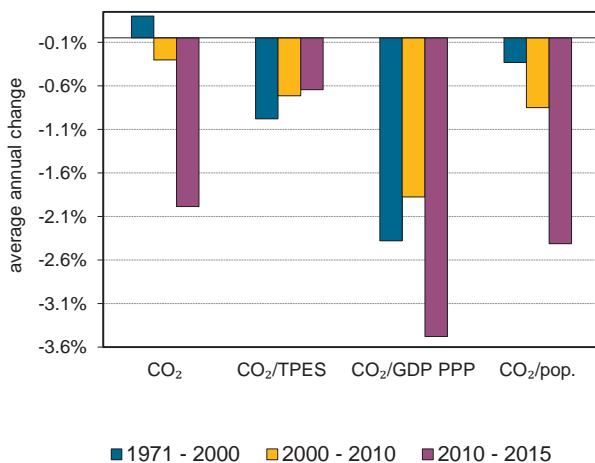
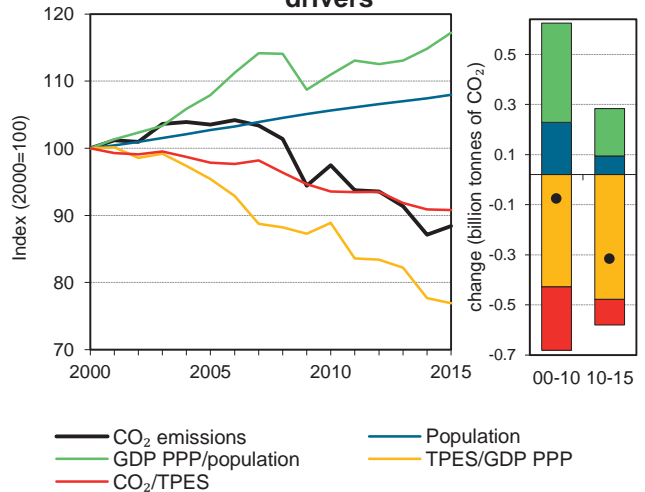


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

OECD Europe

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	3924.1	3 833.2	3 899.4	4 037.2	3 801.6	3 397.8	3 447.6	-12%
Share of World CO ₂ from fuel combustion	19%	18%	17%	15%	12%	11%	11%	
TPES (PJ)	68204	69 973	73 361	77 607	76 453	70 332	71 432	5%
GDP (billion 2010 USD)	12674	13 733.3	15 911.1	17 527.3	18 423.0	19 253.8	19 702.8	55%
GDP PPP (billion 2010 USD)	12307.3	13 300.2	15 450.0	17 128.3	18 112.7	19 065.8	19 553.9	59%
Population (millions)	503	514.4	523.8	538.0	553.3	562.8	565.5	12%
CO ₂ / TPES (tCO ₂ per TJ)	57.5	54.8	53.2	52.0	49.7	48.3	48.3	-16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.31	0.3	0.2	0.2	0.2	0.2	0.2	-43%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.32	0.3	0.3	0.2	0.2	0.2	0.2	-45%
CO ₂ / population (tCO ₂ per capita)	7.8	7.5	7.4	7.5	6.9	6.0	6.1	-22%
Share of electricity output from fossil fuels	53%	51%	52%	54%	51%	44%	43%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	461	419	385	373	336	312	302	-35%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	98	99	103	97	87	88	-12%
Population index	100	102	104	107	110	112	112	12%
GDP PPP per population index	100	106	121	130	134	138	141	41%
Energy intensity index - TPES / GDP PPP	100	95	86	82	76	67	66	-34%
Carbon intensity index - CO ₂ / TPES	100	95	92	90	86	84	84	-16%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	1 114.2	1 388.9	881.1	63.5	3 447.6	-12%
Electricity and heat generation	875.4	48.2	259.3	43.9	1 226.8	-14%
Other energy industry own use	42.1	89.4	50.0	0.4	182.0	9%
Manufacturing industries and construction	129.1	89.3	197.7	17.9	434.0	-40%
Transport	0.0	944.9	8.1	-	953.0	22%
<i>of which: road</i>	-	899.9	4.1	-	904.0	24%
Other	67.5	217.1	365.9	1.3	651.9	-21%
<i>of which: residential</i>	44.1	109.7	245.9	0.0	399.8	-23%
<i>of which: services</i>	19.3	50.1	109.7	1.3	180.3	-9%
<i>Memo: international marine bunkers</i>	-	132.0	-	-	132.0	16%
<i>Memo: international aviation bunkers</i>	-	151.0	-	-	151.0	104%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	899.9	23.6	19.0	19.0
Main activity prod. elec. and heat - coal	820.8	-17.5	17.4	36.4
Residential - gas	245.9	40.3	5.2	41.6
Main activity prod. elec. and heat - gas	208.3	170.2	4.4	46.0
Manufacturing industries - gas	197.7	7.7	4.2	50.2
Manufacturing industries - coal	129.1	-61.6	2.7	53.0
Non-specified other - gas	120.1	43.6	2.5	55.5
Residential - oil	109.7	-45.3	2.3	57.8
Non-specified other - oil	107.4	-31.4	2.3	60.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>3447.6</i>	<i>-12.1</i>	<i>73.0</i>	<i>73.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-OECD Total

Figure 1. CO₂ emissions by fuel

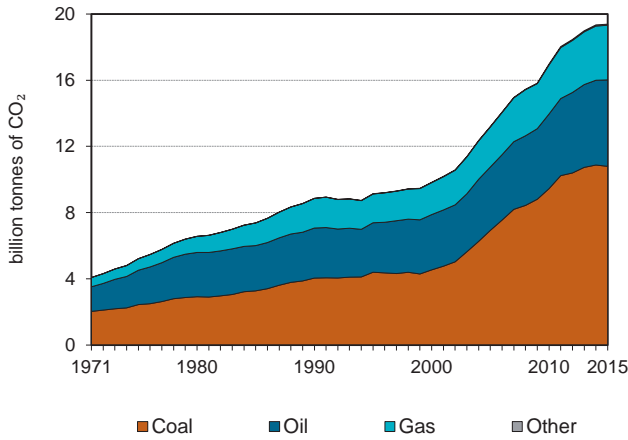


Figure 2. CO₂ emissions by sector

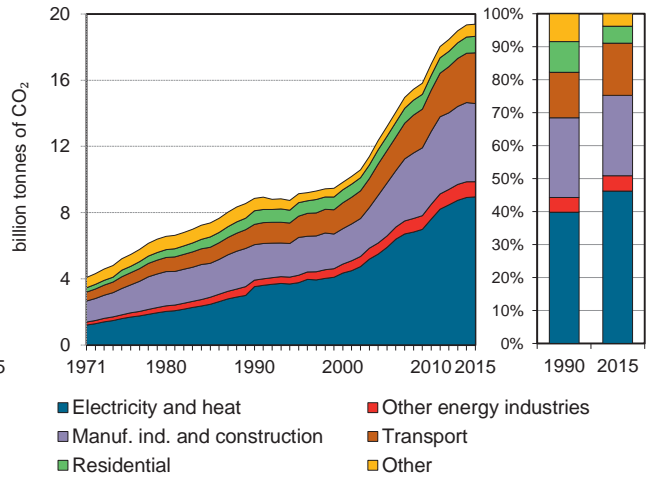


Figure 3. Electricity generation by fuel

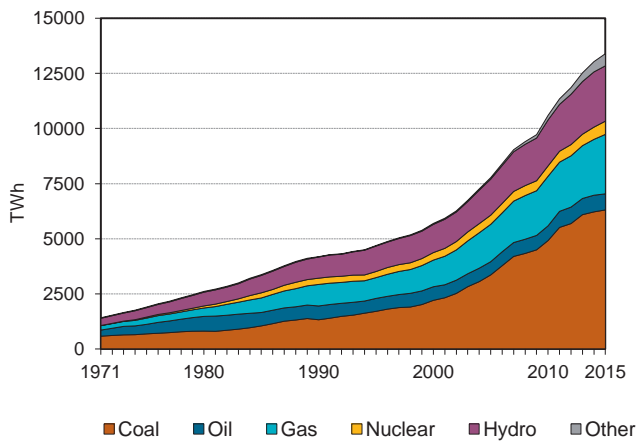


Figure 4. CO₂ from electricity generation: driving factors¹

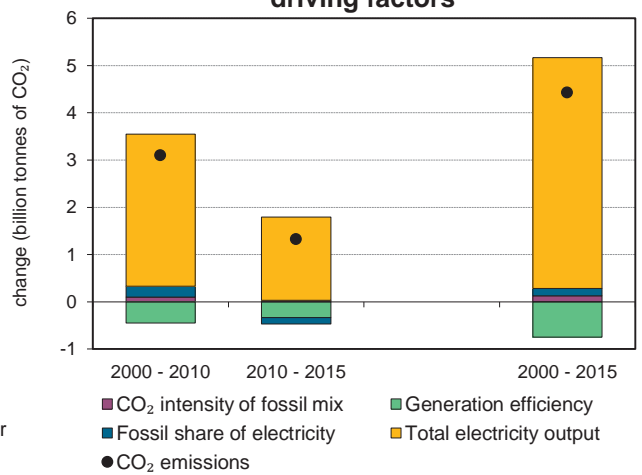


Figure 5. Changes in selected indicators

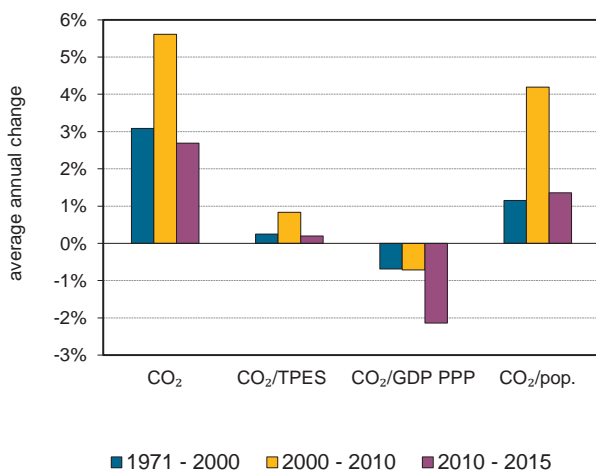
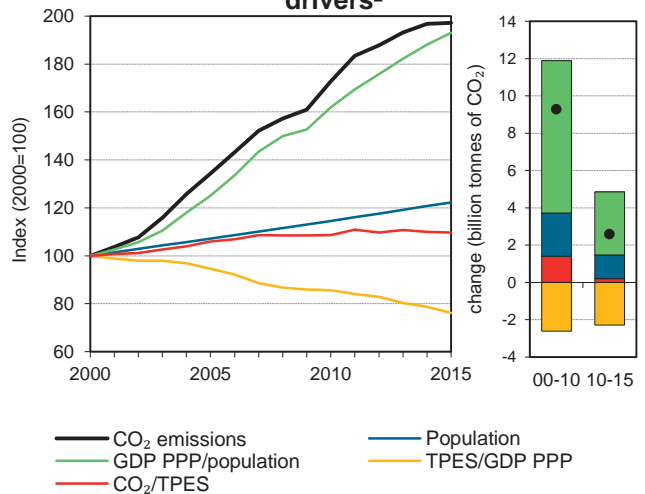


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Non-OECD Total

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	8858	9 141.4	9 832.3	13 203.3	16 977.3	19 344.2	19 387.3	119%
Share of World CO ₂ from fuel combustion	43%	43%	42%	49%	56%	60%	60%	
TPES (PJ)	169000	172 211	186 478	236 480	296 452	333 564	335 201	98%
GDP (billion 2010 USD)	8605.2	9 591.7	11 646.5	15 469.4	21 281.0	25 875.6	26 738.5	211%
GDP PPP (billion 2010 USD)	17646.5	19 803.1	24 278.9	32 533.4	45 049.9	55 133.8	57 304.3	225%
Population (millions)	4206.7	4 586.5	4 952.3	5 308.0	5 673.1	5 978.2	6 057.0	44%
CO ₂ / TPES (tCO ₂ per TJ)	52.4	53.1	52.7	55.8	57.3	58.0	57.8	10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.03	1.0	0.8	0.9	0.8	0.7	0.7	-30%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.4	0.4	0.3	-33%
CO ₂ / population (tCO ₂ per capita)	2.1	2.0	2.0	2.5	3.0	3.2	3.2	52%
Share of electricity output from fossil fuels	70%	69%	71%	73%	74%	73%	73%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	577	606	608	639	621	601	589	2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	103	111	149	192	218	219	119%
Population index	100	109	118	126	135	142	144	44%
GDP PPP per population index	100	103	117	146	189	220	226	126%
Energy intensity index - TPES / GDP PPP	100	91	80	76	69	63	61	-39%
Carbon intensity index - CO ₂ / TPES	100	101	101	107	109	111	110	10%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	10 798.7	5 222.2	3 302.4	64.0	19 387.3	119%
Electricity and heat generation	6 612.3	650.4	1 631.6	55.6	8 949.9	154%
Other energy industry own use	256.8	294.4	365.3	1.4	918.0	133%
Manufacturing industries and construction	3 385.8	690.9	639.8	6.0	4 722.6	120%
Transport	10.0	2 885.6	170.1	..	3 065.7	150%
<i>of which: road</i>	..	2 611.1	86.7	..	2 697.8	181%
Other	533.7	700.8	495.5	1.0	1 731.1	10%
<i>of which: residential</i>	244.3	353.0	400.0	..	997.4	21%
<i>of which: services</i>	118.3	101.0	83.3	0.7	303.3	39%
<i>Memo: international marine bunkers</i>	..	431.9	..	..	431.9	219%
<i>Memo: international aviation bunkers</i>	..	244.1	..	..	244.1	111%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	6050.3	250.8	16.2	16.2
Manufacturing industries - coal	3385.8	154.9	9.1	25.2
Road - oil	2611.1	173.2	7.0	32.2
Main activity prod. elec. and heat - gas	1313.6	87.5	3.5	35.7
Manufacturing industries - oil	690.9	38.9	1.8	37.6
Manufacturing industries - gas	639.8	102.4	1.7	39.3
Unallocated autoproducers - coal	562.0	310.0	1.5	40.8
Main activity prod. elec. and heat - oil	539.1	-10.2	1.4	42.2
Residential - gas	400.0	125.6	1.1	43.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>19387.3</i>	<i>118.9</i>	<i>51.9</i>	<i>51.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-OECD Europe and Eurasia

Figure 1. CO₂ emissions by fuel

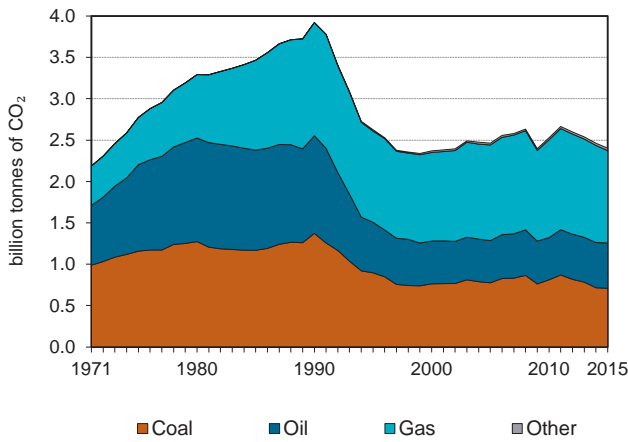


Figure 2. CO₂ emissions by sector

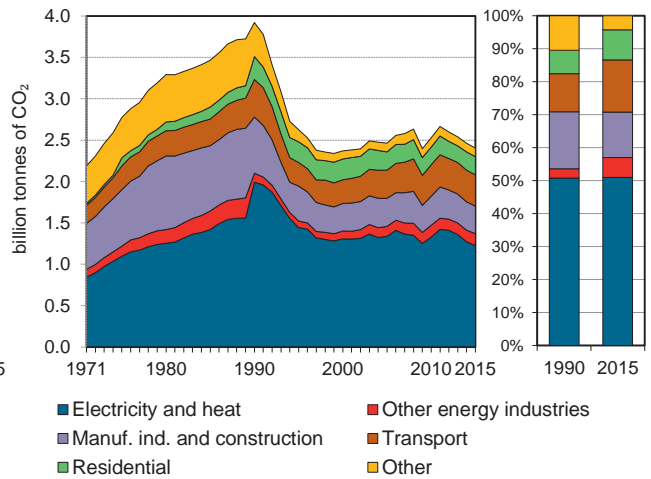


Figure 3. Electricity generation by fuel

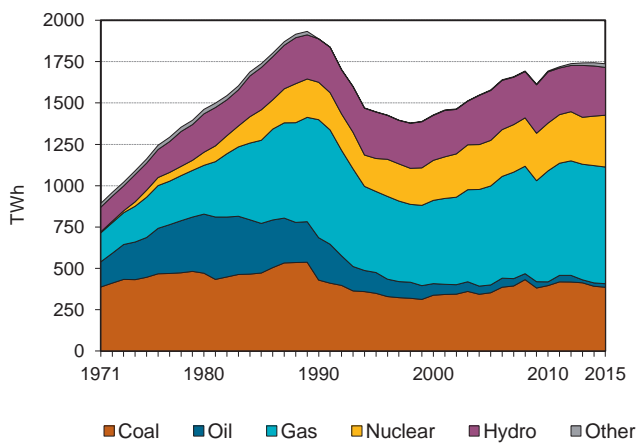


Figure 4. CO₂ from electricity generation: driving factors¹

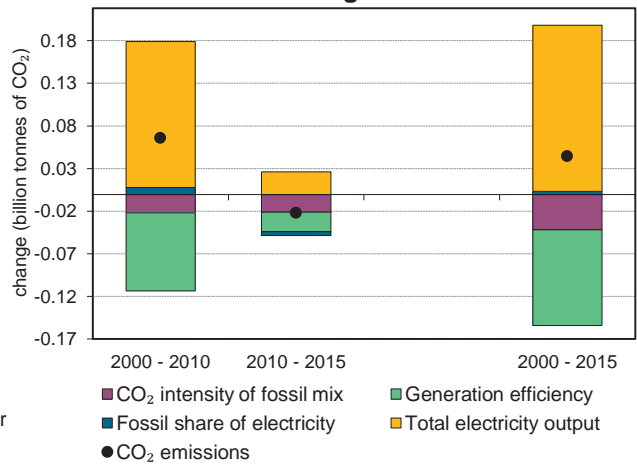


Figure 5. Changes in selected indicators

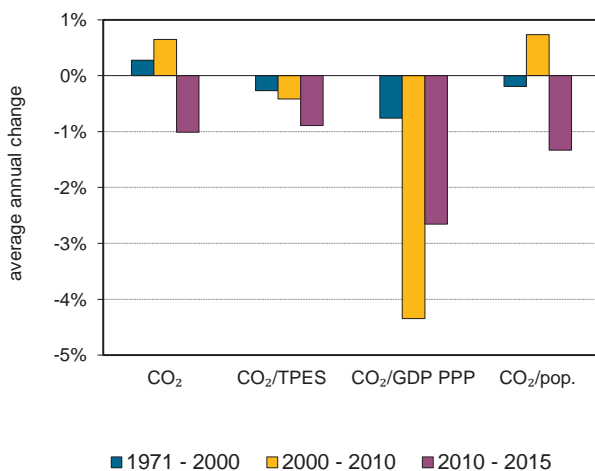
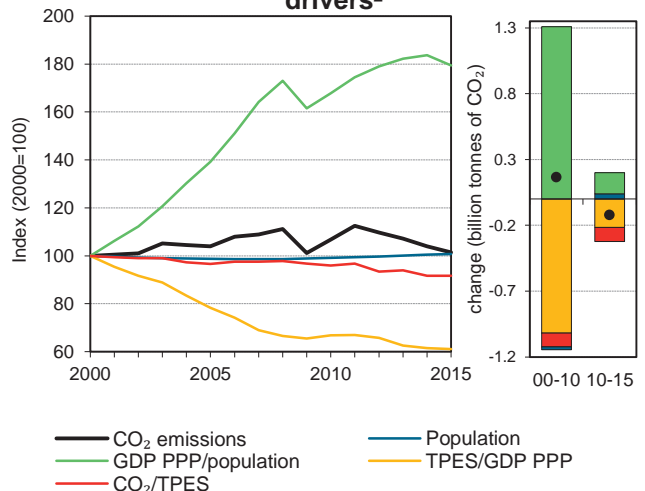


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Non-OECD Europe and Eurasia

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	3921.3	2 625.9	2 370.1	2 463.4	2 528.7	2 462.8	2 403.4	-39%
Share of World CO ₂ from fuel combustion	19%	12%	10%	9%	8%	8%	7%	
TPES (PJ)	64037	44 807	41 866	45 013	46 578	47 454	46 293	-28%
GDP (billion 2010 USD)	2247.6	1 430.1	1 557.2	2 127.1	2 556.5	2 824.8	2 766.6	23%
GDP PPP (billion 2010 USD)	4373.6	2 756.6	2 997.7	4 118.2	4 986.1	5 528.2	5 421.1	24%
Population (millions)	341	342.3	338.4	334.1	335.6	339.9	341.0	0%
CO ₂ / TPES (tCO ₂ per TJ)	61.2	58.6	56.6	54.7	54.3	51.9	51.9	-15%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.74	1.8	1.5	1.2	1.0	0.9	0.9	-50%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.9	1.0	0.8	0.6	0.5	0.4	0.4	-51%
CO ₂ / population (tCO ₂ per capita)	11.5	7.7	7.0	7.4	7.5	7.2	7.0	-39%
Share of electricity output from fossil fuels	74%	67%	64%	63%	65%	65%	64%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	508	457	448	460	434	415	416	-18%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	67	60	63	64	63	61	-39%
Population index	100	100	99	98	98	100	100	0%
GDP PPP per population index	100	63	69	96	116	127	124	24%
Energy intensity index - TPES / GDP PPP	100	111	95	75	64	59	58	-42%
Carbon intensity index - CO ₂ / TPES	100	96	92	89	89	85	85	-15%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	708.7	547.8	1 117.3	29.6	2 403.4	-39%
Electricity and heat generation	529.7	44.6	629.8	21.6	1 225.7	-38%
Other energy industry own use	7.6	52.6	82.0	1.4	143.6	31%
Manufacturing industries and construction	137.0	66.8	123.3	5.5	332.7	-51%
Transport	0.2	301.9	77.2	..	379.2	-16%
<i>of which: road</i>	..	270.2	2.1	..	272.3	-5%
Other	34.3	81.9	205.0	1.0	322.3	-53%
<i>of which: residential</i>	20.9	33.1	165.8	..	219.8	-20%
<i>of which: services</i>	9.5	11.9	33.8	0.7	56.0	-57%
<i>Memo: international marine bunkers</i>	..	67.7	..	..	67.7	449%
<i>Memo: international aviation bunkers</i>	..	23.1	..	..	23.1	-46%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	463.0	-17.3	11.4	11.4
Main activity prod. elec. and heat - coal	444.8	-37.7	11.0	22.4
Road - oil	270.2	-5.2	6.7	29.0
Unallocated autoproducers - gas	166.8	-23.4	4.1	33.2
Residential - gas	165.8	10.8	4.1	37.2
Manufacturing industries - coal	137.0	-56.8	3.4	40.6
Manufacturing industries - gas	123.3	-38.7	3.0	43.7
Unallocated autoproducers - coal	84.9	-16.3	2.1	45.8
Other energy industry own use - gas	82.0	128.3	2.0	47.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>2403.4</i>	<i>-38.7</i>	<i>59.3</i>	<i>59.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Asia (excluding China)

Figure 1. CO₂ emissions by fuel

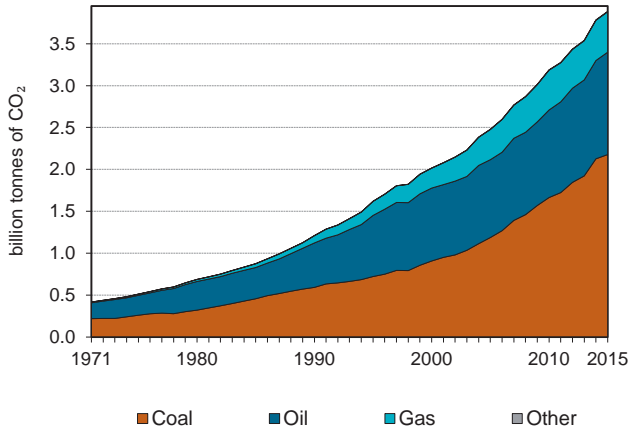


Figure 2. CO₂ emissions by sector

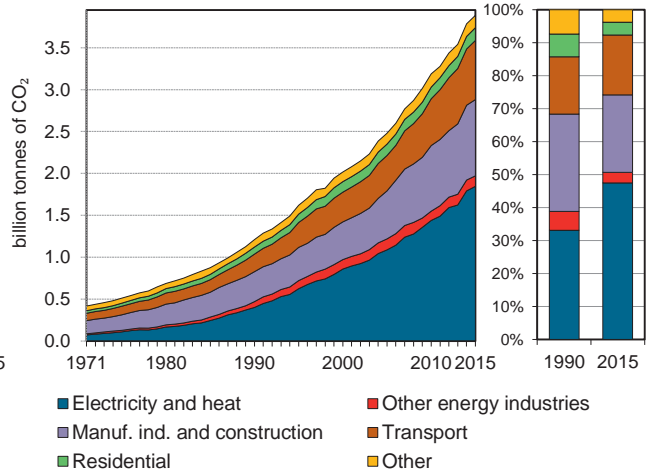


Figure 3. Electricity generation by fuel

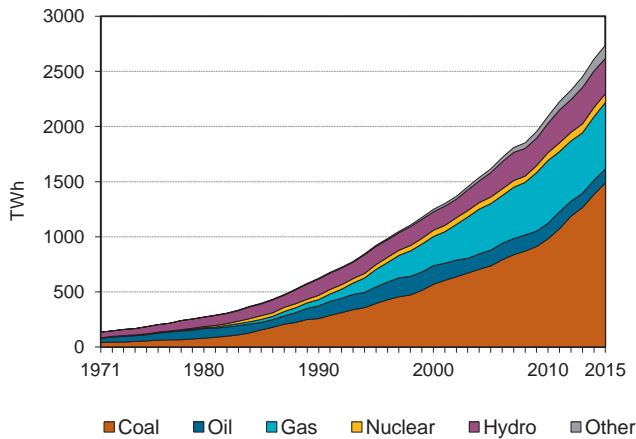


Figure 4. CO₂ from electricity generation: driving factors¹

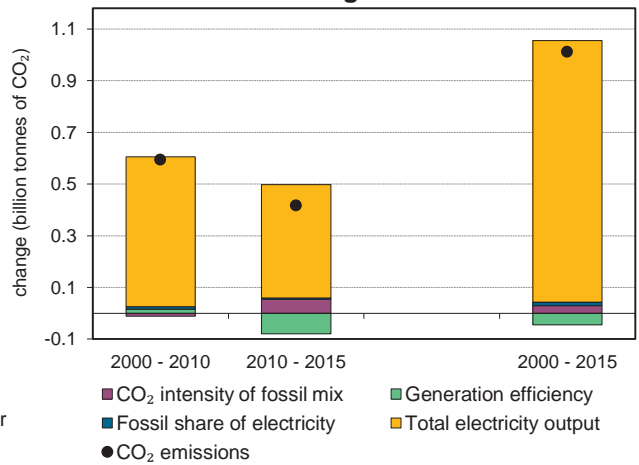


Figure 5. Changes in selected indicators

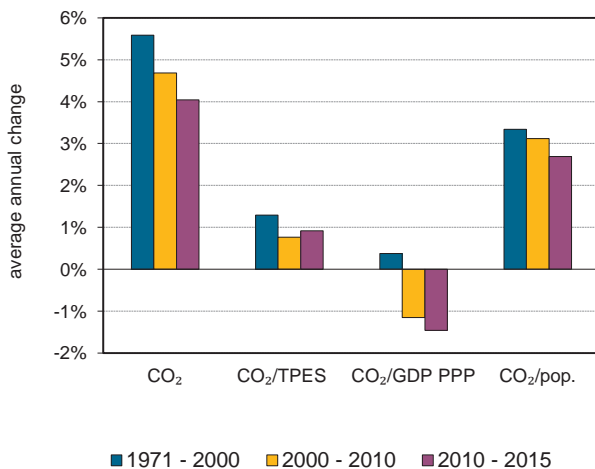
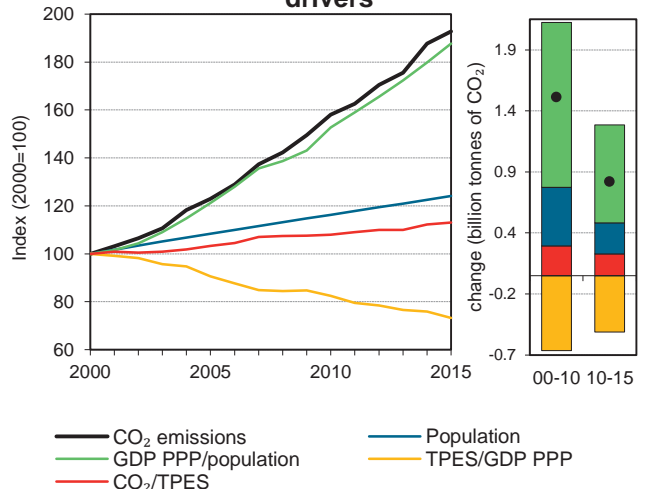


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Asia (excluding China)

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	1209.4	1 619.4	2 016.7	2 479.4	3 188.3	3 785.2	3 886.8	221%
Share of World CO ₂ from fuel combustion	6%	8%	9%	9%	10%	12%	12%	
TPES (PJ)	29176	36 301	43 424	51 711	63 607	72 588	74 071	154%
GDP (billion 2010 USD)	1603.2	2 149.2	2 609.5	3 404.7	4 575.5	5 649.0	5 948.3	271%
GDP PPP (billion 2010 USD)	4471.2	5 917.1	7 196.2	9 452.0	12 777.5	15 855.3	16 763.5	275%
Population (millions)	1625.4	1 795.0	1 964.8	2 130.0	2 284.3	2 407.6	2 438.3	50%
CO ₂ / TPES (tCO ₂ per TJ)	41.5	44.6	46.4	47.9	50.1	52.1	52.5	27%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.75	0.8	0.8	0.7	0.7	0.7	0.7	-13%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.3	0.2	0.2	0.2	-14%
CO ₂ / population (tCO ₂ per capita)	0.7	0.9	1.0	1.2	1.4	1.6	1.6	114%
Share of electricity output from fossil fuels	69%	76%	80%	81%	81%	80%	81%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	634	673	685	671	685	684	672	6%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	134	167	205	264	313	321	221%
Population index	100	110	121	131	141	148	150	50%
GDP PPP per population index	100	120	133	161	203	239	250	150%
Energy intensity index - TPES / GDP PPP	100	94	92	84	76	70	68	-32%
Carbon intensity index - CO ₂ / TPES	100	108	112	116	121	126	127	27%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	2 177.7	1 221.5	482.3	5.2	3 886.8	221%
Electricity and heat generation	1 460.2	100.0	280.3	5.2	1 845.6	361%
Other energy industry own use	13.2	53.1	58.8	-	125.1	80%
Manufacturing industries and construction	636.6	180.4	93.6	0.0	910.7	155%
Transport	0.1	687.4	18.2	-	705.7	237%
<i>of which: road</i>	-	635.3	17.4	-	652.7	262%
Other	67.6	200.6	31.4	-	299.6	73%
<i>of which: residential</i>	18.4	110.1	24.5	-	152.9	82%
<i>of which: services</i>	22.2	21.6	6.2	-	49.9	116%
<i>Memo: international marine bunkers</i>	-	157.4	-	-	157.4	241%
<i>Memo: international aviation bunkers</i>	-	79.5	-	-	79.5	249%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	1262.7	405.6	15.4	15.4
Manufacturing industries - coal	636.6	156.6	7.8	23.1
Road - oil	635.3	252.2	7.7	30.9
Main activity prod. elec. and heat - gas	244.6	603.0	3.0	33.9
Unallocated autoproducers - coal	197.5	+	2.4	36.3
Manufacturing industries - oil	180.4	89.0	2.2	38.5
Residential - oil	110.1	67.0	1.3	39.8
Manufacturing industries - gas	93.6	565.9	1.1	40.9
Non-specified other - oil	90.5	121.7	1.1	42.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>3886.8</i>	<i>221.4</i>	<i>47.3</i>	<i>47.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

China (incl. Hong Kong, China)

Figure 1. CO₂ emissions by fuel

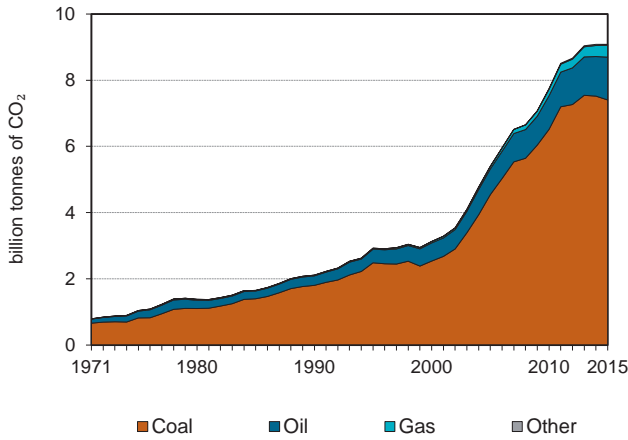


Figure 2. CO₂ emissions by sector

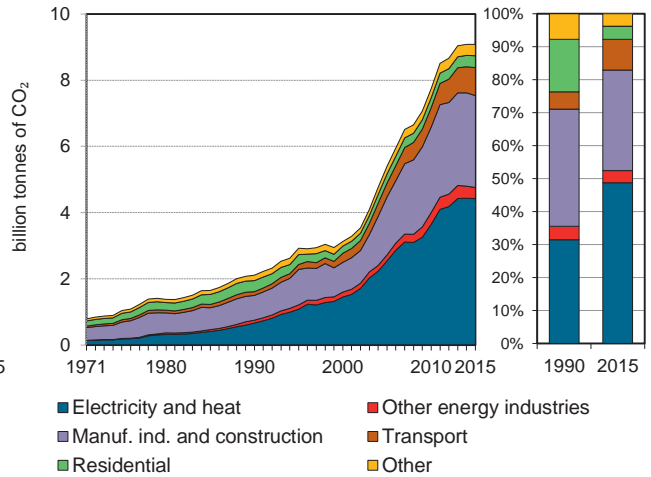


Figure 3. Electricity generation by fuel

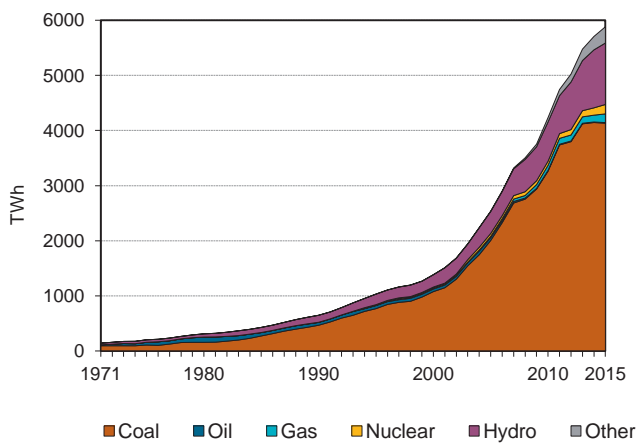


Figure 4. CO₂ from electricity generation: driving factors¹

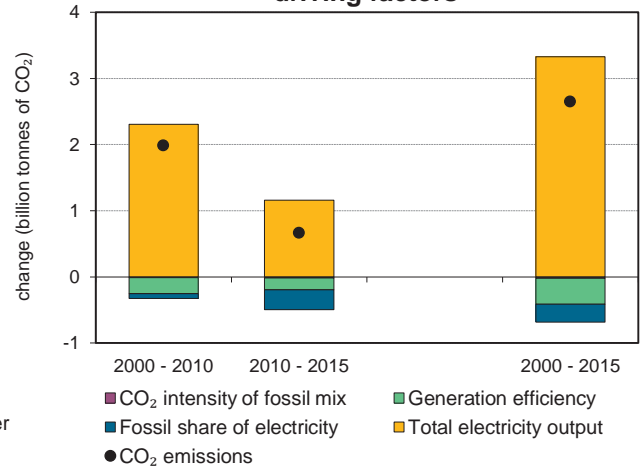


Figure 5. Changes in selected indicators

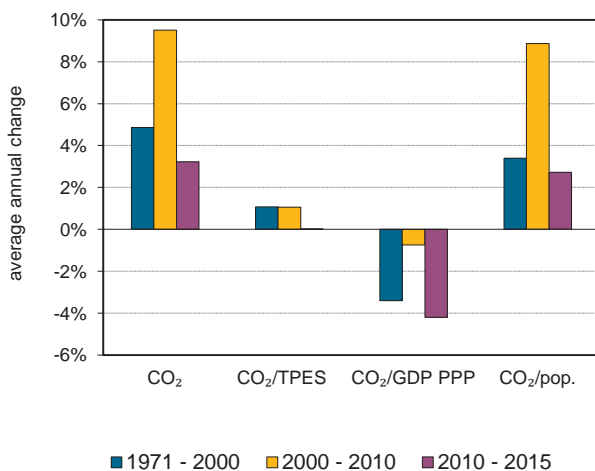
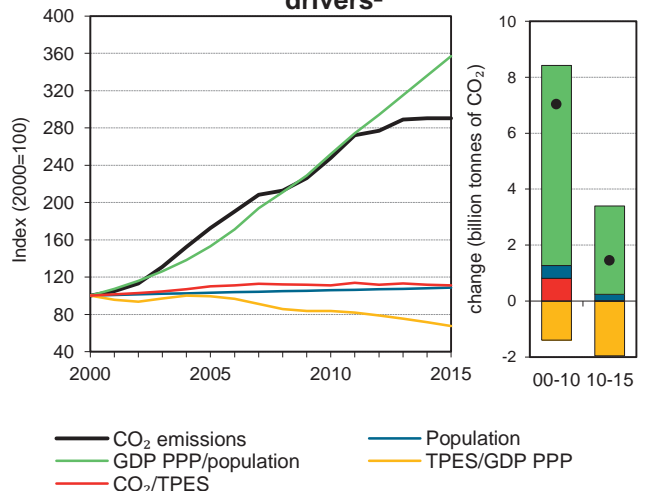


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

China (incl. Hong Kong, China)

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	2109.2	2 923.6	3 127.1	5 399.0	7 748.6	9 084.4	9 084.6	331%
Share of World CO ₂ from fuel combustion	10%	14%	14%	20%	25%	28%	28%	
TPES (PJ)	36814	44 171	47 873	75 109	106 762	124 251	125 066	240%
GDP (billion 2010 USD)	933.7	1 613.8	2 390.5	3 758.5	6 329.3	8 591.3	9 174.1	883%
GDP PPP (billion 2010 USD)	1831.3	3 191.4	4 754.0	7 505.0	12 689.8	17 255.3	18 432.3	907%
Population (millions)	1140.9	1 211.0	1 269.3	1 310.5	1 344.7	1 371.5	1 378.5	21%
CO ₂ / TPES (tCO ₂ per TJ)	57.3	66.2	65.3	71.9	72.6	73.1	72.6	27%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.26	1.8	1.3	1.4	1.2	1.1	1.0	-56%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.15	0.9	0.7	0.7	0.6	0.5	0.5	-57%
CO ₂ / population (tCO ₂ per capita)	1.9	2.4	2.5	4.1	5.8	6.6	6.6	256%
Share of electricity output from fossil fuels	81%	80%	83%	82%	80%	75%	73%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	909	915	889	875	758	683	657	-28%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	139	148	256	367	431	431	331%
Population index	100	106	111	115	118	120	121	21%
GDP PPP per population index	100	164	233	357	588	784	833	733%
Energy intensity index - TPES / GDP PPP	100	69	50	50	42	36	34	-66%
Carbon intensity index - CO ₂ / TPES	100	116	114	125	127	128	127	27%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	7 405.0	1 295.2	355.7	28.8	9 084.6	331%
Electricity and heat generation	4 290.9	24.3	79.3	28.8	4 423.3	567%
Other energy industry own use	191.0	95.3	50.8	-	337.1	291%
Manufacturing industries and construction	2 505.0	180.4	90.5	-	2 776.0	271%
Transport	9.7	795.2	39.0	-	843.9	656%
<i>of which: road</i>	-	660.0	38.3	-	698.2	+
Other	408.4	199.9	96.1	-	704.4	41%
<i>of which: residential</i>	191.0	97.4	71.5	-	359.8	7%
<i>of which: services</i>	79.7	48.1	24.4	-	152.2	299%
<i>Memo: international marine bunkers</i>	-	57.3	-	-	57.3	543%
<i>Memo: international aviation bunkers</i>	-	42.5	-	-	42.5	509%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	4045.8	565.8	30.5	30.5
Manufacturing industries - coal	2505.0	270.5	18.9	49.5
Road - oil	660.0	945.7	5.0	54.4
Unallocated autoproducers - coal	245.1	+	1.9	56.3
Non-specified other sectors - coal	217.4	109.2	1.6	57.9
Other energy industry - coal	191.0	268.8	1.4	59.4
Residential - coal	191.0	-40.8	1.4	60.8
Manufacturing industries - oil	180.4	172.3	1.4	62.2
Other transport - oil	135.3	+	1.0	63.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>9084.6</i>	<i>330.7</i>	<i>68.6</i>	<i>68.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-OECD Americas

Figure 1. CO₂ emissions by fuel

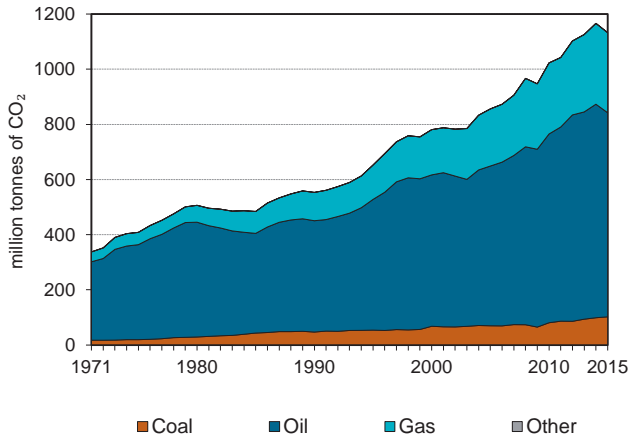


Figure 2. CO₂ emissions by sector

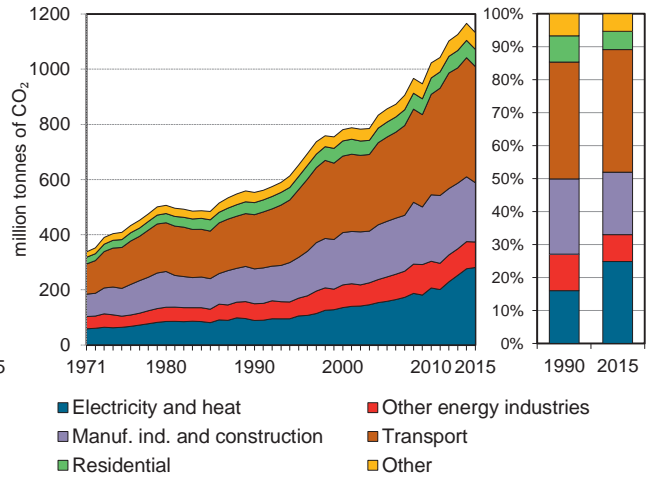


Figure 3. Electricity generation by fuel

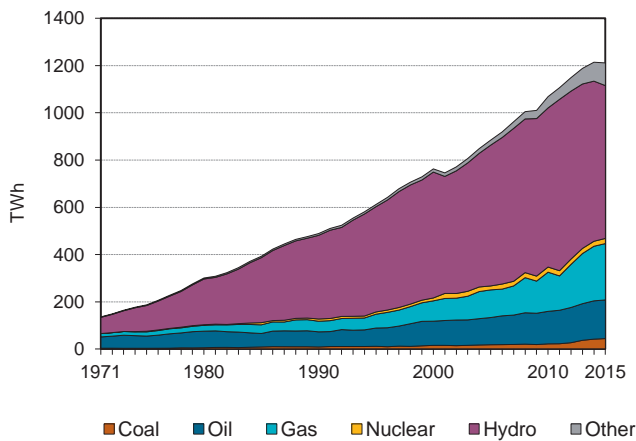


Figure 4. CO₂ from electricity generation: driving factors¹

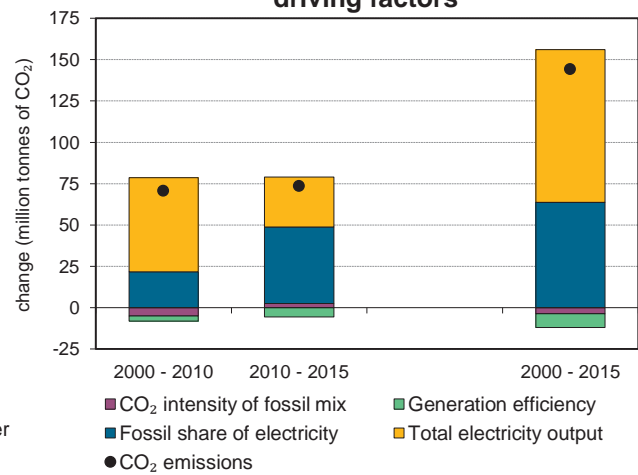


Figure 5. Changes in selected indicators

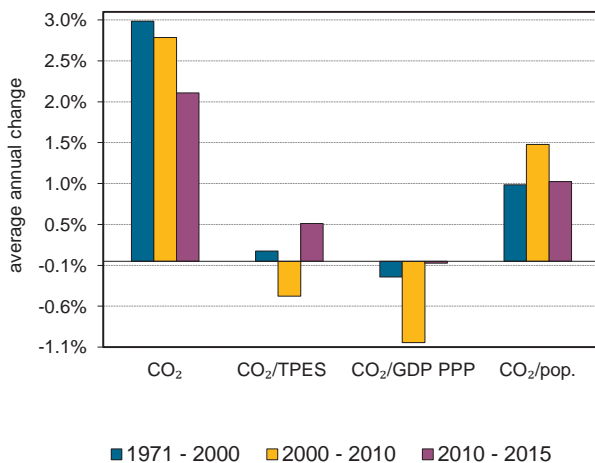
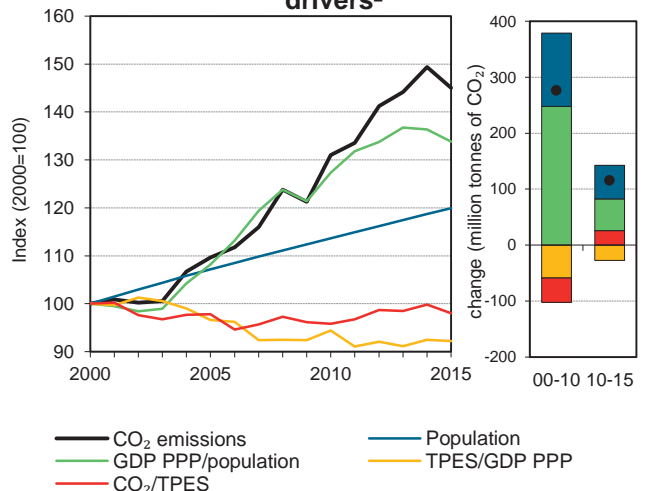


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Non-OECD Americas

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	553.2	652.4	780.8	856.0	1 022.8	1 166.2	1 132.5	105%
Share of World CO ₂ from fuel combustion	3%	3%	3%	3%	3%	4%	4%	
TPES (PJ)	13684	15 503	17 765	19 911	24 287	26 591	26 280	92%
GDP (billion 2010 USD)	2096.9	2 487.0	2 762.7	3 190.6	3 971.4	4 410.9	4 342.5	107%
GDP PPP (billion 2010 USD)	3012.1	3 552.0	3 964.7	4 597.6	5 739.9	6 416.6	6 362.4	111%
Population (millions)	344.2	374.6	404.7	433.8	460.0	480.3	485.2	41%
CO ₂ / TPES (tCO ₂ per TJ)	40.4	42.1	44.0	43.0	42.1	43.9	43.1	7%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.26	0.3	0.3	0.3	0.3	0.3	0.3	-1%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.2	0.2	0.2	0.2	-3%
CO ₂ / population (tCO ₂ per capita)	1.6	1.7	1.9	2.0	2.2	2.4	2.3	45%
Share of electricity output from fossil fuels	24%	24%	27%	28%	31%	36%	37%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	182	172	178	179	193	228	232	28%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	118	141	155	185	211	205	105%
Population index	100	109	118	126	134	140	141	41%
GDP PPP per population index	100	108	112	121	143	153	150	50%
Energy intensity index - TPES / GDP PPP	100	96	99	95	93	91	91	-9%
Carbon intensity index - CO ₂ / TPES	100	104	109	106	104	108	107	7%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	102.1	740.2	290.2	-	1 132.5	105%
Electricity and heat generation	53.7	110.2	117.1	-	281.0	217%
Other energy industry own use	2.4	35.3	54.8	-	92.6	52%
Manufacturing industries and construction	45.2	99.8	69.9	-	214.9	70%
Transport	0.0	403.5	17.7	-	421.2	114%
<i>of which: road</i>	-	378.3	13.5	-	391.8	120%
Other	0.8	91.4	30.6	-	122.9	52%
<i>of which: residential</i>	0.3	36.3	25.9	-	62.4	43%
<i>of which: services</i>	0.0	8.1	4.7	-	12.8	19%
<i>Memo: international marine bunkers</i>	-	45.1	-	-	45.1	127%
<i>Memo: international aviation bunkers</i>	-	27.4	-	-	27.4	213%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	378.3	112.8	11.8	11.8
Main activity prod. elec. and heat - gas	102.6	325.2	3.2	15.0
Manufacturing industries - oil	99.8	45.3	3.1	18.2
Main activity prod. elec. and heat - oil	97.5	169.9	3.0	21.2
Manufacturing industries - gas	69.9	122.7	2.2	23.4
Non-specified other - oil	55.2	69.2	1.7	25.1
Other energy industry own use - gas	54.8	98.9	1.7	26.8
Manufacturing industries - coal	45.2	71.5	1.4	28.2
Residential - oil	36.3	7.8	1.1	29.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>1132.5</i>	<i>104.7</i>	<i>35.4</i>	<i>35.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Middle East

Figure 1. CO₂ emissions by fuel

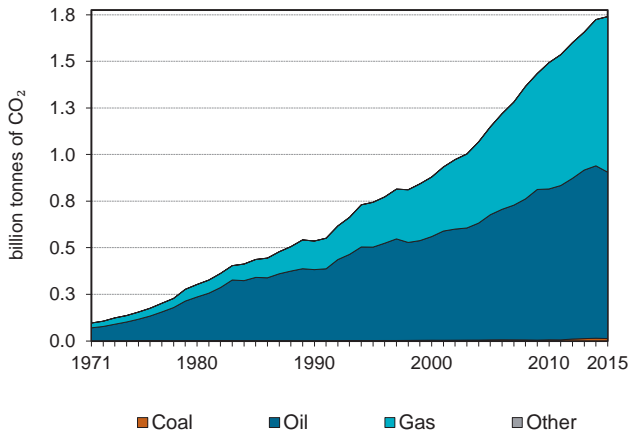


Figure 2. CO₂ emissions by sector

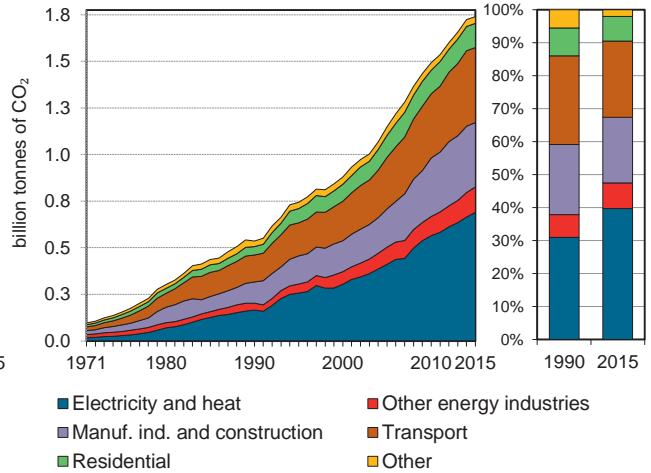


Figure 3. Electricity generation by fuel

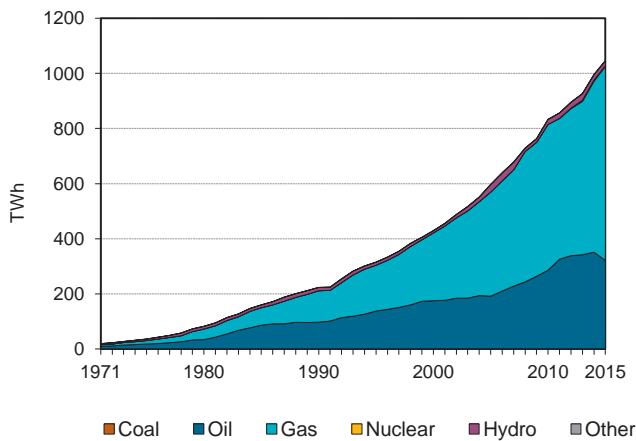


Figure 4. CO₂ from electricity generation: driving factors¹

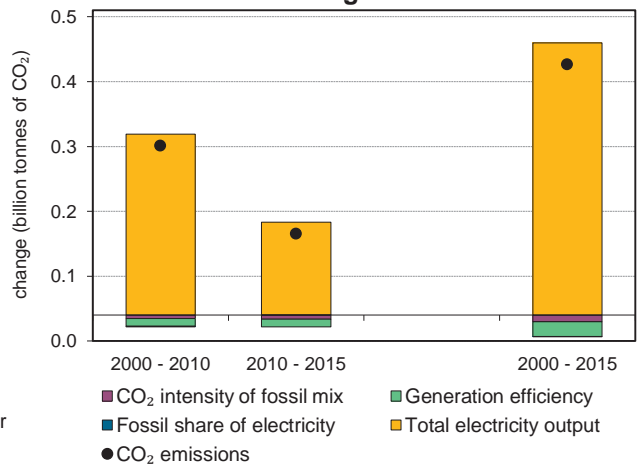


Figure 5. Changes in selected indicators

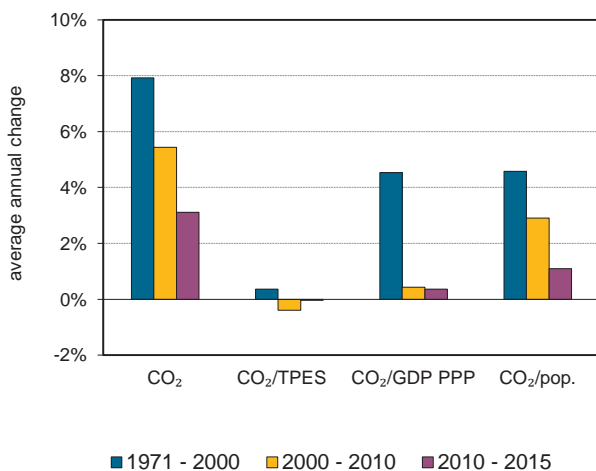
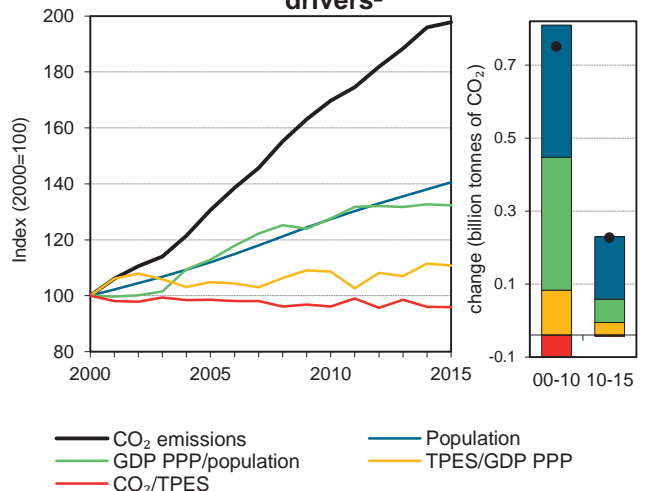


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

Middle East

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	535.9	743.8	879.4	1 148.2	1 492.8	1 723.8	1 739.7	225%
Share of World CO ₂ from fuel combustion	3%	3%	4%	4%	5%	5%	5%	
TPES (PJ)	8838	12 840	14 801	19 616	26 135	30 220	30 515	245%
GDP (billion 2010 USD)	797.5	936.8	1 161.8	1 477.9	1 899.3	2 160.3	2 201.0	176%
GDP PPP (billion 2010 USD)	1852	2 145.2	2 669.4	3 374.8	4 339.8	4 891.0	4 967.1	168%
Population (millions)	127.1	143.6	161.4	180.8	205.7	222.9	227.0	79%
CO ₂ / TPES (tCO ₂ per TJ)	60.6	57.9	59.4	58.5	57.1	57.0	57.0	-6%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.67	0.8	0.8	0.8	0.8	0.8	0.8	18%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.29	0.3	0.3	0.3	0.3	0.4	0.4	21%
CO ₂ / population (tCO ₂ per capita)	4.2	5.2	5.4	6.4	7.3	7.7	7.7	82%
Share of electricity output from fossil fuels	95%	96%	98%	95%	98%	98%	98%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	742	814	708	688	678	668	659	-11%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	139	164	214	279	322	325	225%
Population index	100	113	127	142	162	175	179	79%
GDP PPP per population index	100	103	114	128	145	151	150	50%
Energy intensity index - TPES / GDP PPP	100	125	116	122	126	129	129	29%
Carbon intensity index - CO ₂ / TPES	100	96	98	97	94	94	94	-6%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	12.6	893.0	834.1	-	1 739.7	225%
Electricity and heat generation	1.7	297.2	391.2	-	690.2	316%
Other energy industry own use	1.3	47.2	87.8	-	136.3	269%
Manufacturing industries and construction	9.6	106.2	229.4	-	345.3	203%
Transport	-	386.5	15.7	-	402.1	178%
<i>of which: road</i>	-	368.1	14.7	-	382.9	168%
Other	0.0	55.8	109.9	-	165.8	122%
<i>of which: residential</i>	0.0	37.4	92.5	-	129.9	189%
<i>of which: services</i>	-	5.3	13.8	-	19.1	85%
<i>Memo: international marine bunkers</i>	-	84.4	-	-	84.4	167%
<i>Memo: international aviation bunkers</i>	-	49.9	-	-	49.9	123%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	368.1	157.9	14.1	14.1
Main activity prod. elec. and heat - gas	297.1	444.5	11.4	25.6
Main activity prod. elec. and heat - oil	272.5	232.5	10.5	36.0
Manufacturing industries - gas	229.4	335.0	8.8	44.8
Manufacturing industries - oil	106.2	75.6	4.1	48.9
Unallocated autoproducers - gas	94.1	279.6	3.6	52.5
Residential - gas	92.5	+	3.6	56.1
Other energy industry own use - gas	87.8	569.9	3.4	59.5
Other energy industry own use - oil	47.2	102.8	1.8	61.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>1739.7</i>	<i>224.6</i>	<i>66.8</i>	<i>66.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

IEA and Accession/Association countries

Figure 1. CO₂ emissions by fuel

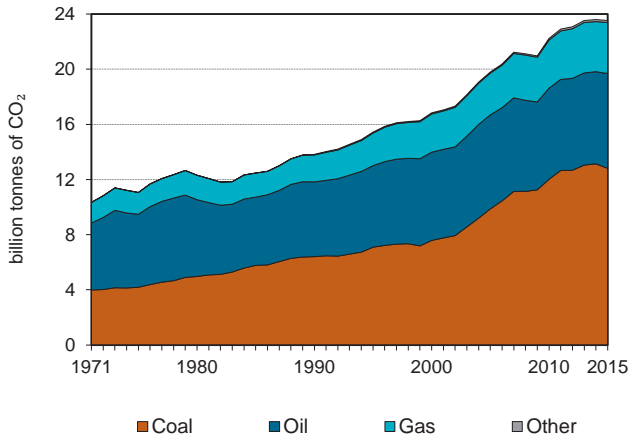


Figure 2. CO₂ emissions by sector

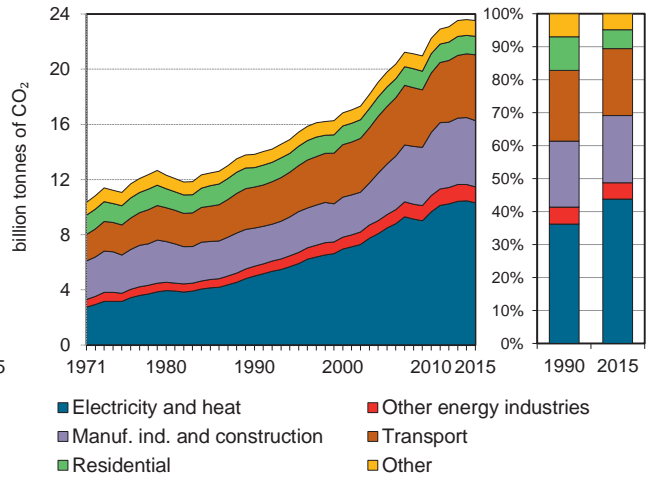


Figure 3. Electricity generation by fuel

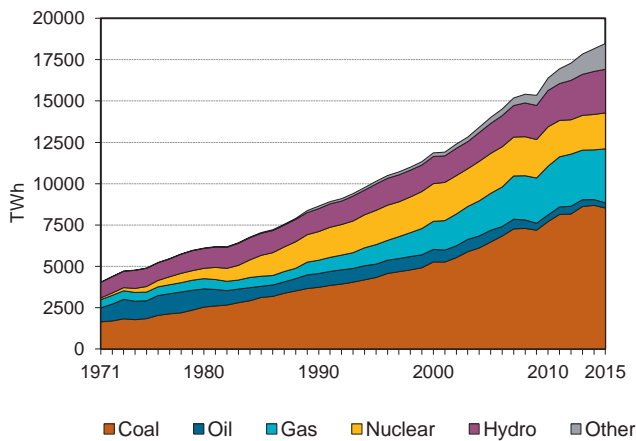


Figure 4. CO₂ from electricity generation: driving factors¹

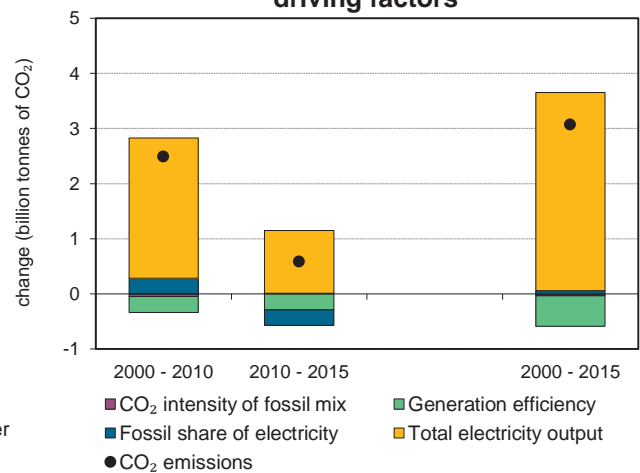


Figure 5. Changes in selected indicators

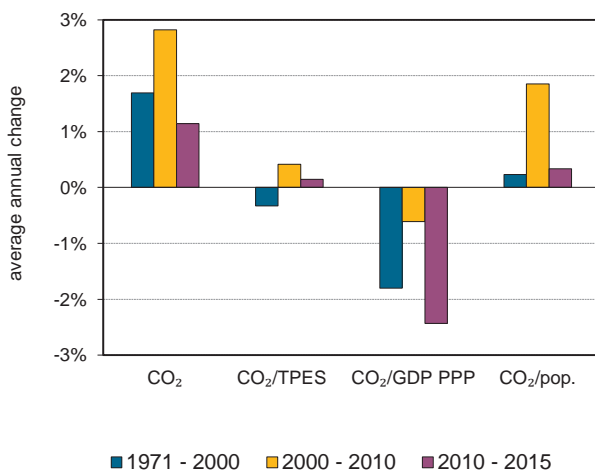
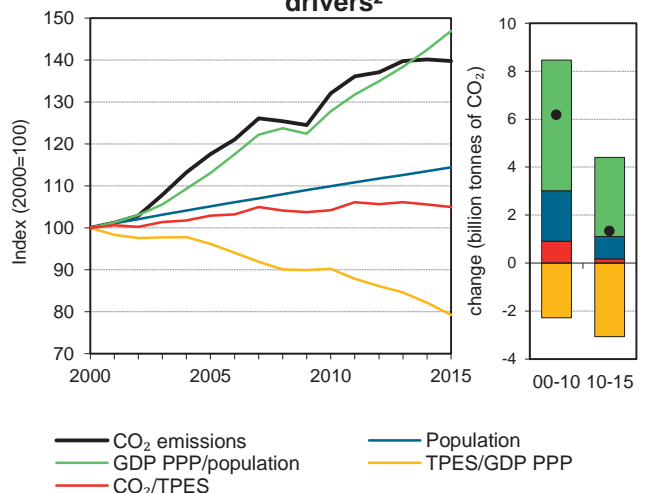


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

IEA and Accession/Association countries

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	13823.1	15 437.5	16 836.4	19 796.0	22 233.7	23 598.3	23 531.8	70%
Share of World CO ₂ from fuel combustion	67%	72%	73%	73%	73%	73%	73%	
TPES (PJ)	244678	271 818	297 112	339 577	376 550	394 382	395 654	62%
GDP (billion 2010 USD)	31073.1	35 241.4	41 954.5	48 139.6	53 601.1	59 485.5	61 367.0	97%
GDP PPP (billion 2010 USD)	32502.3	37 883.5	45 870.3	54 488.5	64 404.9	74 139.1	77 097.8	137%
Population (millions)	3335.1	3 559.4	3 768.8	3 960.3	4 142.2	4 277.6	4 311.7	29%
CO ₂ / TPES (tCO ₂ per TJ)	56.5	56.8	56.7	58.3	59.0	59.8	59.5	5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.44	0.4	0.4	0.4	0.4	0.4	0.4	-14%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.43	0.4	0.4	0.4	0.3	0.3	0.3	-28%
CO ₂ / population (tCO ₂ per capita)	4.1	4.3	4.5	5.0	5.4	5.5	5.5	32%
Share of electricity output from fossil fuels	62%	62%	65%	68%	68%	67%	66%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	547	551	554	568	549	536	517	-5%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	112	122	143	161	171	170	70%
Population index	100	107	113	119	124	128	129	29%
GDP PPP per population index	100	109	125	141	160	178	183	83%
Energy intensity index - TPES / GDP PPP	100	95	86	83	78	71	68	-32%
Carbon intensity index - CO ₂ / TPES	100	101	100	103	105	106	105	5%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	12 808.7	6 877.1	3 703.2	142.7	23 531.8	70%
Electricity and heat generation	8 544.8	260.3	1 408.4	99.5	10 313.1	106%
Other energy industry own use	310.3	447.6	398.7	0.4	1 157.0	63%
Manufacturing industries and construction	3 404.9	617.9	743.3	39.1	4 805.2	74%
Transport	9.7	4 647.0	109.4	-	4 766.1	60%
<i>of which: road</i>	-	4 134.6	58.3	-	4 192.9	68%
Other	539.0	904.3	1 043.4	3.6	2 490.4	5%
<i>of which: residential</i>	250.5	434.5	658.0	0.0	1 343.1	-5%
<i>of which: services</i>	124.2	210.0	368.9	3.6	706.7	19%
<i>Memo: international marine bunkers</i>	-	402.9	-	-	402.9	45%
<i>Memo: international aviation bunkers</i>	-	358.0	-	-	358.0	124%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	7967.0	117.4	24.0	24.0
Road - oil	4134.6	65.6	12.5	36.5
Manufacturing industries - coal	3404.9	118.0	10.3	46.8
Main activity prod. elec. and heat - gas	1239.6	254.4	3.7	50.5
Manufacturing industries - gas	743.3	37.3	2.2	52.8
Residential - gas	658.0	39.5	2.0	54.8
Manufacturing industries - oil	617.9	-5.8	1.9	56.6
Unallocated autoproducers - coal	577.8	129.7	1.7	58.4
Other transport - oil	512.5	33.8	1.5	59.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>23531.8</i>	<i>70.2</i>	<i>71.0</i>	<i>71.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

European Union - 28

Figure 1. CO₂ emissions by fuel

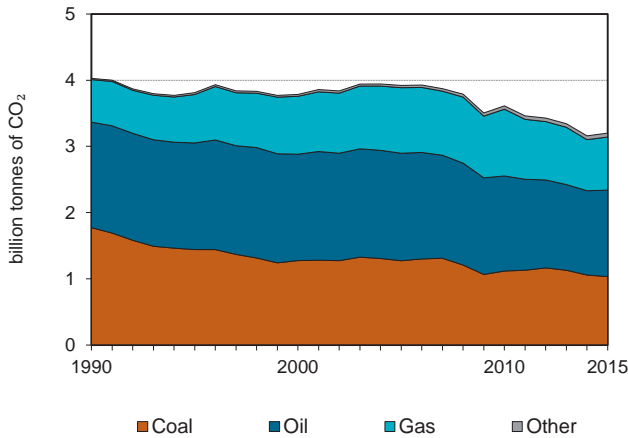


Figure 2. CO₂ emissions by sector

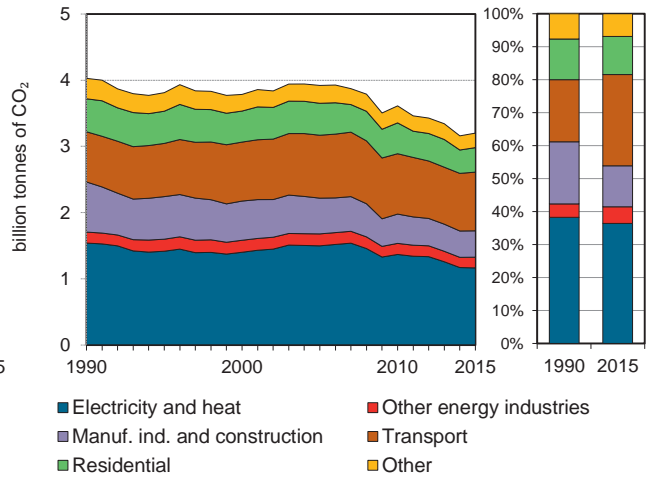


Figure 3. Electricity generation by fuel

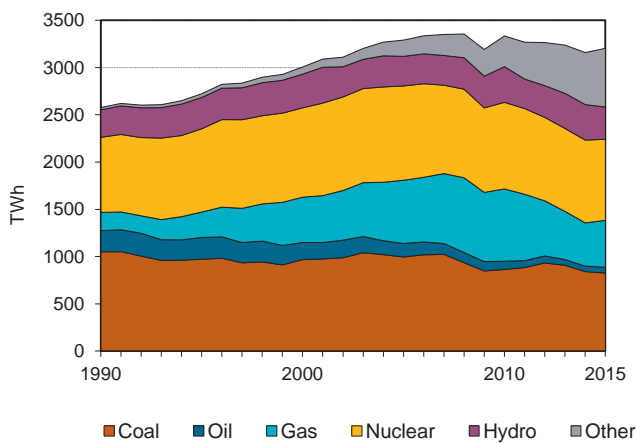


Figure 4. CO₂ from electricity generation: driving factors¹

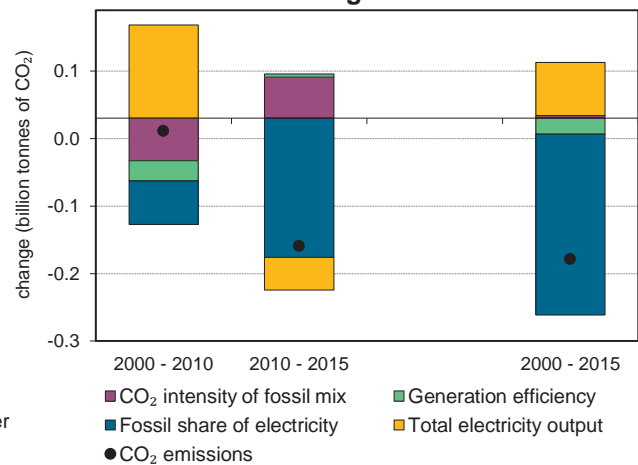


Figure 5. Changes in selected indicators

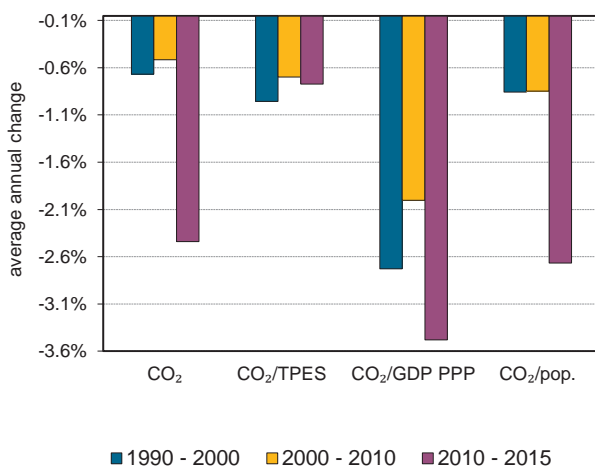
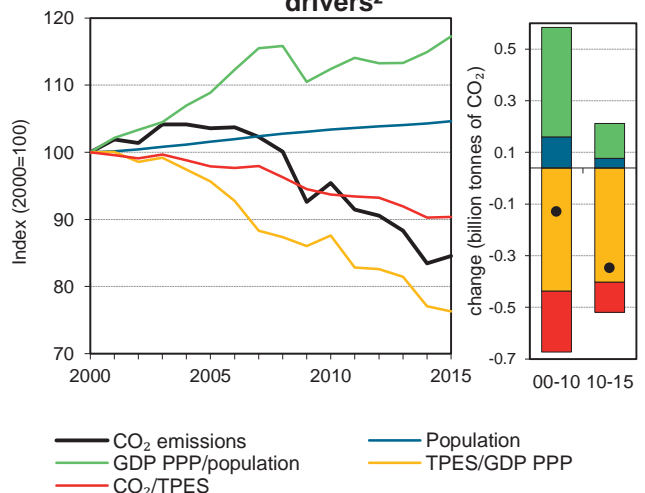


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

European Union - 28

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	4028.2	3 812.2	3 785.8	3 921.2	3 612.6	3 159.4	3 201.2	-21%
Share of World CO ₂ from fuel combustion	20%	18%	16%	15%	12%	10%	10%	
TPES (PJ)	68944	69 021	70 973	75 098	72 285	65 602	66 418	-4%
GDP (billion 2010 USD)	11879.3	12 783.3	14 769.3	16 239.4	16 977.9	17 504.6	17 889.6	51%
GDP PPP (billion 2010 USD)	11703.1	12 489.3	14 429.3	15 960.2	16 772.5	17 302.0	17 700.7	51%
Population (millions)	477.9	483.3	487.1	494.9	503.7	508.1	509.6	7%
CO ₂ / TPES (tCO ₂ per TJ)	58.4	55.2	53.3	52.2	50.0	48.2	48.2	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.2	0.2	0.2	0.2	-47%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.2	0.2	0.2	0.2	-47%
CO ₂ / population (tCO ₂ per capita)	8.4	7.9	7.8	7.9	7.2	6.2	6.3	-25%
Share of electricity output from fossil fuels	57%	54%	55%	56%	52%	44%	44%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	502	453	410	396	352	322	315	-37%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	95	94	97	90	78	79	-21%
Population index	100	101	102	104	105	106	107	7%
GDP PPP per population index	100	106	121	132	136	139	142	42%
Energy intensity index - TPES / GDP PPP	100	94	83	80	73	64	64	-36%
Carbon intensity index - CO ₂ / TPES	100	95	91	89	86	82	82	-18%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	1 033.2	1 305.7	803.0	59.4	3 201.2	-21%
Electricity and heat generation	843.4	51.6	228.8	40.7	1 164.5	-24%
Other energy industry own use	35.5	87.5	38.9	0.4	162.3	-2%
Manufacturing industries and construction	108.6	88.2	184.0	17.2	398.0	-47%
Transport	0.0	879.3	7.6	-	886.9	17%
<i>of which: road</i>	-	841.6	4.1	-	845.7	20%
Other	45.6	199.1	343.7	1.1	589.5	-27%
<i>of which: residential</i>	37.1	104.3	228.8	0.0	370.2	-26%
<i>of which: services</i>	4.3	46.2	104.6	1.1	156.2	-20%
<i>Memo: international marine bunkers</i>	-	134.8	-	-	134.8	19%
<i>Memo: international aviation bunkers</i>	-	136.1	-	-	136.1	88%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Road - oil	841.6	19.1	19.6	19.6
Main activity prod. elec. and heat - coal	787.7	-23.4	18.3	37.9
Residential - gas	228.8	27.0	5.3	43.3
Manufacturing industries - gas	184.0	-19.6	4.3	47.6
Main activity prod. elec. and heat - gas	176.0	66.7	4.1	51.6
Non-specified other - gas	114.9	34.0	2.7	54.3
Manufacturing industries - coal	108.6	-67.2	2.5	56.9
Residential - oil	104.3	-42.8	2.4	59.3
Non-specified other - oil	94.8	-39.3	2.2	61.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>3201.2</i>	<i>-20.5</i>	<i>74.5</i>	<i>74.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

G20

Figure 1. CO₂ emissions by fuel

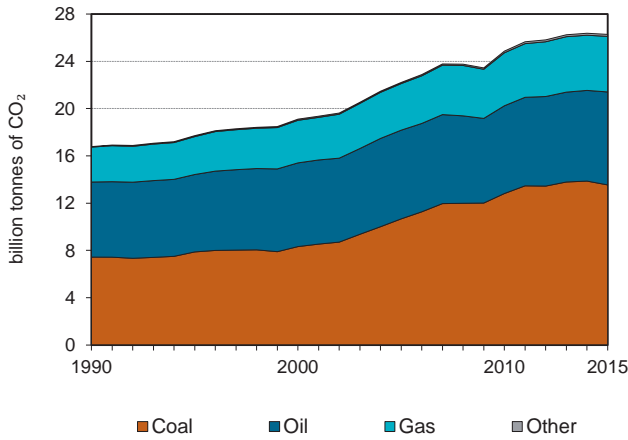


Figure 2. CO₂ emissions by sector

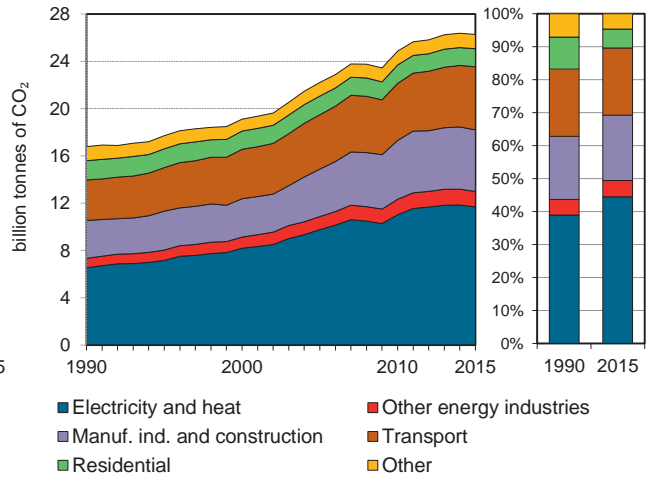


Figure 3. Electricity generation by fuel

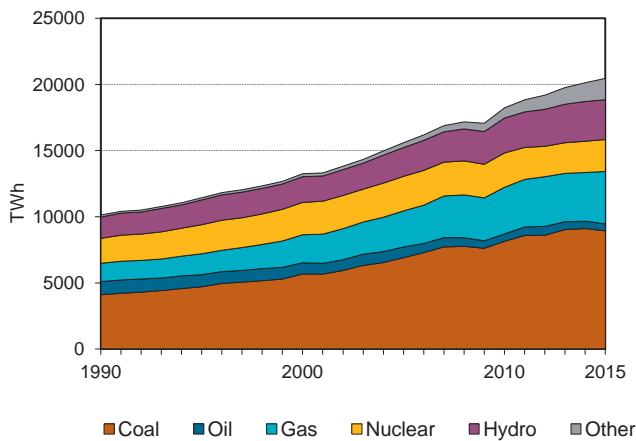


Figure 4. CO₂ from electricity generation: driving factors¹

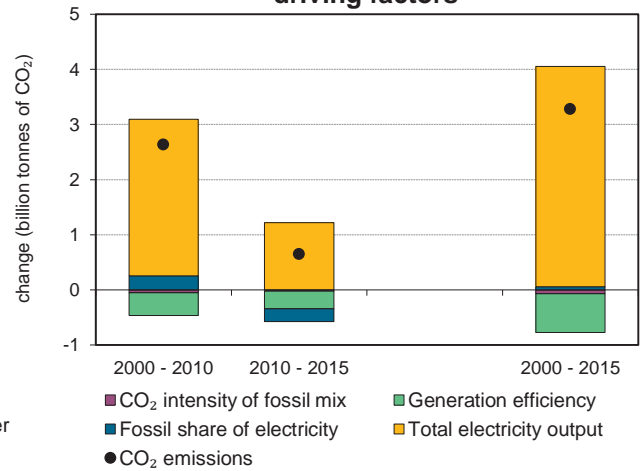


Figure 5. Changes in selected indicators

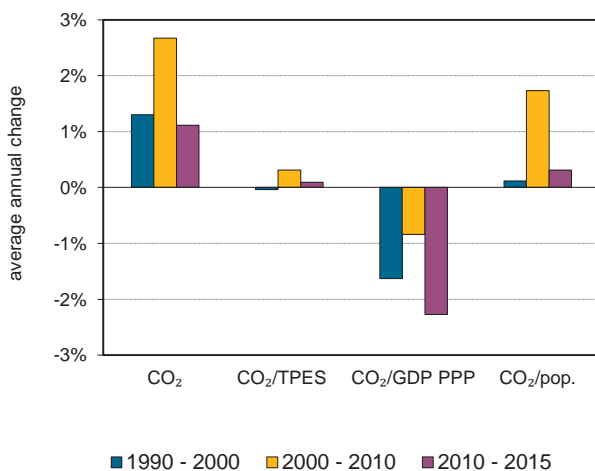
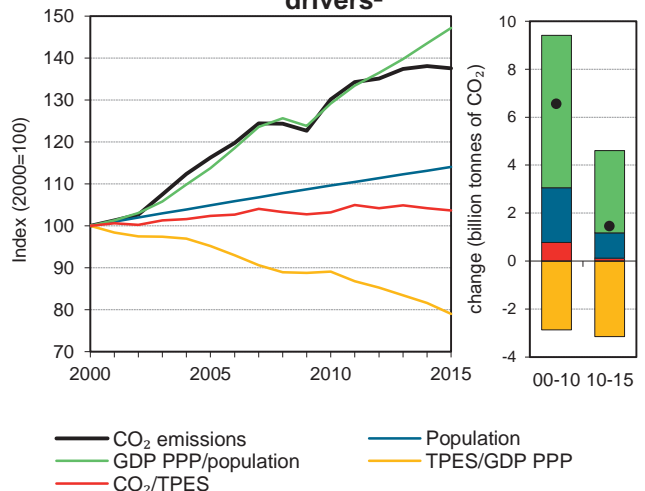


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Chapter 6.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Chapter 6.

G20

Key indicators

	1990	1995	2000	2005	2010	2014	2015	%change 90-15
CO ₂ fuel combustion (MtCO ₂)	16783.2	17 709.9	19 107.1	22 209.6	24 864.0	26 375.0	26 278.7	57%
Share of World CO ₂ from fuel combustion	82%	83%	83%	82%	82%	82%	81%	
TPES (PJ)	295813	312 797	338 007	383 779	426 303	447 734	448 399	52%
GDP (billion 2010 USD)	33738.6	37 438.5	44 328.9	51 139.5	57 368.1	63 637.4	65 374.7	94%
GDP PPP (billion 2010 USD)	37424.4	41 853.1	50 212.2	59 914.3	71 071.8	81 509.9	84 274.8	125%
Population (millions)	3659.2	3 897.4	4 118.4	4 319.7	4 513.5	4 659.6	4 696.3	28%
CO ₂ / TPES (tCO ₂ per TJ)	56.7	56.6	56.5	57.9	58.3	58.9	58.6	3%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.4	0.4	0.4	-19%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.4	0.3	0.3	0.3	-30%
CO ₂ / population (tCO ₂ per capita)	4.6	4.5	4.6	5.1	5.5	5.7	5.6	22%
Share of electricity output from fossil fuels	64%	63%	65%	67%	67%	67%	66%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	541	543	547	561	542	530	515	-5%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	114	132	148	157	157	57%
Population index	100	107	113	118	123	127	128	28%
GDP PPP per population index	100	105	119	136	154	171	175	75%
Energy intensity index - TPES / GDP PPP	100	95	85	81	76	69	67	-33%
Carbon intensity index - CO ₂ / TPES	100	100	100	102	103	104	103	3%

1. Please see the chapter *Indicator sources and methods* for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2015 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-15
CO₂ fuel combustion	13 543.3	7 866.1	4 703.0	166.3	26 278.7	57%
Electricity and heat generation	9 092.3	464.9	2 010.7	116.8	11 684.7	79%
Other energy industry own use	357.3	518.8	430.4	1.8	1 308.4	64%
Manufacturing industries and construction	3 507.5	754.9	901.5	43.3	5 207.2	62%
Transport	9.7	5 151.5	181.2	-	5 342.5	56%
<i>of which: road</i>	-	4 595.8	62.1	-	4 657.9	67%
Other	576.4	975.9	1 179.3	4.5	2 736.0	-3%
<i>of which: residential</i>	273.6	467.6	782.1	0.0	1 523.3	-7%
<i>of which: services</i>	136.6	214.7	378.0	4.2	733.4	4%
<i>Memo: international marine bunkers</i>	-	377.7	-	-	377.7	41%
<i>Memo: international aviation bunkers</i>	-	369.8	-	-	369.8	101%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2015

IPCC source category	CO ₂ emissions (MtCO ₂)	% change 90-15	Level assessment ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	8416.1	99.2	22.0	22.0
Road - oil	4595.8	64.9	12.0	34.1
Manufacturing industries - coal	3507.5	102.2	9.2	43.3
Main activity prod. elec. and heat - gas	1618.2	117.2	4.2	47.5
Manufacturing industries - gas	901.5	31.9	2.4	49.9
Residential - gas	782.1	31.2	2.0	51.9
Manufacturing industries - oil	754.9	-3.6	2.0	53.9
Unallocated autoproducers - coal	676.2	86.6	1.8	55.7
Other transport - oil	555.7	20.1	1.5	57.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>26278.7</i>	<i>56.6</i>	<i>68.8</i>	<i>68.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

5. SUMMARY TABLES

CO₂ emissions from fuel combustionmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	13 942.2	15 484.1	17 706.3	18 246.5	20 509.0	21 365.0	23 144.3	27 045.0	30 434.4	32 324.7	32 294.2	57.5%
<i>Annex I Parties</i>	..	..	..	..	13 722.6	12 981.1	13 548.3	13 875.9	13 222.9	12 631.8	12 406.5	-9.6%
<i>Annex II Parties</i>	8 578.7	8 843.1	9 417.5	9 071.6	9 658.1	10 029.2	10 825.1	11 100.7	10 398.5	9 917.9	9 741.7	0.9%
<i>North America</i>	4 628.2	4 732.0	5 017.1	4 907.5	5 222.0	5 522.1	6 158.8	6 243.5	5 875.5	5 722.5	5 546.7	6.2%
<i>Europe</i>	3 043.0	3 065.7	3 307.0	3 059.3	3 112.7	3 087.9	3 161.3	3 273.9	2 991.7	2 606.4	2 641.3	-15.1%
<i>Asia Oceania</i>	907.5	1 045.4	1 093.4	1 104.9	1 323.4	1 419.2	1 504.9	1 583.3	1 531.3	1 588.9	1 553.7	17.4%
<i>Annex I EIT</i>	..	..	..	..	3 930.8	2 792.3	2 513.3	2 548.8	2 548.7	2 399.2	2 340.1	-40.5%
<i>Non-Annex I Parties</i>	..	..	..	..	6 155.8	7 665.0	8 741.9	12 174.4	16 090.9	18 560.7	18 700.9	203.8%
<i>Annex B Kyoto Parties</i>	..	..	..	..	5 383.4	4 795.5	4 655.6	4 879.7	4 631.6	4 130.0	4 126.0	-23.4%
Intl. aviation bunkers	169.2	173.9	202.1	224.9	258.9	290.3	355.8	422.8	457.7	504.5	529.7	104.6%
Intl. marine bunkers	353.8	341.1	357.3	306.8	371.6	428.5	498.4	571.9	662.9	627.7	657.0	76.8%
Non-OECD Total	4 077.2	5 213.4	6 564.8	7 375.1	8 858.0	9 141.4	9 832.3	13 203.3	16 977.3	19 344.2	19 387.3	118.9%
OECD Total	9 342.0	9 755.8	10 582.0	10 339.8	11 020.3	11 504.8	12 457.9	12 847.0	12 336.4	11 848.2	11 720.2	6.4%
Canada	340.1	377.0	422.2	393.8	419.5	448.9	516.2	541.2	528.4	554.4	549.2	30.9%
Chile	21.0	17.1	21.4	19.6	29.4	37.1	48.6	54.4	68.6	75.8	81.6	177.5%
Mexico	93.7	134.5	204.5	241.1	256.9	291.2	359.6	412.3	440.3	434.1	442.3	72.2%
United States	4 288.1	4 355.0	4 594.9	4 513.7	4 802.5	5 073.2	5 642.6	5 702.3	5 347.0	5 168.1	4 997.5	4.1%
OECD Americas	4 743.0	4 883.6	5 243.0	5 168.2	5 508.3	5 850.4	6 567.0	6 710.2	6 384.4	6 232.4	6 070.7	10.2%
Australia	143.4	179.5	206.7	220.2	259.7	285.4	334.7	371.9	389.1	373.3	380.9	46.7%
Israel ²	13.8	16.4	18.8	24.3	32.8	44.9	54.8	58.8	68.4	61.3	62.3	89.8%
Japan	750.7	849.5	870.2	865.9	1 042.0	1 110.0	1 141.2	1 177.7	1 111.8	1 184.4	1 141.6	9.6%
Korea	52.9	77.7	125.6	155.7	231.7	357.1	431.7	457.5	550.7	567.8	586.0	152.9%
New Zealand	13.5	16.4	16.5	18.9	21.7	23.9	29.0	33.7	30.3	31.2	31.2	43.3%
OECD Asia Oceania	974.2	1 139.6	1 237.9	1 284.9	1 588.0	1 821.2	1 991.5	2 099.6	2 150.4	2 218.0	2 201.9	38.7%
Austria	48.6	49.5	54.3	52.6	56.3	59.6	61.9	74.1	68.7	60.6	62.1	10.4%
Belgium	117.9	115.5	125.5	101.0	106.2	111.4	113.7	107.3	103.6	87.3	92.5	-13.0%
Czech Republic	153.6	155.1	168.1	175.4	150.3	123.3	121.3	118.5	112.6	98.4	99.6	-33.8%
Denmark	55.4	52.6	63.0	61.0	51.0	58.4	50.8	48.4	47.2	34.4	32.0	-37.3%
Estonia	..	..	..	..	36.0	16.0	14.5	16.8	18.7	18.6	15.5	-56.8%
Finland	39.8	44.2	54.8	48.3	53.8	55.7	54.6	54.9	62.0	45.5	42.1	-21.8%
France	423.2	422.9	455.1	351.7	345.5	343.5	364.5	371.8	340.8	284.0	290.5	-15.9%
Germany	978.2	973.4	1 048.4	1 004.6	940.3	856.7	812.4	786.8	758.9	723.3	729.8	-22.4%
Greece	25.1	34.1	45.2	54.5	69.9	76.5	88.0	95.2	83.4	65.8	64.6	-7.6%
Hungary	60.3	70.2	82.6	79.8	65.7	56.3	53.3	54.7	47.1	40.0	42.5	-35.3%
Iceland	1.4	1.6	1.7	1.6	1.9	2.0	2.2	2.2	1.9	2.0	2.1	8.4%
Ireland	21.6	21.1	25.9	26.4	30.1	32.6	40.8	44.2	39.3	33.9	35.3	17.3%
Italy	289.3	316.9	355.2	341.9	389.3	401.0	420.3	456.3	391.9	319.7	330.7	-15.0%
Latvia	..	..	..	..	18.8	8.9	6.8	7.6	8.1	6.7	6.8	-63.5%
Luxembourg	16.5	12.7	12.4	10.3	10.7	8.2	8.1	11.5	10.6	9.3	8.8	-18.0%
Netherlands	127.6	131.9	145.4	138.3	147.7	163.5	161.5	167.0	170.0	148.5	156.0	5.6%
Norway	23.0	23.6	27.2	26.4	27.5	31.4	31.9	34.5	37.5	35.4	36.7	33.7%
Poland	287.4	338.9	416.0	422.4	344.8	333.4	289.7	296.5	307.6	279.1	282.4	-18.1%
Portugal	14.4	18.0	23.7	23.9	37.9	47.2	57.8	61.4	47.5	42.8	47.0	24.2%
Slovak Republic	38.9	43.2	55.8	54.4	54.8	41.2	36.9	37.3	34.6	29.2	29.4	-46.3%
Slovenia	..	..	..	..	13.5	14.1	14.1	15.4	15.5	12.8	12.8	-5.2%
Spain	119.0	155.8	186.2	173.0	202.6	228.2	278.5	333.6	262.0	232.0	247.0	21.9%
Sweden	82.0	79.0	73.1	58.4	52.1	56.9	52.0	49.1	46.0	37.3	37.1	-28.8%
Switzerland	38.9	36.7	39.2	41.8	40.7	41.4	42.0	44.0	43.2	37.9	37.3	-8.4%
Turkey	41.7	59.6	71.5	95.4	127.5	152.2	201.5	216.5	265.8	306.6	317.2	148.9%
United Kingdom	621.0	575.9	570.5	543.4	549.3	513.7	520.4	531.5	477.0	406.8	389.8	-29.0%
OECD Europe ²	3 624.8	3 732.6	4 101.1	3 886.7	3 924.1	3 833.2	3 899.4	4 037.2	3 801.6	3 397.8	3 447.6	-12.1%
<i>IEA/Accession/Association</i>	10 342.1	11 061.3	12 314.9	12 474.2	13 823.1	15 437.5	16 836.4	19 796.0	22 233.7	23 598.3	23 531.8	70.2%
<i>European Union - 28</i>	..	..	..	..	4 028.2	3 812.2	3 785.8	3 921.2	3 612.6	3 159.4	3 201.2	-20.5%
<i>G20</i>	..	..	..	..	16 783.2	17 709.9	19 107.1	22 209.6	24 864.0	26 375.0	26 278.7	56.6%
<i>Africa</i>	249.0	323.9	397.6	465.6	529.0	576.2	658.1	857.3	996.1	1 121.8	1 140.4	115.6%
<i>Americas</i>	5 080.4	5 292.0	5 749.4	5 652.3	6 061.5	6 502.8	7 347.8	7 566.2	7 407.2	7 398.7	7 203.2	18.8%
<i>Asia</i>	..	..	..	..	5 824.2	7 299.0	8 156.1	11 290.2	14 839.5	17 157.6	17 258.6	196.3%
<i>Europe</i>	..	..	..	..	7 176.7	5 952.8	5 757.1	5 920.4	5 641.3	5 096.7	5 080.0	-29.2%
<i>Oceania</i>	161.1	201.1	228.4	244.6	287.0	315.3	371.0	416.2	429.7	417.7	425.4	48.2%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustionmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	4 077.2	5 213.4	6 564.8	7 375.1	8 858.0	9 141.4	9 832.3	13 203.3	16 977.3	19 344.2	19 387.3	118.9%
Albania	3.9	4.3	6.8	6.9	5.7	1.8	3.1	3.8	3.9	4.1	3.8	-32.6%
Armenia	..	..	..	..	19.8	3.4	3.4	4.1	4.0	5.2	4.7	-76.3%
Azerbaijan	..	..	..	..	53.5	32.4	27.3	29.0	23.5	30.8	30.8	-42.4%
Belarus	..	..	..	..	99.8	56.9	52.1	55.0	59.9	57.4	53.2	-46.7%
Bosnia and Herzegovina	..	..	..	..	24.0	3.3	13.7	15.9	20.5	21.6	22.2	-7.3%
Bulgaria	63.8	73.3	85.0	82.2	74.6	52.7	42.2	46.5	44.4	41.6	43.8	-41.3%
Croatia	..	..	..	..	20.3	14.8	16.8	19.9	18.2	15.1	15.5	-23.7%
Cyprus ¹	1.7	1.7	2.6	2.8	3.9	5.0	6.3	7.0	7.3	5.8	5.9	51.6%
FYR of Macedonia	..	..	..	..	8.6	8.3	8.5	8.9	8.3	7.4	7.2	-15.8%
Georgia	..	..	..	..	33.5	8.1	4.6	4.1	5.0	7.7	8.4	-75.0%
Gibraltar	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.5	0.6	302.1%
Kazakhstan	..	..	..	..	237.2	170.5	112.0	156.9	221.1	229.8	225.1	-5.1%
Kosovo	..	..	..	..	..	..	5.1	6.6	8.7	7.4	8.6	..
Kyrgyzstan	..	..	..	..	22.8	4.5	4.5	4.9	6.0	9.0	9.9	-56.6%
Lithuania	..	..	..	..	32.2	13.4	10.2	12.4	12.3	10.5	10.5	-67.3%
Malta	0.7	0.7	1.0	1.2	2.3	2.4	2.1	2.7	2.6	2.4	1.6	-28.9%
Republic of Moldova	..	..	..	..	30.5	11.9	6.5	7.7	7.9	7.2	7.6	-75.2%
Montenegro	..	..	..	..	..	..	..	2.0	2.6	2.2	2.4	..
Romania	114.6	140.6	177.3	174.9	168.3	117.6	86.2	92.7	74.8	68.2	69.5	-58.7%
Russian Federation	..	..	..	..	2 163.2	1 548.0	1 474.2	1 481.7	1 528.9	1 486.9	1 469.0	-32.1%
Serbia	..	..	..	..	62.0	44.6	43.0	49.6	45.9	38.1	44.5	-28.2%
Tajikistan	..	..	..	..	11.0	2.5	2.2	2.3	2.3	4.1	4.3	-60.8%
Turkmenistan	..	..	..	..	44.6	33.2	36.7	48.1	56.9	67.0	69.1	54.8%
Ukraine	..	..	..	..	688.4	395.7	295.0	293.9	266.2	234.7	189.4	-72.5%
Uzbekistan	..	..	..	..	114.9	94.5	114.0	107.1	97.1	97.9	95.6	-16.8%
Former Soviet Union ¹	1 941.6	2 480.6	2 935.6	3 078.1	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	61.8	73.5	84.2	119.7	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	2 188.3	2 774.7	3 292.7	3 465.8	3 921.3	2 625.9	2 370.1	2 463.4	2 528.7	2 462.8	2 403.4	-38.7%
Algeria	8.6	13.5	27.7	42.1	51.2	55.3	61.5	77.4	95.5	123.1	130.4	154.8%
Angola	1.6	2.0	2.7	2.8	3.9	3.9	4.6	6.1	15.1	19.3	20.4	420.7%
Benin	0.3	0.5	0.4	0.5	0.3	0.2	1.4	2.7	4.6	4.8	5.3	+
Botswana	..	..	..	1.5	2.8	3.2	4.0	4.3	3.3	7.0	7.1	151.2%
Cameroon	0.7	1.0	1.7	2.4	2.6	2.5	2.8	2.9	5.0	5.6	6.0	127.6%
Congo	0.6	0.6	0.7	0.8	0.6	0.5	0.5	0.8	1.8	2.6	2.7	323.1%
Côte d'Ivoire	2.4	3.0	3.4	3.0	2.7	3.3	6.3	5.8	6.2	8.9	9.7	257.1%
Dem. Rep. of the Congo	2.6	2.6	3.2	3.3	3.0	1.1	0.9	1.3	1.9	4.7	2.7	-8.5%
Egypt	20.0	25.6	40.7	64.4	77.8	81.6	99.7	144.6	176.4	193.3	198.6	155.2%
Eritrea	..	..	..	..	..	0.8	0.6	0.6	0.5	0.6	0.6	..
Ethiopia	1.3	1.2	1.4	1.4	2.2	2.3	3.2	4.5	6.0	10.1	10.2	369.9%
Gabon	0.5	0.8	1.3	1.7	0.9	1.3	1.5	1.7	2.6	3.3	3.2	256.7%
Ghana	1.9	2.3	2.2	2.1	2.5	3.2	5.0	6.4	10.4	13.2	14.0	453.4%
Kenya	3.2	3.5	4.4	4.6	5.5	5.7	7.8	7.5	11.2	12.4	14.1	156.4%
Libya	3.7	8.7	17.6	21.2	25.8	32.9	36.8	43.0	48.1	47.9	45.3	75.4%
Mauritius	0.3	0.4	0.6	0.6	1.2	1.6	2.4	3.0	3.7	4.0	4.0	240.9%
Morocco	6.6	9.7	13.7	16.3	19.6	26.1	29.5	39.2	46.4	53.5	54.9	179.6%
Mozambique	2.9	2.4	2.3	1.5	1.1	1.1	1.3	1.5	2.4	3.9	5.0	365.4%
Namibia	..	..	..	..	..	1.8	1.9	2.5	3.1	3.6	3.8	..
Niger	..	..	..	..	..	..	0.6	0.7	1.4	2.0	2.0	..
Nigeria	5.7	10.8	25.3	31.8	28.1	32.8	43.8	56.4	55.8	60.1	64.4	129.7%
Senegal	1.2	1.6	2.0	2.1	2.1	2.5	3.5	4.6	5.5	6.3	6.6	211.8%
South Africa	157.1	203.0	208.4	222.9	243.8	259.8	280.5	372.3	406.7	434.6	427.6	75.4%
South Sudan	..	..	..	..	..	..	..	..	..	1.5	1.1	..
Sudan	3.2	3.2	3.7	4.0	5.3	4.3	5.5	9.9	15.0	13.4	15.4	190.8%
United Rep. of Tanzania	1.4	1.4	1.5	1.5	1.7	2.5	2.6	5.1	6.1	10.4	11.6	595.6%
Togo	0.3	0.3	0.4	0.3	0.6	0.6	0.9	1.0	2.1	1.8	1.9	225.4%
Tunisia	3.7	4.8	7.9	9.7	12.2	14.0	17.6	19.5	23.3	25.0	25.6	110.1%
Zambia	3.4	4.3	3.3	2.7	2.6	2.0	1.7	2.1	1.6	3.2	3.3	28.9%
Zimbabwe	7.2	7.2	8.0	9.7	16.2	15.1	13.3	10.3	9.2	11.5	11.8	-27.5%
Other Africa	8.4	9.6	13.3	10.9	12.6	14.2	16.4	19.6	25.3	30.3	30.9	145.0%
Africa	249.0	323.9	397.6	465.6	529.0	576.2	658.1	857.3	996.1	1 121.8	1 140.4	115.6%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustionmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	2.9	4.4	6.6	7.7	11.4	16.5	20.9	32.0	49.9	62.9	70.5	517.1%
Brunei Darussalam	0.4	1.4	2.6	2.9	3.3	4.5	4.4	4.8	6.9	6.7	6.0	83.3%
Cambodia	..	..	..	..	..	1.5	2.0	2.6	4.6	6.1	8.0	..
DPR of Korea	69.2	78.6	108.1	129.4	116.8	76.5	70.0	75.3	49.3	28.7	22.5	-80.7%
India	181.0	217.1	262.0	375.8	530.4	707.7	890.4	1 079.6	1 594.3	2 018.8	2 066.0	289.5%
Indonesia	25.2	37.8	67.6	83.9	133.9	204.1	255.3	318.5	376.2	434.9	441.9	230.0%
Malaysia	12.8	16.2	23.7	32.9	49.6	79.6	115.0	155.8	189.8	220.5	220.4	344.5%
Mongolia	..	..	..	11.8	12.9	10.2	9.0	11.0	14.2	17.9	17.2	33.5%
Myanmar	4.5	3.9	5.1	5.7	3.9	6.7	9.3	10.6	7.9	20.0	24.4	523.0%
Nepal	0.2	0.3	0.5	0.6	0.9	1.8	3.1	3.1	4.1	5.8	5.6	525.5%
Pakistan	15.9	20.0	24.3	36.5	56.0	79.2	94.4	115.0	129.6	141.6	146.0	161.0%
Philippines	23.0	28.9	33.3	28.5	38.0	57.2	68.1	71.5	77.1	95.7	103.9	173.1%
Singapore	6.1	8.4	12.7	16.6	29.0	37.6	42.1	37.9	44.3	45.3	44.4	53.4%
Sri Lanka	2.8	2.6	3.6	3.5	3.7	5.5	10.5	13.4	12.4	16.7	19.5	430.3%
Chinese Taipei	29.8	40.7	71.4	69.1	111.1	154.0	214.3	253.6	256.2	249.7	249.4	124.5%
Thailand	16.2	21.1	33.7	42.1	80.9	139.9	152.3	200.2	223.4	243.9	247.5	206.0%
Viet Nam	16.3	17.0	14.9	17.4	17.4	27.5	44.2	79.1	126.1	143.4	168.3	868.1%
Other non-OECD Asia	10.6	12.8	16.7	10.2	10.3	9.4	11.4	15.5	22.1	26.6	25.3	144.7%
Asia (excl. China)	416.8	511.4	686.8	874.6	1 209.4	1 619.4	2 016.7	2 479.4	3 188.3	3 785.2	3 886.8	221.4%
People's Rep. of China	780.2	1 029.3	1 363.8	1 625.7	2 075.9	2 887.1	3 086.7	5 357.7	7 706.7	9 036.5	9 040.7	335.5%
Hong Kong, China	9.2	10.9	14.6	22.3	33.3	36.5	40.3	41.3	42.0	47.9	43.9	31.8%
China	789.4	1 040.2	1 378.4	1 648.0	2 109.2	2 923.6	3 127.1	5 399.0	7 748.6	9 084.4	9 084.6	330.7%
Argentina	82.5	85.2	95.2	87.7	99.4	117.3	139.3	149.4	173.7	185.8	191.4	92.6%
Bolivia	2.2	3.2	4.2	4.3	5.2	6.9	7.1	9.1	13.7	18.3	18.3	254.7%
Brazil	87.5	129.6	167.7	156.2	184.3	227.7	292.3	310.5	370.5	474.9	450.8	144.7%
Colombia	26.7	28.3	34.8	39.5	45.8	54.5	54.2	53.6	60.2	72.7	72.3	58.0%
Costa Rica	1.3	1.7	2.2	1.9	2.6	4.4	4.5	5.4	6.6	7.3	6.9	166.3%
Cuba	20.8	24.2	30.5	32.2	34.1	22.4	27.3	25.0	32.7	29.4	29.9	-12.4%
Curaçao ¹	14.5	10.2	8.7	4.5	2.7	2.6	5.6	6.0	4.4	4.7	4.9	82.2%
Dominican Republic	3.5	5.2	6.3	6.2	7.4	11.2	18.4	18.2	19.6	20.1	21.4	188.6%
Ecuador	3.5	5.9	10.4	11.7	13.3	16.7	18.1	23.9	32.0	38.7	37.6	182.1%
El Salvador	1.3	1.9	1.6	1.6	2.1	4.6	5.2	6.3	5.8	5.9	6.5	206.8%
Guatemala	2.3	3.0	4.2	3.2	3.2	5.9	8.6	10.6	10.3	16.1	15.1	372.1%
Haiti	0.4	0.4	0.6	0.8	0.9	0.9	1.4	2.0	2.1	2.8	3.2	243.5%
Honduras	1.1	1.3	1.7	1.7	2.2	3.6	4.5	7.2	7.3	8.7	9.2	324.3%
Jamaica	5.5	7.4	6.5	4.7	7.2	8.4	9.8	10.3	6.9	7.1	7.0	-3.4%
Nicaragua	1.5	1.8	1.8	1.8	1.8	2.5	3.5	4.0	4.3	4.5	5.1	179.7%
Panama	2.5	3.1	2.9	2.7	2.6	4.1	4.9	6.8	8.8	10.6	10.7	316.8%
Paraguay	0.6	0.7	1.3	1.4	1.9	3.5	3.3	3.5	4.7	5.2	5.7	194.5%
Peru	15.4	18.2	20.4	18.0	19.1	23.3	26.4	28.6	41.1	48.1	49.1	156.7%
Suriname	..	..	..	..	..	..	1.5	1.7	1.7	2.0	2.1	..
Trinidad and Tobago	5.4	4.6	6.4	6.7	7.9	8.2	10.1	17.5	22.3	23.2	22.8	188.5%
Uruguay	5.1	5.3	5.3	3.0	3.6	4.4	5.1	5.2	6.0	6.3	6.4	77.3%
Venezuela	45.9	56.1	83.3	85.1	93.6	106.1	116.2	137.1	171.5	154.8	136.8	46.3%
Other non-OECD Americas	8.2	10.9	10.3	9.2	12.4	13.3	13.6	14.2	16.4	19.0	19.4	56.6%
Non-OECD Americas	337.4	408.4	506.4	484.1	553.2	652.4	780.8	856.0	1 022.8	1 166.2	1 132.5	104.7%
Bahrain	2.9	5.2	7.2	9.1	10.7	13.5	15.8	20.6	25.5	29.7	30.1	181.6%
Islamic Republic of Iran	38.9	68.0	88.5	145.0	171.2	244.5	312.2	417.6	498.4	556.5	552.4	222.7%
Iraq	10.3	15.5	26.2	38.0	52.4	95.1	70.5	73.2	103.5	141.0	132.1	152.1%
Jordan	1.4	2.2	4.3	7.5	9.3	12.3	14.2	17.9	18.8	24.0	23.8	155.6%
Kuwait	14.0	15.1	26.4	36.7	27.8	32.3	46.3	64.7	77.0	79.0	85.4	207.1%
Lebanon	4.6	5.7	6.7	6.6	5.5	12.8	14.0	14.5	18.2	22.4	22.7	311.7%
Oman	0.3	0.7	2.2	5.6	10.2	14.7	20.4	25.2	42.4	59.9	64.3	532.9%
Qatar	2.2	4.9	7.0	10.7	12.4	16.8	21.3	33.2	57.1	78.4	79.9	543.2%
Saudi Arabia	12.7	22.5	99.4	117.8	151.1	191.6	234.6	298.0	419.1	506.6	531.5	251.8%
Syrian Arab Republic	5.4	8.3	12.3	19.5	27.2	31.1	37.0	53.4	55.9	27.6	26.2	-3.6%
United Arab Emirates	2.5	4.9	19.2	35.6	51.9	69.6	79.8	111.1	154.5	176.3	180.2	247.4%
Yemen	1.2	1.8	3.5	4.9	6.3	9.4	13.3	18.8	22.4	22.4	11.1	77.1%
Middle East	96.3	154.8	303.0	437.0	535.9	743.8	879.4	1 148.2	1 492.8	1 723.8	1 739.7	224.6%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - coalmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	5 229.3	5 648.0	6 600.8	7 394.2	8 286.2	8 505.9	8 962.6	11 453.7	13 725.6	14 834.2	14 512.7	75.1%
<i>Annex I Parties</i>	..	..	..	..	5 223.0	4 685.3	4 803.0	4 843.4	4 495.8	4 063.6	3 801.1	-27.2%
<i>Annex II Parties</i>	2 704.3	2 668.0	3 033.8	3 393.1	3 559.3	3 470.9	3 729.4	3 806.4	3 435.4	3 122.4	2 863.3	-19.6%
<i>North America</i>	1 169.6	1 285.1	1 515.5	1 762.8	1 933.3	2 039.2	2 297.7	2 290.5	2 074.7	1 774.2	1 539.6	-20.4%
<i>Europe</i>	1 254.1	1 080.5	1 209.5	1 251.9	1 184.1	950.4	865.7	867.1	723.8	707.7	687.5	-41.9%
<i>Asia Oceania</i>	280.6	302.4	308.9	378.4	441.9	481.2	565.9	648.8	636.9	640.4	636.2	44.0%
<i>Annex I EIT</i>	..	..	..	..	1 602.9	1 151.5	981.7	947.8	936.9	809.3	804.8	-49.8%
<i>Non-Annex I Parties</i>	..	..	..	..	3 063.2	3 820.7	4 159.5	6 610.3	9 229.8	10 770.6	10 711.6	249.7%
<i>Annex B Kyoto Parties</i>	..	..	..	..	2 380.2	1 889.1	1 669.3	1 712.2	1 595.5	1 502.3	1 440.6	-39.5%
Intl. aviation bunkers	..	..	..	..	..	..	..	..	..	..	..	..
Intl. marine bunkers	0.1	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Total	2 029.1	2 441.3	2 917.2	3 271.8	4 043.9	4 396.1	4 540.9	6 929.3	9 447.3	10 876.6	10 798.7	167.0%
OECD Total	3 200.1	3 206.7	3 683.6	4 122.3	4 242.3	4 109.8	4 421.7	4 524.5	4 278.3	3 957.6	3 714.0	-12.5%
Canada	63.9	59.0	82.1	100.8	96.2	100.7	125.9	111.3	92.6	75.6	74.5	-22.5%
Chile	5.1	3.6	4.8	5.0	9.8	8.9	11.7	10.3	17.5	24.6	28.2	188.1%
Mexico	5.2	6.7	7.3	11.7	15.1	21.8	26.4	48.1	53.6	50.1	55.0	263.6%
United States	1 105.7	1 226.1	1 433.4	1 662.0	1 837.2	1 938.5	2 171.8	2 179.2	1 982.0	1 698.7	1 465.1	-20.3%
OECD Americas	1 179.9	1 295.4	1 527.7	1 779.5	1 958.2	2 069.9	2 335.8	2 348.8	2 145.8	1 848.9	1 622.8	-17.1%
Australia	75.3	92.9	106.7	119.4	140.9	156.5	190.2	208.2	202.1	167.4	172.9	22.7%
Israel ²	0.0	0.0	0.0	7.3	9.5	16.5	25.6	29.5	29.3	26.0	25.4	168.4%
Japan	201.4	205.3	198.3	255.0	297.6	321.4	371.2	431.6	429.3	467.4	457.8	53.8%
Korea	22.2	32.1	50.5	84.0	90.7	106.5	180.4	200.0	284.2	303.8	315.4	247.5%
New Zealand	4.0	4.3	3.9	4.0	3.4	3.4	4.5	9.0	5.6	5.7	5.5	62.0%
OECD Asia Oceania	302.9	334.5	359.4	469.7	542.1	604.2	771.9	878.3	950.5	970.3	977.0	80.2%
Austria	16.3	13.9	14.2	17.4	16.6	14.4	15.1	16.3	14.4	13.3	12.8	-23.0%
Belgium	44.2	38.6	41.8	39.2	40.4	34.7	30.2	20.6	14.0	12.1	11.7	-71.1%
Czech Republic	132.2	124.3	132.3	139.1	116.7	91.5	86.4	78.1	74.2	63.6	63.0	-46.0%
Denmark	6.1	8.1	24.2	29.0	24.2	25.8	15.7	14.7	15.5	10.2	7.3	-70.0%
Estonia	..	..	..	..	24.5	11.4	10.5	12.1	14.3	14.3	11.2	-54.2%
Finland	8.7	9.6	20.1	20.3	21.7	23.8	21.6	20.8	28.8	18.7	16.2	-25.3%
France	140.1	108.2	125.5	94.4	75.9	59.2	59.6	55.9	45.8	31.3	31.9	-58.0%
Germany	558.2	499.7	561.6	592.0	516.6	380.6	346.1	334.8	314.5	317.4	316.2	-38.8%
Greece	6.7	10.9	13.2	24.9	33.6	37.2	38.4	38.6	33.6	27.5	23.7	-29.5%
Hungary	35.9	33.8	37.4	35.6	24.6	17.6	15.6	12.6	10.7	9.0	9.2	-62.5%
Iceland	0.0	-	0.1	0.3	0.3	0.2	0.4	0.4	0.4	0.4	0.4	44.0%
Ireland	8.9	7.2	8.1	10.7	14.7	12.5	10.6	11.0	8.2	8.3	9.0	-38.5%
Italy	32.6	31.3	44.4	59.8	56.5	45.4	43.9	63.8	52.4	51.8	49.1	-13.2%
Latvia	..	..	..	..	2.8	1.1	0.5	0.3	0.4	0.2	0.2	-93.4%
Luxembourg	12.3	8.1	8.4	6.7	5.2	2.1	0.4	0.3	0.3	0.2	0.2	-96.2%
Netherlands	15.2	12.4	14.4	24.0	29.9	33.7	29.7	31.0	29.0	35.1	43.2	44.7%
Norway	3.8	4.0	4.0	4.5	3.5	3.9	4.0	2.9	2.6	3.0	2.9	-17.2%
Poland	254.6	292.7	356.9	366.0	291.2	273.6	221.5	215.8	214.7	194.6	193.5	-33.6%
Portugal	2.5	1.7	1.7	2.9	10.8	14.2	15.0	13.4	6.5	10.6	12.9	19.5%
Slovak Republic	24.2	24.2	32.8	34.2	31.4	21.6	16.4	16.0	14.5	12.7	12.1	-61.6%
Slovenia	..	..	..	..	6.7	5.8	5.6	6.3	6.0	4.4	4.5	-32.8%
Spain	38.2	38.8	49.0	70.7	75.2	72.9	83.4	81.9	32.4	47.4	53.2	-29.2%
Sweden	5.5	7.0	5.5	10.7	10.5	9.6	8.3	10.0	9.2	6.8	6.9	-34.3%
Switzerland	1.9	1.0	1.4	2.0	1.4	0.8	0.6	0.6	0.6	0.6	0.5	-62.4%
Turkey	16.4	21.2	27.6	46.4	59.9	62.7	91.8	89.1	123.4	131.8	133.0	122.0%
United Kingdom	352.9	280.0	271.9	242.4	247.1	179.5	142.6	150.0	115.7	112.9	89.3	-63.8%
OECD Europe ²	1 717.3	1 576.8	1 796.6	1 873.2	1 742.0	1 435.8	1 314.0	1 297.4	1 182.1	1 138.4	1 114.2	-36.0%
<i>IEA/Accession/Association</i>	3 988.9	4 184.9	4 969.3	5 774.6	6 406.2	7 091.0	7 581.8	9 871.5	12 018.1	13 138.1	12 808.7	99.9%
<i>European Union - 28</i>	..	..	..	..	1 773.0	1 441.6	1 275.2	1 273.0	1 117.1	1 056.7	1 033.2	-41.7%
<i>G20</i>	..	..	..	..	7 436.4	7 874.2	8 325.2	10 670.2	12 816.3	13 866.4	13 543.3	82.1%
<i>Africa</i>	143.7	183.3	190.0	205.2	228.4	238.6	261.8	346.4	369.7	399.3	392.5	71.9%
<i>Americas</i>	1 197.2	1 314.6	1 556.7	1 822.7	2 005.2	2 123.7	2 403.6	2 418.5	2 226.3	1 947.7	1 724.9	-14.0%
<i>Asia</i>	..	..	..	..	3 044.5	3 834.4	4 198.2	6 597.2	9 196.6	10 739.6	10 660.2	250.2%
<i>Europe</i>	..	..	..	..	2 863.5	2 148.9	1 903.6	1 873.9	1 723.8	1 573.1	1 555.3	-45.7%
<i>Oceania</i>	80.2	97.4	110.9	123.9	144.7	160.3	195.4	217.8	209.1	174.5	179.8	24.3%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - coalmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	2 029.1	2 441.3	2 917.2	3 271.8	4 043.9	4 396.1	4 540.9	6 929.3	9 447.3	10 876.6	10 798.7	167.0%
Albania	1.2	1.6	2.5	3.8	2.4	0.1	0.1	0.1	0.5	0.4	0.4	-84.2%
Armenia	..	..	..	..	1.0	0.0	-	-	0.0	-	-	-100.0%
Azerbaijan	..	..	..	..	0.4	0.0	-	-	-	-	-	-100.0%
Belarus	..	..	..	..	9.6	5.5	3.8	2.4	2.2	3.3	3.0	-69.1%
Bosnia and Herzegovina	..	..	..	..	17.7	1.5	10.1	12.0	15.6	17.1	17.4	-1.4%
Bulgaria	34.1	36.0	38.8	43.4	37.7	30.3	26.1	28.7	28.7	26.1	27.0	-28.4%
Croatia	..	..	..	..	3.4	0.7	1.7	2.7	2.7	2.6	2.4	-28.9%
Cyprus ¹	-	-	-	0.2	0.3	0.1	0.1	0.1	0.1	0.0	0.0	-94.3%
FYR of Macedonia	..	..	..	..	5.6	6.0	5.7	6.2	5.5	4.6	4.1	-26.5%
Georgia	..	..	..	..	3.5	0.1	0.0	0.0	0.1	1.2	1.2	-67.4%
Gibraltar	..	..	..	..	-	-	-	-	-	-	-	-
Kazakhstan	..	..	..	..	158.7	114.3	74.7	102.7	137.6	136.3	121.2	-23.6%
Kosovo	..	..	..	..	..	..	4.1	5.3	7.1	5.8	6.6	..
Kyrgyzstan	..	..	..	..	10.2	1.3	1.9	2.2	2.8	4.2	4.5	-55.6%
Lithuania	..	..	..	..	3.2	1.0	0.4	0.8	0.8	0.9	0.7	-76.9%
Malta	..	..	..	0.5	0.7	0.1	-	-	-	-	-	-100.0%
Republic of Moldova	..	..	..	..	7.9	2.3	0.5	0.3	0.4	0.4	0.4	-95.0%
Montenegro	..	..	..	..	..	..	..	1.2	1.8	1.5	1.6	..
Romania	32.5	39.5	50.8	59.7	50.8	41.3	29.5	36.3	29.7	24.5	25.6	-49.6%
Russian Federation	..	..	..	..	707.3	483.7	443.2	413.7	405.0	318.4	345.9	-51.1%
Serbia	..	..	..	..	42.2	36.9	35.7	34.1	32.4	26.5	32.4	-23.2%
Tajikistan	..	..	..	..	2.5	0.1	0.0	0.2	0.4	1.5	1.8	-27.4%
Turkmenistan	..	..	..	..	1.2	-	-	-	-	-	-	-100.0%
Ukraine	..	..	..	..	292.8	166.3	120.5	122.0	132.9	134.6	106.5	-63.6%
Uzbekistan	..	..	..	..	14.0	4.5	5.2	4.7	5.5	6.5	5.9	-58.2%
Former Soviet Union ¹	884.8	1 039.7	1 138.2	987.0	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	36.7	41.5	43.7	74.1	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	989.3	1 158.3	1 274.0	1 168.6	1 373.2	896.2	763.3	775.6	811.6	716.3	708.7	-48.4%
Algeria	0.4	0.3	0.2	1.0	1.3	1.4	0.7	1.1	0.8	0.2	0.3	-79.5%
Angola	-	-	-	-	-	-	-	-	-	-	-	-
Benin	-	-	-	-	-	-	-	-	-	0.2	0.1	x
Botswana	..	..	..	1.0	1.8	2.0	2.3	2.3	0.7	3.9	3.9	113.4%
Cameroon	-	-	-	-	-	-	-	-	-	-	-	-
Congo	-	-	-	-	-	-	-	-	-	-	-	-
Côte d'Ivoire	-	-	-	-	-	-	-	-	-	-	-	-
Dem. Rep. of the Congo	1.0	0.8	0.9	0.8	0.9	-	-	-	-	-	-	-100.0%
Egypt	1.4	2.3	2.2	2.9	2.9	3.2	3.1	3.4	1.8	1.6	1.5	-48.2%
Eritrea	..	..	..	..	..	..	..	..	..	..	..	..
Ethiopia	..	..	..	..	..	..	..	..	0.1	1.0	1.0	x
Gabon	-	-	-	-	-	-	-	-	-	-	-	-
Ghana	-	-	-	-	-	-	-	-	-	-	-	-
Kenya	0.2	0.1	0.0	0.2	0.4	0.4	0.3	0.4	0.7	1.3	1.4	274.8%
Libya	-	-	-	-	-	-	-	-	-	-	-	-
Mauritius	-	-	-	0.1	0.1	0.2	0.6	0.9	1.6	1.8	1.8	+
Morocco	1.2	1.7	1.6	2.7	4.2	6.9	10.5	12.4	11.1	16.0	17.6	317.4%
Mozambique	1.5	1.2	0.7	0.3	0.1	0.1	-	-	0.0	0.0	0.0	-75.9%
Namibia	..	..	..	..	..	0.0	0.0	0.0	0.0	-	0.0	..
Niger	..	..	..	..	..	..	0.2	0.2	0.3	0.3	0.3	..
Nigeria	0.5	0.6	0.5	0.3	0.2	0.0	0.0	0.0	0.1	0.1	0.1	-38.5%
Senegal	-	-	-	-	-	-	-	0.4	0.7	0.9	1.0	x
South Africa	129.3	168.6	174.5	186.0	200.7	211.5	231.4	314.9	342.2	361.0	352.3	75.6%
South Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Sudan	-	-	0.0	-	-	-	-	-	-	-	-	-
United Rep. of Tanzania	-	-	0.0	0.0	0.0	0.1	0.2	0.1	-	0.6	0.6	+
Togo	-	-	-	-	-	-	-	-	-	-	-	-
Tunisia	0.3	0.4	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-100.0%
Zambia	2.0	1.9	1.4	1.1	0.9	0.3	0.3	0.3	0.0	0.4	0.4	-57.6%
Zimbabwe	5.8	5.2	6.2	7.7	13.7	11.5	10.3	8.2	7.4	7.7	8.1	-40.7%
Other Africa	0.1	0.2	1.6	0.6	0.9	0.5	1.5	1.7	2.3	2.2	2.2	160.7%
Africa	143.7	183.3	190.0	205.2	228.4	238.6	261.8	346.4	369.7	399.3	392.5	71.9%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - coalmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.4	0.5	0.5	0.2	1.1	1.3	1.3	1.9	3.2	3.7	9.0	707.0%
Brunei Darussalam	-	-	-	-	-	-	-	-	-	-	-	-
Cambodia	..	..	..	..	..	..	..	..	0.1	1.0	2.4	..
DPR of Korea	66.6	74.3	100.0	122.0	108.9	72.6	66.8	72.5	46.7	26.1	19.5	-82.0%
India	127.2	157.0	180.3	261.1	366.2	481.4	577.3	717.5	1 102.0	1 492.2	1 495.1	308.3%
Indonesia	0.5	0.5	0.6	4.8	18.2	26.5	52.5	87.6	107.7	149.7	164.9	806.6%
Malaysia	0.0	0.0	0.2	1.4	5.3	6.6	9.8	27.3	58.5	60.8	68.9	+
Mongolia	..	..	..	9.6	10.4	9.2	7.7	9.3	11.7	14.4	13.7	31.4%
Myanmar	0.6	0.6	0.6	0.6	0.3	0.1	1.3	1.4	1.6	1.6	1.8	555.0%
Nepal	0.0	0.1	0.2	0.0	0.2	0.3	1.0	1.0	1.2	1.9	2.2	+
Pakistan	2.6	2.2	2.7	5.0	7.3	8.0	6.9	14.6	16.4	18.8	19.5	166.7%
Philippines	0.1	0.2	1.5	5.6	5.1	6.9	19.9	22.7	29.8	45.4	49.4	872.2%
Singapore	0.0	0.0	0.0	0.1	0.1	0.1	-	0.0	0.0	1.6	1.6	+
Sri Lanka	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	4.1	5.5	+
Chinese Taipei	10.2	8.6	14.9	26.6	42.7	64.4	111.3	147.6	155.0	153.2	148.4	247.8%
Thailand	0.5	0.6	1.9	6.7	16.4	30.0	32.1	47.8	65.5	64.7	68.2	315.9%
Viet Nam	5.7	10.2	9.4	11.5	9.1	13.7	18.0	34.0	60.2	81.8	102.4	+
Other non-OECD Asia	4.5	4.9	7.8	1.0	0.8	0.6	1.4	1.7	4.4	5.5	5.2	520.3%
Asia (excl. China)	218.9	259.8	320.6	456.2	592.1	721.6	907.3	1 187.1	1 664.3	2 126.5	2 177.7	267.8%
People's Rep. of China	659.4	818.3	1 101.4	1 384.4	1 778.0	2 459.9	2 519.8	4 518.3	6 489.5	7 487.3	7 377.7	314.9%
Hong Kong, China	0.1	0.0	0.0	12.6	24.1	23.7	16.8	26.4	25.2	33.7	27.3	13.1%
China	659.5	818.4	1 101.5	1 397.1	1 802.1	2 483.6	2 536.6	4 544.7	6 514.7	7 521.0	7 405.0	310.9%
Argentina	3.3	3.4	3.2	3.6	3.6	4.9	4.8	5.9	6.1	5.5	5.2	42.9%
Bolivia	-	-	-	0.3	-	-	-	-	-	-	-	-
Brazil	6.0	6.9	15.0	26.4	27.7	32.8	46.4	45.6	54.1	67.1	68.0	145.7%
Colombia	6.1	6.7	8.8	10.2	12.2	13.9	12.1	10.5	10.8	13.6	14.7	20.2%
Costa Rica	0.0	0.0	0.0	0.0	-	-	0.0	0.1	0.3	0.4	0.3	x
Cuba	0.4	0.3	0.4	0.5	0.6	0.3	0.1	0.1	0.1	0.0	0.0	-98.2%
Curaçao ¹	-	-	-	-	-	-	-	-	-	-	-	-
Dominican Republic	-	-	-	0.5	0.0	0.2	0.2	2.0	3.0	4.0	4.2	+
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-
El Salvador	-	-	0.0	-	-	0.0	0.0	0.0	-	-	-	-
Guatemala	-	-	0.1	-	-	-	0.5	1.0	1.2	1.8	3.7	x
Haiti	-	-	-	0.1	0.0	-	-	-	-	-	-	-100.0%
Honduras	-	-	-	-	0.0	0.0	0.3	0.6	0.5	0.5	0.3	+
Jamaica	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.2	0.2	86.5%
Nicaragua	-	-	-	-	-	-	-	-	-	-	-	-
Panama	0.0	0.0	-	0.1	0.1	0.1	0.1	-	-	0.8	0.8	959.4%
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-
Peru	0.6	0.6	0.7	0.7	0.6	1.4	2.5	3.6	3.6	3.6	3.5	489.6%
Suriname	..	..	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-100.0%
Venezuela	0.6	1.1	0.7	0.8	1.9	0.0	0.5	0.1	0.8	0.8	0.5	-71.4%
Other non-OECD Americas	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	+
Non-OECD Americas	17.3	19.2	29.0	43.2	46.9	53.8	67.8	69.7	80.6	98.7	102.1	117.6%
Bahrain	-	-	-	-	-	-	-	-	-	-	-	-
Islamic Republic of Iran	0.4	2.1	2.0	1.6	1.2	1.9	3.4	4.7	2.7	4.3	4.1	239.9%
Iraq	-	-	-	-	-	-	-	-	-	-	-	-
Jordan	-	-	-	-	-	-	-	-	-	1.5	0.7	x
Kuwait	-	-	-	-	-	-	-	-	-	-	-	-
Lebanon	0.0	0.0	0.0	-	-	0.5	0.5	0.5	0.6	0.7	0.7	x
Oman	-	-	-	-	-	-	-	-	-	-	-	-
Qatar	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-
Syrian Arab Republic	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	x
United Arab Emirates	-	-	-	-	-	-	-	0.6	2.6	7.8	6.8	x
Yemen	-	-	-	-	-	-	-	-	0.4	0.5	0.3	x
Middle East	0.5	2.2	2.0	1.7	1.2	2.3	3.9	5.8	6.3	14.7	12.6	939.4%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - oilmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	6 668.1	7 581.5	8 389.8	7 772.9	8 499.2	8 792.1	9 531.7	10 286.0	10 535.2	10 958.0	11 169.1	31.4%
<i>Annex I Parties</i>	..	..	..	..	5 458.8	5 100.8	5 252.4	5 377.2	4 831.1	4 685.5	4 722.5	-13.5%
<i>Annex II Parties</i>	4 431.3	4 671.6	4 727.3	4 071.9	4 301.6	4 413.0	4 640.0	4 772.5	4 225.8	4 049.9	4 078.6	-5.2%
<i>North America</i>	2 194.9	2 297.7	2 320.0	2 087.1	2 155.2	2 164.4	2 423.8	2 578.3	2 318.0	2 299.2	2 323.7	7.8%
<i>Europe</i>	1 622.3	1 659.4	1 692.4	1 369.6	1 420.9	1 495.3	1 497.5	1 497.1	1 309.8	1 154.2	1 177.9	-17.1%
<i>Asia Oceania</i>	614.1	714.5	715.0	615.2	725.5	753.4	718.7	697.1	598.0	596.5	577.0	-20.5%
<i>Annex I EIT</i>	..	..	..	..	1 090.7	603.2	523.4	520.2	526.7	546.3	544.0	-50.1%
<i>Non-Annex I Parties</i>	..	..	..	..	2 409.9	2 972.4	3 425.2	3 914.1	4 583.5	5 140.3	5 259.8	118.3%
<i>Annex B Kyoto Parties</i>	..	..	..	..	2 037.4	1 887.9	1 833.0	1 867.7	1 698.3	1 537.7	1 574.8	-22.7%
Intl. aviation bunkers	169.2	173.9	202.1	224.9	258.9	290.3	355.8	422.8	457.7	504.5	529.7	104.6%
Intl. marine bunkers	353.7	341.1	357.3	306.8	371.6	428.5	498.4	571.9	662.9	627.7	657.0	76.8%
Non-OECD Total	1 489.3	2 077.1	2 674.7	2 735.1	3 024.0	2 990.3	3 338.6	3 827.7	4 510.5	5 123.0	5 222.2	72.7%
OECD Total	4 655.9	4 989.4	5 155.7	4 506.1	4 844.7	5 082.9	5 339.0	5 463.6	4 904.0	4 702.7	4 760.2	-1.7%
Canada	208.0	230.2	243.5	184.4	203.9	204.2	227.2	262.2	262.8	263.4	261.6	28.3%
Chile	14.6	12.4	15.1	13.1	18.7	27.2	30.3	33.6	42.3	43.5	45.2	141.5%
Mexico	69.0	103.4	156.8	178.9	193.4	213.1	251.3	255.1	251.6	245.4	243.0	25.7%
United States	1 986.9	2 067.5	2 076.4	1 902.7	1 951.2	1 960.1	2 196.6	2 316.1	2 055.2	2 035.8	2 062.0	5.7%
OECD Americas	2 278.5	2 413.5	2 491.9	2 279.0	2 367.2	2 404.7	2 705.3	2 867.0	2 611.9	2 588.2	2 611.8	10.3%
Australia	64.1	77.9	83.8	77.0	85.5	90.4	99.8	109.1	119.9	131.8	132.8	55.4%
Israel ²	13.7	16.4	18.8	17.0	23.3	28.4	29.3	26.1	28.9	19.4	20.1	-13.9%
Japan	540.7	625.0	620.5	528.6	628.3	648.9	603.1	570.2	460.9	446.7	425.7	-32.2%
Korea	30.7	45.6	75.0	71.7	132.9	226.5	205.3	185.3	163.0	151.0	162.4	22.2%
New Zealand	9.3	11.5	10.7	9.6	11.8	14.1	15.7	17.8	17.3	18.0	18.5	57.4%
OECD Asia Oceania	658.5	776.5	808.8	703.9	881.8	1 008.3	953.3	908.5	789.9	766.8	759.5	-13.9%
Austria	26.9	28.5	31.9	25.4	27.2	29.5	30.8	37.6	32.5	29.8	30.3	11.4%
Belgium	62.4	59.5	64.0	44.8	46.1	51.3	51.7	52.4	49.3	44.1	47.2	2.5%
Czech Republic	19.6	27.6	30.2	27.1	22.0	17.0	17.4	21.5	19.9	19.4	20.3	-8.1%
Denmark	49.3	44.3	38.6	30.3	22.0	24.3	23.4	21.7	19.8	16.0	16.4	-25.5%
Estonia	..	..	..	..	9.0	3.5	2.7	3.1	3.0	3.0	3.1	-65.2%
Finland	31.2	33.1	33.0	26.0	27.0	25.3	24.7	25.2	24.2	20.4	20.2	-25.2%
France	265.4	284.0	285.4	206.2	214.1	218.7	223.5	220.4	195.7	174.1	175.4	-18.1%
Germany	381.5	386.6	372.0	308.9	303.6	323.8	301.8	276.5	249.3	239.3	242.4	-20.2%
Greece	18.3	23.3	31.9	29.6	36.2	39.1	45.5	51.2	42.9	33.1	35.0	-3.4%
Hungary	18.4	26.7	29.0	26.1	21.9	18.8	16.4	15.2	14.7	15.0	16.1	-26.5%
Iceland	1.4	1.6	1.7	1.4	1.6	1.7	1.7	1.8	1.6	1.7	1.7	2.4%
Ireland	12.7	13.9	16.1	11.2	12.1	15.8	23.1	25.3	20.3	16.9	17.6	45.1%
Italy	232.6	244.6	264.5	225.1	244.7	253.0	242.4	227.2	177.6	145.6	148.7	-39.2%
Latvia	..	..	..	..	10.4	5.5	3.8	4.0	4.1	3.7	3.9	-62.7%
Luxembourg	4.1	3.8	3.0	2.9	4.5	4.8	5.9	8.2	7.4	6.9	6.6	48.7%
Netherlands	65.2	50.4	63.9	42.0	48.0	51.8	52.6	54.9	51.1	47.2	47.5	-1.0%
Norway	19.2	19.2	21.2	19.0	19.1	19.2	20.2	22.0	23.1	20.6	21.6	13.4%
Poland	21.4	32.8	41.6	37.8	33.4	39.4	49.7	56.6	65.3	56.5	59.9	79.0%
Portugal	11.9	16.4	22.1	21.0	27.1	33.0	37.9	38.7	29.8	23.7	24.4	-10.1%
Slovak Republic	12.0	14.4	17.9	13.8	11.6	6.6	5.4	8.4	9.1	8.0	8.7	-25.3%
Slovenia	..	..	..	..	5.1	6.8	6.8	7.2	7.5	6.6	6.6	29.1%
Spain	80.2	115.1	134.0	97.7	117.1	137.3	160.1	184.2	157.3	129.7	136.4	16.5%
Sweden	76.5	72.0	67.3	46.9	39.5	44.8	40.7	35.4	31.8	26.4	26.0	-34.2%
Switzerland	37.0	34.8	36.0	35.9	33.2	32.9	32.6	33.5	32.1	27.2	26.5	-20.3%
Turkey	25.3	38.4	43.9	48.8	61.2	77.3	80.7	74.9	68.9	81.3	92.4	50.9%
United Kingdom	246.4	228.3	205.8	195.3	197.8	188.9	178.7	181.0	164.0	151.4	154.1	-22.1%
OECD Europe ²	1 718.9	1 799.4	1 855.0	1 523.2	1 595.7	1 669.9	1 680.4	1 688.2	1 502.2	1 347.7	1 388.9	-13.0%
<i>IEA/Accession/Association</i>	4 858.6	5 297.3	5 567.3	4 951.4	5 421.5	5 915.1	6 400.0	6 821.0	6 605.0	6 684.1	6 877.1	26.8%
<i>European Union - 28</i>	..	..	..	..	1 593.7	1 610.9	1 607.4	1 624.3	1 436.5	1 274.4	1 305.7	-18.1%
<i>G20</i>	..	..	..	..	6 352.0	6 548.6	7 082.1	7 503.3	7 422.6	7 674.2	7 866.1	23.8%
<i>Africa</i>	100.1	131.5	182.0	216.2	241.9	263.2	298.3	361.7	446.9	509.2	524.5	116.9%
<i>Americas</i>	2 562.8	2 758.0	2 908.1	2 640.4	2 770.9	2 878.7	3 254.2	3 446.2	3 296.4	3 362.6	3 352.0	21.0%
<i>Asia</i>	..	..	..	..	2 200.7	2 707.0	2 964.4	3 301.4	3 661.6	4 066.1	4 194.5	90.6%
<i>Europe</i>	..	..	..	..	2 553.1	2 114.4	2 038.6	2 045.6	1 864.3	1 726.7	1 748.4	-31.5%
<i>Oceania</i>	76.7	94.4	99.3	91.7	102.1	109.9	122.0	136.4	145.4	161.2	162.9	59.5%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - oilmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	1 489.3	2 077.1	2 674.7	2 735.1	3 024.0	2 990.3	3 338.6	3 827.7	4 510.5	5 123.0	5 222.2	72.7%
Albania	2.4	2.2	3.5	2.4	2.8	1.7	3.0	3.7	3.4	3.7	3.4	22.4%
Armenia	..	..	..	..	10.5	0.7	0.8	1.0	1.0	0.9	0.8	-92.1%
Azerbaijan	..	..	..	..	20.9	16.8	16.9	11.9	7.4	10.0	10.5	-50.0%
Belarus	..	..	..	..	65.6	27.7	17.3	15.7	18.1	17.6	16.3	-75.2%
Bosnia and Herzegovina	..	..	..	..	5.4	1.5	3.2	3.2	4.5	4.2	4.4	-18.4%
Bulgaria	29.2	35.1	38.7	28.0	25.8	13.3	10.1	11.8	10.9	10.4	11.5	-55.6%
Croatia	..	..	..	..	12.7	10.6	11.0	12.6	10.4	8.9	9.3	-26.7%
Cyprus ¹	1.7	1.7	2.6	2.6	3.6	5.0	6.2	6.9	7.1	5.7	5.8	60.2%
FYR of Macedonia	..	..	..	..	3.0	2.3	2.7	2.6	2.6	2.6	2.8	-4.5%
Georgia	..	..	..	..	19.3	5.9	2.4	2.1	2.8	2.9	3.3	-82.9%
Gibraltar	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.5	0.6	302.1%
Kazakhstan	..	..	..	..	53.6	32.6	22.0	25.6	29.7	33.4	42.0	-21.7%
Kosovo	..	..	..	..	..	..	1.0	1.4	1.6	1.6	2.0	..
Kyrgyzstan	..	..	..	..	9.0	1.4	1.2	1.4	2.7	4.4	4.8	-46.1%
Lithuania	..	..	..	..	19.7	8.9	6.4	7.1	6.8	6.7	7.1	-64.0%
Malta	0.7	0.7	1.0	0.7	1.6	2.3	2.1	2.7	2.6	2.4	1.6	4.0%
Republic of Moldova	..	..	..	..	15.0	3.1	1.2	1.9	2.2	2.2	2.3	-84.6%
Montenegro	..	..	..	..	..	..	..	0.8	0.8	0.7	0.8	..
Romania	29.8	38.1	50.5	40.2	49.8	32.0	26.6	27.1	22.3	23.4	23.6	-52.5%
Russian Federation	..	..	..	..	618.5	340.8	318.0	293.9	297.5	336.0	329.4	-46.7%
Serbia	..	..	..	..	13.7	4.8	4.1	11.5	9.6	8.4	8.6	-37.4%
Tajikistan	..	..	..	..	5.2	1.2	0.7	0.9	1.6	2.5	2.5	-52.6%
Turkmenistan	..	..	..	..	14.7	6.9	11.1	14.6	16.2	18.8	19.0	29.1%
Ukraine	..	..	..	..	185.1	72.5	31.9	35.8	37.3	31.0	28.3	-84.7%
Uzbekistan	..	..	..	..	24.9	18.5	17.8	13.3	10.2	7.4	7.2	-71.2%
Former Soviet Union ¹	635.5	937.1	1 119.7	1 102.5	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	23.8	29.9	35.6	34.5	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	723.1	1 044.7	1 251.7	1 211.1	1 180.4	610.8	517.8	510.0	509.7	546.3	547.8	-53.6%
Algeria	5.8	8.6	14.1	19.2	23.7	22.7	24.9	31.4	43.4	54.2	57.5	142.9%
Angola	1.5	1.8	2.5	2.6	2.9	2.8	3.5	4.9	13.7	18.7	18.9	556.5%
Benin	0.3	0.5	0.4	0.5	0.3	0.2	1.4	2.7	4.6	4.6	5.2	+
Botswana	..	..	..	0.5	1.0	1.2	1.7	2.0	2.6	3.1	3.2	220.9%
Cameroon	0.7	1.0	1.7	2.4	2.6	2.5	2.8	2.9	4.6	5.2	5.5	106.6%
Congo	0.6	0.6	0.7	0.8	0.6	0.5	0.5	0.8	1.6	2.2	2.2	248.8%
Côte d'Ivoire	2.4	3.0	3.4	3.0	2.7	3.2	3.4	2.9	3.1	5.1	5.7	109.4%
Dem. Rep. of the Congo	1.6	1.8	2.3	2.4	2.1	1.1	0.9	1.3	1.8	4.7	2.7	31.1%
Egypt	18.5	23.2	35.8	54.9	61.6	57.7	66.8	78.5	100.8	116.7	119.9	94.8%
Eritrea	..	..	..	..	..	0.8	0.6	0.6	0.5	0.6	0.6	..
Ethiopia	1.3	1.2	1.4	1.4	2.2	2.3	3.2	4.5	5.9	9.1	9.2	323.6%
Gabon	0.5	0.8	1.3	1.6	0.7	1.1	1.2	1.4	2.0	2.6	2.5	260.3%
Ghana	1.9	2.3	2.2	2.1	2.5	3.2	5.0	6.4	9.6	11.9	11.5	355.0%
Kenya	3.0	3.3	4.4	4.4	5.1	5.3	7.5	7.1	10.6	11.0	12.8	147.9%
Libya	1.6	6.2	12.3	15.0	17.7	26.0	29.9	34.6	37.9	36.7	34.2	92.6%
Mauritius	0.3	0.4	0.6	0.5	1.0	1.4	1.8	2.1	2.0	2.1	2.2	115.1%
Morocco	5.3	7.8	11.9	13.4	15.3	19.2	18.9	25.6	33.6	34.8	34.5	125.2%
Mozambique	1.5	1.2	1.7	1.3	0.9	1.0	1.3	1.5	2.2	2.9	3.5	267.7%
Namibia	..	..	..	..	..	1.8	1.9	2.4	3.0	3.6	3.8	..
Niger	..	..	..	..	..	..	0.5	0.5	1.1	1.6	1.7	..
Nigeria	4.8	9.1	22.0	24.6	21.0	23.5	29.1	37.7	36.4	31.7	34.6	65.2%
Senegal	1.2	1.6	2.0	2.1	2.1	2.4	3.5	4.2	4.7	5.3	5.6	164.7%
South Africa	27.8	34.4	33.9	36.9	43.1	48.2	49.1	57.4	62.6	69.6	71.2	65.0%
South Sudan	..	..	..	..	..	..	..	..	..	1.5	1.1	..
Sudan	3.2	3.2	3.7	4.0	5.3	4.3	5.5	9.9	15.0	13.4	15.4	190.8%
United Rep. of Tanzania	1.4	1.4	1.5	1.4	1.7	2.4	2.4	4.2	4.6	8.0	9.3	458.7%
Togo	0.3	0.3	0.4	0.3	0.6	0.6	0.9	1.0	2.1	1.8	1.9	225.4%
Tunisia	3.4	4.0	6.8	7.2	9.0	9.1	10.9	11.7	11.4	12.7	13.8	52.8%
Zambia	1.4	2.4	1.8	1.6	1.7	1.7	1.4	1.8	1.6	2.8	2.9	73.9%
Zimbabwe	1.5	2.0	1.7	2.0	2.6	3.6	3.0	2.1	1.9	3.8	3.7	42.8%
Other Africa	8.3	9.4	11.7	10.2	11.8	13.6	14.9	17.8	22.1	27.2	27.7	135.6%
Africa	100.1	131.5	182.0	216.2	241.9	263.2	298.3	361.7	446.9	509.2	524.5	116.9%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - oilmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	2.2	3.3	4.6	4.4	4.9	7.1	7.9	11.0	10.9	16.2	15.7	219.2%
Brunei Darussalam	0.2	0.2	0.5	0.6	0.7	1.1	1.2	1.3	1.7	1.9	1.9	160.4%
Cambodia	..	..	..	..	..	1.5	2.0	2.6	4.6	5.1	5.7	..
DPR of Korea	2.6	4.3	8.1	7.5	8.0	4.0	3.1	2.9	2.6	2.6	3.0	-62.3%
India	52.8	58.9	80.0	109.9	151.1	201.3	276.9	307.7	395.9	468.0	515.9	241.4%
Indonesia	24.6	36.8	61.6	70.4	91.4	130.3	157.4	180.1	197.2	207.1	199.2	118.0%
Malaysia	12.7	16.1	23.3	26.9	37.6	48.8	56.7	64.6	68.2	86.9	80.9	115.4%
Mongolia	..	..	..	2.2	2.4	1.1	1.3	1.7	2.5	3.5	3.5	42.7%
Myanmar	3.8	3.0	3.9	3.5	2.1	4.0	5.4	6.2	3.3	12.8	16.0	678.3%
Nepal	0.2	0.2	0.3	0.5	0.7	1.5	2.1	2.1	2.9	3.9	3.4	365.3%
Pakistan	8.4	10.5	12.7	20.7	30.7	45.6	56.6	47.7	60.7	72.0	75.4	145.4%
Philippines	22.9	28.8	31.8	22.9	33.0	50.3	48.2	42.1	40.1	43.1	47.7	44.8%
Singapore	6.0	8.4	12.5	16.4	28.6	34.0	38.9	23.8	26.5	20.5	19.5	-31.6%
Sri Lanka	2.8	2.6	3.6	3.5	3.7	5.4	10.5	13.1	12.1	12.7	14.0	284.0%
Chinese Taipei	18.0	30.0	53.2	41.1	65.4	82.2	89.3	83.3	68.7	59.9	61.8	-5.4%
Thailand	15.8	20.6	31.8	28.5	52.8	89.5	79.4	91.5	83.2	96.0	94.6	79.3%
Viet Nam	10.6	6.7	5.5	5.8	8.2	13.3	23.6	34.1	46.8	40.6	43.9	433.2%
Other non-OECD Asia	5.6	7.4	8.6	8.0	8.9	8.3	9.5	13.3	16.9	20.4	19.4	117.4%
Asia (excl. China)	189.2	237.6	342.1	372.8	530.1	729.2	869.9	929.1	1 044.7	1 173.2	1 221.5	130.4%
People's Rep. of China	113.4	193.5	234.2	225.0	278.1	400.4	531.1	768.0	1 006.8	1 186.4	1 285.5	362.2%
Hong Kong, China	9.1	10.8	14.4	9.3	8.4	11.6	16.5	8.4	8.8	8.7	9.7	15.4%
China	122.5	204.3	248.6	234.3	286.5	412.0	547.6	776.4	1 015.7	1 195.2	1 295.2	352.0%
Argentina	67.0	64.6	70.3	53.7	52.4	60.2	64.4	66.4	80.3	84.5	88.4	68.7%
Bolivia	2.0	2.9	3.7	3.3	3.7	4.5	4.7	5.7	8.0	10.8	11.4	208.3%
Brazil	80.9	121.6	151.1	126.1	150.9	187.4	229.5	227.8	266.5	330.1	306.2	102.9%
Colombia	18.0	18.4	20.2	21.9	26.0	32.1	29.2	28.7	30.9	39.4	38.4	47.8%
Costa Rica	1.3	1.7	2.2	1.9	2.6	4.4	4.5	5.3	6.3	6.9	6.6	153.3%
Cuba	20.3	23.6	29.9	31.5	33.4	22.0	26.1	23.5	30.6	27.1	27.5	-17.6%
Curaçao ¹	14.5	10.2	8.7	4.5	2.7	2.6	5.6	6.0	4.4	4.7	4.9	82.2%
Dominican Republic	3.5	5.2	6.3	5.7	7.4	11.0	18.1	15.8	15.1	14.0	15.0	104.3%
Ecuador	3.5	5.9	10.4	11.7	13.3	16.7	18.1	23.3	31.1	37.3	36.3	172.3%
El Salvador	1.3	1.9	1.6	1.6	2.1	4.6	5.2	6.2	5.8	5.9	6.5	206.8%
Guatemala	2.3	3.0	4.2	3.2	3.2	5.9	8.1	9.6	9.1	14.4	11.4	255.8%
Haiti	0.4	0.4	0.6	0.6	0.9	0.9	1.4	2.0	2.1	2.8	3.2	254.6%
Honduras	1.1	1.3	1.7	1.7	2.2	3.6	4.2	6.6	6.9	8.3	9.0	312.1%
Jamaica	5.5	7.4	6.5	4.7	7.1	8.3	9.7	10.1	6.8	6.9	6.8	-5.0%
Nicaragua	1.5	1.8	1.8	1.8	1.8	2.5	3.5	4.0	4.3	4.5	5.1	179.7%
Panama	2.5	3.1	2.9	2.6	2.5	4.0	4.7	6.8	8.8	9.8	9.9	296.6%
Paraguay	0.6	0.7	1.3	1.4	1.9	3.5	3.3	3.5	4.7	5.2	5.7	194.5%
Peru	14.2	16.8	18.7	16.0	17.5	21.3	22.8	21.1	24.6	26.1	27.7	58.1%
Suriname	..	..	..	..	..	..	1.5	1.7	1.7	2.0	2.1	..
Trinidad and Tobago	2.6	2.3	2.5	2.2	2.1	2.2	2.6	3.9	4.8	4.4	4.8	131.1%
Uruguay	5.0	5.3	5.3	3.0	3.6	4.4	5.0	5.0	5.8	6.2	6.3	75.2%
Venezuela	28.4	35.3	56.2	53.1	54.1	58.7	63.9	83.4	111.0	106.2	90.1	66.5%
Other non-OECD Americas	8.1	10.8	10.1	9.2	12.3	13.2	12.9	12.8	14.9	17.0	17.3	40.4%
Non-OECD Americas	284.4	344.5	416.2	361.4	403.6	474.0	548.9	579.2	684.5	774.4	740.2	83.4%
Bahrain	1.1	1.1	1.5	1.6	2.0	2.3	2.4	3.5	3.8	4.0	4.4	123.1%
Islamic Republic of Iran	33.0	57.8	77.9	126.5	136.2	166.4	190.8	223.3	221.5	233.0	205.8	51.1%
Iraq	8.5	12.4	23.8	36.3	48.6	89.1	64.4	69.7	93.7	128.6	119.3	145.4%
Jordan	1.4	2.2	4.3	7.5	9.1	11.8	13.7	14.7	13.4	21.8	18.5	104.0%
Kuwait	4.1	5.2	13.2	27.0	16.2	14.5	27.9	41.1	49.1	43.8	45.3	178.8%
Lebanon	4.6	5.7	6.6	6.6	5.5	12.3	13.5	13.9	17.1	21.7	22.0	299.7%
Oman	0.3	0.7	1.5	3.5	5.2	7.9	8.7	10.4	11.3	17.6	18.4	252.6%
Qatar	0.3	0.7	1.4	1.6	1.9	2.4	2.8	6.6	14.1	17.9	17.2	805.4%
Saudi Arabia	10.0	17.1	78.5	89.0	107.9	137.0	167.8	196.5	288.2	354.0	375.1	247.7%
Syrian Arab Republic	5.4	8.2	12.2	19.2	24.0	27.1	29.6	44.5	40.2	19.3	18.9	-21.1%
United Arab Emirates	0.4	1.6	9.5	15.7	18.6	20.9	21.0	28.3	36.5	42.9	39.2	110.8%
Yemen	1.2	1.8	3.5	4.9	6.3	9.4	13.3	18.8	20.0	20.1	8.9	41.4%
Middle East	70.1	114.4	234.0	339.3	381.4	501.0	555.9	671.3	809.1	924.7	893.0	134.1%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - natural gasmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	2 043.6	2 249.4	2 709.2	3 070.1	3 679.9	3 984.6	4 550.2	5 206.4	6 026.0	6 358.3	6 437.0	74.9%
<i>Annex I Parties</i>	..	..	..	..	2 999.0	3 117.7	3 400.2	3 567.6	3 787.8	3 761.1	3 757.0	25.3%
<i>Annex II Parties</i>	1 443.2	1 500.2	1 652.2	1 600.4	1 760.2	2 090.6	2 384.9	2 458.4	2 657.7	2 657.3	2 710.6	54.0%
<i>North America</i>	1 263.7	1 149.2	1 181.6	1 057.5	1 113.6	1 287.1	1 396.3	1 347.2	1 458.8	1 626.4	1 662.0	49.2%
<i>Europe</i>	166.6	322.5	401.0	431.9	491.7	620.0	770.4	875.7	908.5	689.8	719.7	46.4%
<i>Asia Oceania</i>	12.8	28.6	69.6	110.9	154.9	183.4	218.1	235.4	290.5	341.1	329.0	112.4%
<i>Annex I EIT</i>	..	..	..	..	1 232.5	1 015.0	986.4	1 056.9	1 056.8	1 010.6	954.9	-22.5%
<i>Non-Annex I Parties</i>	..	..	..	..	680.9	866.9	1 150.0	1 638.8	2 238.3	2 597.2	2 680.0	293.6%
<i>Annex B Kyoto Parties</i>	..	..	..	..	943.9	986.6	1 120.6	1 261.7	1 283.1	1 027.5	1 046.0	10.8%
Intl. aviation bunkers	..	..	..	..	..	..	..	..	..	..	..	..
Intl. marine bunkers	..	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Total	558.7	695.0	973.0	1 368.2	1 790.0	1 738.5	1 932.9	2 421.8	2 968.2	3 278.7	3 302.4	84.5%
OECD Total	1 484.9	1 554.5	1 736.2	1 701.9	1 889.9	2 246.1	2 617.3	2 784.6	3 057.8	3 079.6	3 134.6	65.9%
Canada	68.2	87.8	96.5	108.6	119.1	143.3	162.5	167.0	172.1	214.4	212.0	78.1%
Chile	1.3	1.1	1.4	1.6	0.9	1.0	6.7	10.6	8.7	7.7	8.3	782.6%
Mexico	19.6	24.5	40.4	50.5	48.4	56.3	82.0	109.1	135.1	138.4	144.2	198.1%
United States	1 195.5	1 061.4	1 085.1	949.0	994.6	1 143.8	1 233.8	1 180.2	1 286.6	1 412.0	1 449.9	45.8%
OECD Americas	1 284.6	1 174.7	1 223.5	1 109.7	1 163.0	1 344.4	1 485.0	1 466.9	1 602.6	1 772.6	1 814.5	56.0%
Australia	4.0	8.6	16.3	23.8	32.3	37.4	43.6	54.0	66.6	73.6	74.7	131.4%
Israel ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	10.2	15.9	16.8	+
Japan	8.6	19.3	51.5	81.9	116.1	139.6	165.8	174.5	216.4	260.0	247.2	113.0%
Korea	-	-	-	-	6.4	19.5	40.1	64.1	91.2	99.8	93.3	+
New Zealand	0.2	0.6	1.9	5.3	6.6	6.4	8.7	6.9	7.5	7.5	7.1	8.3%
OECD Asia Oceania	12.9	28.6	69.6	110.9	161.3	202.9	258.3	302.7	391.9	456.8	439.1	172.2%
Austria	5.4	7.1	8.3	9.5	11.4	14.4	14.6	18.1	18.1	14.0	15.3	34.5%
Belgium	11.3	17.4	19.6	16.2	18.3	23.3	29.5	31.9	36.8	27.8	30.3	65.0%
Czech Republic	1.9	3.1	5.6	9.2	11.5	14.6	17.1	17.9	17.3	14.0	14.7	27.9%
Denmark	-	0.0	0.0	1.5	4.2	7.4	10.4	10.5	10.3	6.6	6.7	60.4%
Estonia	..	..	..	..	2.4	1.1	1.3	1.6	1.3	1.0	0.9	-62.4%
Finland	-	1.5	1.7	1.9	5.1	6.6	8.0	8.4	8.3	5.4	4.6	-8.5%
France	17.7	30.7	44.2	51.1	53.3	62.8	77.9	91.5	94.8	73.7	77.8	45.8%
Germany	38.4	84.1	111.2	101.1	115.2	144.9	155.8	168.4	176.6	147.4	152.1	32.1%
Greece	-	-	-	0.0	0.1	0.1	3.7	5.2	6.7	5.0	5.4	+
Hungary	6.0	9.7	16.2	18.0	19.0	19.8	21.2	26.6	21.4	15.4	16.4	-13.6%
Iceland	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	-	-	1.7	4.5	3.3	4.4	7.1	8.0	10.8	8.4	8.5	156.4%
Italy	24.1	41.0	46.3	57.0	87.0	101.8	133.1	162.4	157.3	117.2	127.9	46.9%
Latvia	..	..	..	..	5.6	2.3	2.5	3.2	3.4	2.5	2.6	-54.1%
Luxembourg	0.0	0.8	1.0	0.7	1.0	1.3	1.6	2.8	2.8	2.0	1.8	80.1%
Netherlands	47.3	69.1	67.0	72.3	68.9	76.7	77.0	78.3	87.1	63.0	62.2	-9.8%
Norway	-	0.4	2.0	2.8	4.6	8.1	7.4	9.3	11.2	10.9	11.2	141.9%
Poland	10.3	11.5	15.2	15.6	15.5	15.4	17.8	23.2	25.5	25.2	26.1	68.1%
Portugal	-	-	-	-	-	-	4.6	8.7	10.5	7.6	9.1	x
Slovak Republic	2.7	4.4	4.9	6.4	11.7	11.8	13.2	12.6	10.9	7.6	7.6	-35.2%
Slovenia	..	..	..	..	1.8	1.5	1.6	1.9	1.8	1.5	1.5	-14.1%
Spain	0.7	1.8	3.1	4.5	10.0	16.9	34.1	66.8	71.6	54.1	56.4	463.6%
Sweden	-	-	-	0.2	1.3	1.6	1.6	1.7	3.0	1.7	1.8	41.2%
Switzerland	0.0	1.0	1.9	2.9	3.8	5.1	5.7	6.5	7.1	6.3	6.7	77.2%
Turkey	-	-	-	0.1	6.3	12.2	28.9	52.3	73.3	93.2	91.4	+
United Kingdom	21.7	67.5	92.8	105.7	104.1	144.5	198.3	197.2	195.4	138.7	141.9	36.3%
OECD Europe ²	187.4	351.2	443.0	481.3	565.6	698.8	874.1	1 015.0	1 063.4	850.3	881.1	55.8%
<i>IEA/Accession/Association</i>	1 493.5	1 573.9	1 771.7	1 738.7	1 951.7	2 365.1	2 774.3	3 028.1	3 489.8	3 631.9	3 703.2	89.7%
<i>European Union - 28</i>	..	..	..	..	643.2	731.8	875.1	990.4	1 009.0	771.1	803.0	24.8%
<i>G20</i>	..	..	..	..	2 953.9	3 208.0	3 604.7	3 944.1	4 485.5	4 669.4	4 703.0	59.2%
<i>Africa</i>	5.3	9.0	25.6	44.3	58.8	74.4	98.0	148.9	179.0	212.9	222.9	279.3%
<i>Americas</i>	1 320.4	1 219.4	1 284.6	1 189.2	1 265.6	1 469.0	1 649.0	1 674.0	1 860.4	2 065.7	2 104.6	66.3%
<i>Asia</i>	..	..	..	..	577.2	752.5	985.2	1 379.1	1 937.0	2 289.4	2 343.6	306.0%
<i>Europe</i>	..	..	..	..	1 739.3	1 644.7	1 765.4	1 942.9	1 975.1	1 709.1	1 683.8	-3.2%
<i>Oceania</i>	4.2	9.3	18.1	29.1	39.0	44.0	52.6	61.4	74.6	81.4	82.1	110.4%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - natural gasmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	558.7	695.0	973.0	1 368.2	1 790.0	1 738.5	1 932.9	2 421.8	2 968.2	3 278.7	3 302.4	84.5%
Albania	0.2	0.6	0.8	0.8	0.5	0.1	0.0	0.0	0.0	0.1	0.1	-86.5%
Armenia	..	..	..	..	8.4	2.7	2.6	3.1	3.0	4.3	3.9	-53.8%
Azerbaijan	..	..	..	..	32.2	15.5	10.4	17.1	16.1	20.7	20.2	-37.3%
Belarus	..	..	..	..	24.7	23.7	30.9	36.8	39.4	36.3	33.8	37.1%
Bosnia and Herzegovina	..	..	..	..	0.9	0.3	0.5	0.7	0.5	0.4	0.4	-55.7%
Bulgaria	0.6	2.3	7.5	10.8	11.0	9.2	6.0	5.7	4.8	4.9	5.1	-53.4%
Croatia	..	..	..	..	4.2	3.4	4.0	4.5	5.1	3.5	3.7	-11.5%
Cyprus ¹	-	-	-	-	-	-	-	-	-	-	-	-
FYR of Macedonia	..	..	..	..	-	-	0.1	0.1	0.2	0.3	0.3	x
Georgia	..	..	..	..	10.7	2.2	2.2	1.9	2.1	3.6	3.9	-63.1%
Gibraltar	..	..	..	..	-	-	-	-	-	-	-	-
Kazakhstan	..	..	..	..	24.9	23.6	15.3	28.6	53.8	60.1	61.9	148.4%
Kosovo	..	..	..	..	..	..	-	-	-	-	-	..
Kyrgyzstan	..	..	..	..	3.6	1.7	1.3	1.2	0.5	0.5	0.5	-85.9%
Lithuania	..	..	..	..	9.4	3.5	3.5	4.6	4.7	2.8	2.6	-71.8%
Malta	..	..	..	..	-	-	-	-	-	-	-	-
Republic of Moldova	..	..	..	..	7.6	6.5	4.8	5.5	5.3	4.7	4.9	-36.1%
Montenegro	..	..	..	..	..	..	-	-	-	-	-	..
Romania	52.3	62.9	76.0	75.0	67.7	42.3	29.5	28.7	22.6	19.9	19.8	-70.7%
Russian Federation	..	..	..	..	837.4	709.4	695.1	753.6	802.5	806.6	765.2	-8.6%
Serbia	..	..	..	..	6.1	2.8	3.2	4.0	3.8	3.3	3.5	-41.8%
Tajikistan	..	..	..	..	3.3	1.2	1.5	1.3	0.4	0.0	0.0	-99.8%
Turkmenistan	..	..	..	..	28.8	26.3	25.6	33.5	40.7	48.2	50.1	74.2%
Ukraine	..	..	..	..	210.4	156.9	142.7	136.1	96.0	69.2	54.6	-74.0%
Uzbekistan	..	..	..	..	75.9	71.6	90.9	89.2	81.4	84.0	82.5	8.7%
Former Soviet Union ¹	421.4	503.7	677.7	988.6	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	1.3	2.1	4.9	11.0	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	475.8	571.6	766.9	1 086.2	1 367.7	1 102.9	1 070.2	1 156.2	1 182.9	1 173.3	1 117.3	-18.3%
Algeria	2.4	4.6	13.5	21.8	26.2	31.2	35.9	44.9	51.3	68.7	72.6	177.1%
Angola	0.1	0.1	0.2	0.2	1.0	1.1	1.1	1.2	1.4	0.6	1.5	42.6%
Benin	-	-	-	-	-	-	-	-	-	-	-	-
Botswana	..	..	..	..	-	-	-	-	-	-	-	-
Cameroon	..	..	..	..	-	-	-	-	0.5	0.5	0.6	x
Congo	0.0	0.0	-	0.0	-	-	-	0.0	0.2	0.5	0.5	x
Côte d'Ivoire	-	-	-	-	-	0.1	3.0	2.9	3.1	3.9	4.0	x
Dem. Rep. of the Congo	-	-	-	-	-	-	-	-	0.0	0.0	0.0	x
Egypt	0.2	0.1	2.8	6.6	13.4	20.8	29.8	62.8	73.8	74.9	77.2	476.5%
Eritrea	..	..	..	..	..	..	..	..	..	..	..	..
Ethiopia	..	..	..	..	..	..	..	..	..	..	..	..
Gabon	-	-	0.0	0.1	0.2	0.3	0.2	0.3	0.6	0.7	0.7	244.7%
Ghana	-	-	-	-	-	-	-	-	0.8	1.3	2.5	x
Kenya	-	-	-	-	-	-	-	-	-	-	-	-
Libya	2.1	2.5	5.3	6.2	8.1	7.0	6.9	8.4	10.2	11.2	11.1	37.6%
Mauritius	-	-	-	-	-	-	-	-	-	-	-	-
Morocco	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.9	1.3	2.4	2.4	+
Mozambique	-	-	-	-	-	0.0	0.0	0.0	0.2	0.9	1.5	x
Namibia	..	..	..	..	..	..	..	..	..	..	..	..
Niger	..	..	..	..	..	..	..	..	..	..	..	..
Nigeria	0.4	1.0	2.9	7.0	6.9	9.3	14.7	18.7	19.3	28.3	29.7	329.6%
Senegal	-	-	-	-	0.0	0.1	0.0	0.0	0.0	0.1	0.1	551.7%
South Africa	-	-	-	-	-	-	-	-	1.9	4.0	4.1	x
South Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Sudan	-	-	-	-	-	-	-	-	-	-	-	-
United Rep. of Tanzania	-	-	-	-	-	-	-	0.8	1.5	1.8	1.7	x
Togo	-	-	-	-	-	-	-	-	-	-	-	-
Tunisia	0.0	0.5	0.8	2.2	2.8	4.6	6.4	7.8	11.9	12.4	11.8	319.6%
Zambia	-	-	-	-	-	-	-	-	-	-	-	-
Zimbabwe	-	-	-	-	-	-	-	-	-	-	-	-
Other Africa	-	-	-	-	-	-	0.0	0.1	0.9	0.9	1.0	x
Africa	5.3	9.0	25.6	44.3	58.8	74.4	98.0	148.9	179.0	212.9	222.9	279.3%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from fuel combustion - natural gasmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.3	0.6	1.5	3.1	5.4	8.1	11.7	19.0	35.8	43.0	45.8	750.3%
Brunei Darussalam	0.2	1.2	2.1	2.3	2.5	3.4	3.2	3.5	5.1	4.8	4.1	60.9%
Cambodia	..	..	..	..	..	..	..	..	..	..	..	..
DPR of Korea	-	-	-	-	-	-	-	-	-	-	-	-
India	1.0	1.3	1.8	4.7	13.1	25.0	36.2	54.3	95.7	57.3	53.6	309.0%
Indonesia	0.1	0.5	5.4	8.7	24.3	47.3	45.4	50.9	71.3	78.1	77.8	219.9%
Malaysia	0.0	0.1	0.2	4.6	6.8	24.1	48.5	63.9	63.1	72.7	70.5	942.6%
Mongolia	..	..	..	-	-	-	-	-	-	-	-	-
Myanmar	0.1	0.3	0.6	1.6	1.6	2.7	2.6	3.0	3.0	5.6	6.6	315.5%
Nepal	-	-	-	-	-	-	-	-	-	-	-	-
Pakistan	4.9	7.2	8.9	10.8	17.9	25.6	30.9	52.6	52.5	50.8	51.1	185.5%
Philippines	-	-	-	-	-	0.0	0.0	6.7	7.2	7.2	6.8	x
Singapore	0.0	0.1	0.1	0.1	0.1	3.2	2.9	13.3	16.7	22.0	22.1	+
Sri Lanka	-	-	-	-	-	-	-	-	-	-	-	-
Chinese Taipei	1.6	2.2	3.3	1.5	3.0	7.4	12.9	20.8	30.6	34.0	36.6	+
Thailand	-	-	-	6.9	11.7	20.5	40.8	60.9	74.7	83.2	84.7	622.1%
Viet Nam	-	-	-	0.1	0.0	0.4	2.6	11.0	19.1	21.0	22.0	+
Other non-OECD Asia	0.5	0.5	0.2	1.2	0.6	0.5	0.5	0.5	0.9	0.6	0.7	15.9%
Asia (excl. China)	8.7	14.0	24.2	45.7	87.1	168.2	238.2	360.5	475.5	480.4	482.3	453.8%
People's Rep. of China	7.4	17.4	28.1	16.2	19.8	26.8	35.8	71.5	187.7	329.1	348.8	+
Hong Kong, China	0.1	0.1	0.2	0.4	0.8	1.2	7.1	6.5	8.0	5.5	6.9	804.8%
China	7.4	17.5	28.3	16.6	20.6	28.0	42.9	78.0	195.6	334.7	355.7	+
Argentina	12.1	17.1	21.7	30.4	43.3	52.2	70.2	77.1	87.3	95.9	97.8	125.7%
Bolivia	0.1	0.3	0.6	0.8	1.5	2.3	2.4	3.4	5.7	7.5	6.9	373.1%
Brazil	0.5	1.0	1.6	3.7	5.7	7.5	16.4	37.1	49.9	77.7	76.7	+
Colombia	2.6	3.3	5.7	7.4	7.6	8.4	12.8	14.4	18.5	19.6	19.2	154.2%
Costa Rica	-	-	-	-	-	-	-	-	-	-	-	-
Cuba	0.1	0.2	0.1	0.1	0.1	0.2	1.1	1.4	2.0	2.3	2.4	+
Curaçao ¹	-	-	-	-	-	-	-	-	-	-	-	-
Dominican Republic	-	-	-	-	-	-	-	0.4	1.5	2.1	2.1	x
Ecuador	-	-	-	-	-	-	-	0.7	1.0	1.4	1.3	x
El Salvador	-	-	-	-	-	-	-	-	-	-	-	-
Guatemala	-	-	-	-	-	-	-	-	-	-	-	-
Haiti	-	-	-	-	-	-	-	-	-	-	-	-
Honduras	-	-	-	-	-	-	-	-	-	-	-	-
Jamaica	-	-	-	-	-	-	-	-	-	-	-	-
Nicaragua	-	-	-	-	-	-	-	-	-	-	-	-
Panama	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-
Peru	0.6	0.8	1.0	1.3	1.0	0.6	1.1	3.9	12.9	18.3	17.9	+
Suriname	..	..	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	2.8	2.3	3.9	4.5	5.8	6.0	7.5	13.6	17.6	18.8	18.0	208.8%
Uruguay	-	-	-	-	-	-	0.1	0.2	0.1	0.1	0.1	x
Venezuela	16.9	19.7	26.5	31.2	37.6	47.3	51.7	53.6	59.6	47.9	46.2	23.0%
Other non-OECD Americas	0.0	-	0.0	0.1	0.0	0.0	0.7	1.4	1.6	1.6	1.6	+
Non-OECD Americas	35.8	44.7	61.1	79.5	102.7	124.6	164.0	207.1	257.8	293.1	290.2	182.6%
Bahrain	1.8	4.1	5.7	7.5	8.7	11.2	13.4	17.1	21.7	25.7	25.7	194.8%
Islamic Republic of Iran	5.5	8.1	8.6	16.9	33.8	76.2	118.0	189.6	274.2	319.2	342.4	913.9%
Iraq	1.8	3.2	2.5	1.6	3.8	6.1	6.0	3.5	9.8	12.4	12.8	237.1%
Jordan	-	-	-	-	0.2	0.5	0.5	3.2	5.4	0.7	4.6	+
Kuwait	10.0	9.9	13.2	9.7	11.6	17.8	18.4	23.6	27.9	35.2	40.1	246.8%
Lebanon	-	-	-	-	-	-	-	-	0.5	-	-	-
Oman	-	-	0.7	2.1	4.9	6.8	11.7	14.8	31.1	42.3	45.9	828.8%
Qatar	1.9	4.2	5.6	9.1	10.5	14.4	18.5	26.6	43.0	60.5	62.8	496.0%
Saudi Arabia	2.7	5.4	20.9	28.8	43.2	54.6	66.8	101.5	130.8	152.5	156.3	261.9%
Syrian Arab Republic	-	-	0.1	0.3	3.2	4.0	7.4	8.9	15.7	8.3	7.3	127.1%
United Arab Emirates	2.1	3.3	9.7	19.9	33.3	48.8	58.8	82.2	115.4	125.6	134.2	303.2%
Yemen	-	-	-	-	-	-	-	-	1.9	1.9	1.9	x
Middle East	25.7	38.2	67.0	96.0	153.3	240.4	319.5	471.1	677.4	784.4	834.1	444.2%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from international marine bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World	353.79	341.07	357.33	306.76	371.64	428.54	498.37	571.92	662.94	627.73	657.04	76.8%
<i>Annex I Parties</i>	..	..	..	..	236.59	231.40	252.85	271.72	268.84	248.12	246.29	4.1%
<i>Annex II Parties</i>	205.15	219.47	237.59	173.40	226.06	227.86	247.08	262.19	254.54	190.25	185.67	-17.9%
<i>North America</i>	26.68	36.49	94.86	57.00	94.49	94.63	93.17	85.44	85.67	47.35	41.52	-56.1%
<i>Europe</i>	121.84	111.91	98.45	89.11	110.46	111.13	133.01	152.95	150.63	128.21	126.75	14.7%
<i>Asia Oceania</i>	56.64	71.08	44.28	27.29	21.11	22.10	20.90	23.79	18.24	14.69	17.40	-17.6%
<i>Annex I EIT</i>	..	..	..	..	9.88	2.60	1.82	3.17	7.91	50.05	52.24	428.8%
<i>Non-Annex I Parties</i>	..	..	..	..	135.05	197.14	245.51	300.20	394.10	379.61	410.75	204.1%
<i>Annex B Kyoto Parties</i>	..	..	..	..	116.85	116.91	140.51	161.91	161.11	138.11	138.34	18.4%
Non-OECD Total	144.31	118.15	115.91	127.96	135.60	172.97	211.57	263.65	371.06	400.91	431.92	218.5%
OECD Total	209.48	222.92	241.43	178.80	236.04	255.57	286.80	308.27	291.88	226.82	225.12	-4.6%
Canada	3.10	2.61	4.76	1.19	2.90	3.20	3.37	2.86	2.20	1.17	0.56	-80.6%
Chile	0.61	0.37	0.27	0.09	0.58	1.13	1.96	3.33	1.30	0.64	0.41	-28.4%
Mexico	0.26	0.39	1.01	1.34	..	2.58	3.87	2.73	2.53	2.56	2.65	..
United States	23.58	33.88	90.10	55.82	91.60	91.43	89.80	82.58	83.47	46.17	40.96	-55.3%
OECD Americas	27.54	37.25	96.15	58.44	95.07	98.33	99.01	91.50	89.49	50.55	44.58	-53.1%
Australia	5.15	5.08	3.71	2.31	2.16	2.82	2.99	2.76	2.18	2.33	2.44	13.1%
Israel ¹	..	..	..	0.35	0.38	0.65	0.59	0.81	1.07	0.43	0.82	113.4%
Japan	50.44	64.91	39.38	24.24	17.90	18.15	17.14	20.02	14.98	11.44	13.88	-22.4%
Korea	1.54	0.17	0.31	1.71	5.32	21.57	30.77	33.58	29.04	27.33	30.37	470.6%
New Zealand	1.05	1.09	1.19	0.74	1.05	1.14	0.76	1.00	1.08	0.93	1.08	2.6%
OECD Asia Oceania	58.18	71.25	44.60	29.35	26.81	44.32	52.25	58.18	48.35	42.45	48.58	81.2%
Austria	-	-	-	-	0.05	0.06	0.07	0.08	0.07	0.06	0.05	6.2%
Belgium	8.16	8.76	7.63	7.41	13.04	12.43	17.19	24.64	24.54	17.34	18.64	43.0%
Czech Republic	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	2.11	1.69	1.34	1.36	3.05	5.01	4.08	2.43	2.19	2.34	2.42	-20.9%
Estonia	..	..	..	..	0.57	0.28	0.33	0.38	0.70	1.03	0.92	60.9%
Finland	0.24	0.31	1.86	1.47	1.80	1.05	2.12	1.61	0.67	0.31	0.94	-47.6%
France	12.89	14.71	12.72	7.65	7.86	6.78	8.99	8.25	7.41	5.84	5.22	-33.6%
Germany	13.13	10.71	11.22	11.05	7.95	6.57	6.98	7.93	8.84	7.32	7.61	-4.3%
Greece	1.90	2.82	2.66	3.54	8.11	11.34	11.45	9.15	8.73	6.00	5.73	-29.4%
Hungary	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	..	..	..	0.02	0.10	0.14	0.21	0.20	0.18	0.07	0.15	50.8%
Ireland	0.24	0.21	0.24	0.09	0.06	0.37	0.47	0.33	0.26	0.40	0.49	762.8%
Italy	23.10	18.22	13.29	10.93	8.52	7.75	5.30	7.23	9.59	6.17	6.12	-28.2%
Latvia	..	..	..	..	1.50	0.48	0.03	0.82	0.80	0.73	0.80	-46.3%
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	28.61	33.28	29.78	27.82	34.93	34.70	41.42	49.20	43.64	40.74	39.58	13.3%
Norway	1.94	1.52	0.88	1.04	1.41	2.22	2.59	2.18	1.22	0.46	0.60	-57.1%
Poland	1.65	2.23	2.24	1.65	1.25	0.44	0.91	1.02	0.69	0.46	0.58	-53.6%
Portugal	2.34	2.02	1.36	1.50	1.93	1.53	2.10	1.84	1.48	1.95	2.06	6.7%
Slovak Republic	-	-	-	-	-	-	-	-	-	-	-	-
Slovenia	..	..	..	..	..	..	..	0.07	0.06	0.18	0.20	..
Spain	6.00	3.47	5.12	6.83	11.57	10.10	19.16	25.25	26.79	24.88	23.77	105.4%
Sweden	3.62	3.48	2.69	1.77	2.11	3.33	4.33	6.18	6.25	5.47	5.75	172.1%
Switzerland	-	-	-	-	0.06	0.05	0.03	0.04	0.03	0.02	0.02	-66.7%
Turkey	0.27	0.29	..	0.25	0.38	0.58	1.26	3.34	1.16	3.20	2.69	616.7%
United Kingdom	17.54	10.70	7.65	6.63	7.92	7.70	6.50	6.41	8.75	8.84	7.60	-4.0%
OECD Europe ¹	123.75	114.43	100.68	91.01	114.16	112.91	135.54	158.59	154.03	133.82	131.95	15.6%
<i>IEA/Accession/Association</i>	222.74	238.38	262.09	199.39	277.47	304.98	358.80	410.88	454.52	389.30	402.94	45.2%
<i>European Union - 28</i>	..	..	..	..	113.13	111.68	134.68	156.72	157.49	135.24	134.83	19.2%
<i>G20</i>	..	..	..	..	267.06	293.02	332.75	371.41	404.05	365.39	377.71	41.4%
<i>Africa</i>	22.20	16.03	16.66	14.02	16.66	24.35	23.58	20.56	18.82	18.31	19.90	19.5%
<i>Americas</i>	58.43	61.59	117.67	78.41	114.94	123.19	132.42	130.31	137.04	95.99	89.71	-21.9%
<i>Asia</i>	..	..	..	..	110.69	156.90	192.95	245.94	326.94	316.14	347.85	214.3%
<i>Europe</i>	..	..	..	..	125.94	119.85	145.33	170.90	176.47	193.74	195.76	55.4%
<i>Oceania</i>	6.78	6.71	5.37	3.25	3.42	4.26	4.09	4.21	3.67	3.55	3.82	11.8%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from international marine bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	144.31	118.15	115.91	127.96	135.60	172.97	211.57	263.65	371.06	400.91	431.92	218.5%
Albania	..	..	..	..	..	..	..	..	..	0.06	0.06	..
Armenia	..	..	..	..	..	..	..	..	..	..	..	..
Azerbaijan	..	..	..	..	..	..	..	..	0.23	0.23	0.16	..
Belarus	..	..	..	..	..	..	..	..	..	..	..	..
Bosnia and Herzegovina	..	..	..	..	..	..	..	..	..	..	..	..
Bulgaria	..	..	..	0.72	0.18	0.85	0.20	0.35	0.31	0.26	0.27	49.6%
Croatia	..	..	..	..	0.15	0.10	0.06	0.08	0.02	..	..	-100.0%
Cyprus ¹	0.01	0.07	0.05	0.11	0.18	0.21	0.60	0.91	0.58	0.73	0.76	319.8%
FYR of Macedonia	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	..	..	..	..	..	0.16	..	..	..	..	..	..
Gibraltar	3.54	3.85	4.20	4.67	5.51	5.97	8.41	12.67	13.28	11.46	11.70	112.5%
Kazakhstan	..	..	..	..	..	..	..	..	..	..	0.30	..
Kosovo	..	..	..	..	..	..	..	..	..	..	..	..
Kyrgyzstan	..	..	..	..	..	..	..	..	..	..	..	..
Lithuania	..	..	..	..	0.30	0.45	0.29	0.46	0.45	0.03	0.24	-19.8%
Malta	0.19	0.08	0.09	0.06	0.09	0.14	2.09	2.11	4.65	3.90	4.93	+
Republic of Moldova	..	..	..	..	..	..	..	..	..	..	..	..
Montenegro	..	..	..	..	..	..	..	..	..	..	..	..
Romania	..	..	..	..	..	..	..	..	0.05	0.25	0.14	..
Russian Federation	..	..	..	..	5.93	..	..	..	4.84	47.11	49.08	728.2%
Serbia	..	..	..	..	..	..	..	..	..	0.05	0.08	..
Tajikistan	..	..	..	..	..	..	..	..	..	..	..	..
Turkmenistan	..	..	..	..	..	..	..	..	..	..	..	..
Ukraine	..	..	..	..	..	..	..	..	..	..	..	..
Uzbekistan	..	..	..	..	..	..	..	..	..	..	..	..
Former Soviet Union ¹	13.31	14.24	14.24	13.93	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	..	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	17.04	18.23	18.58	19.49	12.34	7.89	11.65	16.57	24.41	64.08	67.72	448.9%
Algeria	0.61	0.77	1.30	1.17	1.37	1.18	0.77	1.18	1.02	0.83	0.87	-36.8%
Angola	0.78	0.49	0.84	0.11	0.02	0.03	..	0.34	0.56	1.15	1.28	+
Benin	..	..	..	..	..	..	..	..	..	..	..	..
Botswana	..	..	..	..	..	..	..	..	..	..	..	..
Cameroon	..	..	0.12	0.03	0.04	0.09	0.06	0.04	0.14	0.17	0.18	322.1%
Congo	..	..	..	..	..	..	..	..	..	..	..	..
Côte d'Ivoire	0.06	0.01	1.36	0.73	0.12	0.27	0.29	0.36	0.06	0.15	0.23	89.3%
Dem. Rep. of the Congo	0.41	0.22	0.08	0.09	0.11	0.01	..	..	..	..	..	-100.0%
Egypt	0.06	1.11	3.27	4.83	5.38	7.92	8.78	4.63	1.40	0.52	0.58	-89.3%
Eritrea	..	..	..	..	..	0.43	..	..	..	..	..	..
Ethiopia	0.07	0.02	0.01	0.03	0.03	0.03	..	..	..	..	..	-100.0%
Gabon	0.20	0.14	0.20	0.23	0.08	0.44	0.61	0.61	0.66	0.55	0.58	622.8%
Ghana	0.16	0.14	0.10	..	..	..	0.16	0.12	0.13	..	..	..
Kenya	1.49	1.07	0.57	0.45	0.56	0.17	0.21	0.22	0.12	0.12	0.13	-76.5%
Libya	0.01	0.01	0.02	0.04	0.25	0.28	0.86	1.16	1.17	0.30	0.26	3.7%
Mauritius	0.05	0.11	0.17	0.22	0.19	0.27	0.69	0.60	0.74	0.91	0.89	368.4%
Morocco	0.24	0.18	0.21	0.04	0.06	0.04	0.05	0.07	0.43	0.43	0.43	568.8%
Mozambique	0.76	0.36	0.27	0.10	0.09	0.01	0.00	0.01	..	..	..	-100.0%
Namibia	..	..	..	..	..	..	..	..	..	..	..	..
Niger	..	..	..	..	..	..	..	..	..	..	..	..
Nigeria	0.02	0.11	0.25	0.35	0.59	1.43	1.21	1.29	1.32	1.18	1.18	100.7%
Senegal	3.02	2.11	0.85	0.33	0.11	0.09	0.30	0.36	0.21	0.23	0.24	112.2%
South Africa	10.92	7.22	5.31	3.44	6.01	10.41	8.60	8.60	9.82	10.45	11.72	95.0%
South Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Sudan	..	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.06	0.07	200.0%
United Rep. of Tanzania	0.05	0.05	0.12	0.08	0.08	0.07	0.08	0.11	0.14	0.19	0.20	149.7%
Togo	..	..	..	..	..	..	0.01	0.01	0.05	0.05	0.06	..
Tunisia	0.06	0.02	0.02	0.01	0.07	0.06	0.06	0.05	0.04	0.05	0.01	-86.0%
Zambia	..	..	..	..	..	..	..	..	..	..	..	..
Zimbabwe	..	..	..	..	..	..	..	..	..	..	..	..
Other Africa	3.23	1.88	1.58	1.72	1.47	1.10	0.79	0.76	0.77	0.98	1.00	-32.1%
Africa	22.20	16.03	16.66	14.02	16.66	24.35	23.58	20.56	18.82	18.31	19.90	19.5%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from international marine bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.07	0.05	0.19	0.07	0.06	0.11	0.14	0.18	0.25	0.31	0.33	430.9%
Brunei Darussalam	..	..	0.00	..	0.12	0.21	0.22	0.27	0.28	0.22	0.29	149.4%
Cambodia	..	..	..	..	..	..	..	..	..	..	..	..
DPR of Korea	..	..	..	..	..	..	..	..	..	..	..	..
India	0.72	0.58	0.73	0.34	1.38	1.71	2.19	3.09	4.17	4.24	4.41	220.9%
Indonesia	0.71	1.10	0.80	0.69	1.70	1.30	0.36	0.43	0.56	0.70	0.74	-56.6%
Malaysia	0.11	0.22	0.19	0.31	0.30	0.54	0.70	0.19	0.19	0.67	1.12	280.7%
Mongolia	..	..	..	-	-	-	-	-	-	-	-	-
Myanmar	0.01	0.00	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	x
Nepal	-	-	-	-	-	-	-	-	-	-	-	-
Pakistan	0.29	0.22	0.47	0.08	0.11	0.05	0.08	0.26	0.56	0.21	0.22	99.9%
Philippines	1.31	0.45	0.59	0.50	0.21	0.36	0.68	0.38	0.59	0.29	0.09	-59.1%
Singapore	8.98	10.53	15.11	15.29	34.21	35.63	58.16	79.39	127.21	132.05	140.61	311.0%
Sri Lanka	1.20	1.30	1.12	1.02	1.22	1.10	0.51	0.54	0.66	1.36	1.30	6.4%
Chinese Taipei	0.39	0.33	0.67	1.64	4.90	7.63	11.11	7.56	5.50	3.63	3.40	-30.7%
Thailand	0.21	0.26	0.51	0.66	1.72	3.05	2.49	5.23	4.46	3.33	3.77	119.7%
Viet Nam	..	..	..	0.07	0.09	0.22	0.46	0.80	1.03	0.60	0.52	503.7%
Other non-OECD Asia	0.57	0.54	0.47	0.20	0.21	0.30	0.33	0.44	0.41	0.67	0.64	202.8%
Asia (excl. China)	14.56	15.58	20.83	20.87	46.21	52.22	77.45	98.78	145.88	148.29	157.44	240.7%
People's Rep. of China	2.41	2.82	3.32	3.95	4.34	8.95	9.57	16.30	27.90	23.14	29.83	587.9%
Hong Kong, China	2.00	1.72	2.88	3.14	4.57	7.24	10.72	17.97	38.98	24.17	27.46	501.2%
China	4.40	4.53	6.20	7.09	8.90	16.19	20.29	34.28	66.88	47.32	57.29	543.4%
Argentina	0.66	0.29	1.34	2.02	2.24	1.72	1.50	2.22	3.80	4.99	2.93	30.3%
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	1.01	1.18	1.43	1.73	1.73	3.67	9.25	11.03	12.74	11.12	13.27	665.6%
Colombia	0.96	0.49	0.31	0.22	0.33	0.58	0.75	1.15	2.04	2.81	2.58	677.9%
Costa Rica	0.10	..	0.13	0.14	0.24	0.37	0.34	0.36	0.09	0.00	0.00	-98.7%
Cuba	..	..	..	0.12	0.06	0.04	0.05	0.06	2.41	2.29	2.32	+
Curacao ¹	7.79	7.41	7.35	6.19	5.23	5.37	6.35	6.78	7.26	5.09	5.00	-4.3%
Dominican Republic	..	..	..	..	..	..	..	..	..	..	..	..
Ecuador	0.28	..	0.35	0.12	0.50	1.00	0.88	2.10	1.72	1.40	1.09	118.0%
El Salvador	..	..	..	..	..	..	..	..	..	..	..	..
Guatemala	0.18	0.27	0.41	0.38	0.43	0.53	0.64	0.75	0.90	1.04	1.08	152.2%
Haiti	..	..	..	..	..	..	..	..	..	..	..	..
Honduras	..	..	..	..	..	..	..	..	0.00	..	0.02	..
Jamaica	0.16	0.27	0.10	0.04	0.10	0.12	0.12	0.26	0.27	0.63	0.63	522.5%
Nicaragua	..	..	..	..	..	..	..	..	..	..	..	..
Panama	1.72	3.44	3.13	4.07	5.00	6.49	8.15	7.37	9.56	9.96	10.17	103.4%
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-
Peru	0.10	0.13	0.48	0.63	0.12	0.53	0.31	1.01	0.77	0.00	..	-100.0%
Suriname	..	..	..	..	..	..	0.07	0.11	0.13	0.15	0.16	..
Trinidad and Tobago	5.17	3.58	1.44	0.31	0.11	0.16	1.21	1.49	1.07	1.44	1.71	+
Uruguay	0.28	0.20	0.25	0.33	0.37	1.22	0.93	1.14	1.43	0.68	0.52	38.4%
Venezuela	9.22	4.87	2.01	1.78	2.53	2.32	2.08	2.35	2.77	2.94	2.75	8.9%
Other non-OECD Americas	3.25	2.21	2.82	1.88	0.87	0.72	0.80	0.64	0.59	0.89	0.91	4.0%
Non-OECD Americas	30.89	24.34	21.53	19.97	19.87	24.85	33.42	38.81	47.54	45.44	45.13	127.2%
Bahrain	0.56	0.56	0.61	0.48	0.25	0.26	0.25	0.24	0.25	0.26	0.26	3.7%
Islamic Republic of Iran	1.05	1.28	1.26	0.93	1.27	1.90	2.26	2.95	7.38	11.47	15.05	+
Iraq	0.26	0.30	0.37	0.47	0.40	0.02	0.49	0.33	0.44	0.58	0.70	72.3%
Jordan	..	..	..	..	..	0.03	0.13	0.25	0.05	0.01	0.02	..
Kuwait	6.36	6.38	5.66	2.40	0.56	1.84	1.44	2.17	1.70	3.57	4.35	677.9%
Lebanon	0.72	0.03	..	..	..	0.04	0.05	0.06	0.09	0.10	0.10	..
Oman	3.89	2.57	0.72	0.35	0.06	0.08	0.20	0.12	3.62	3.67	4.01	+
Qatar	..	..	..	..	..	..	..	..	..	..	..	..
Saudi Arabia	40.46	26.13	13.76	28.30	5.79	6.02	6.67	7.16	8.18	10.03	9.89	70.6%
Syrian Arab Republic	0.78	1.27	1.99	2.56	2.85	3.47	3.71	3.20	3.46	0.78	0.55	-80.5%
United Arab Emirates	..	..	5.59	9.78	19.19	33.50	29.68	37.81	42.01	46.73	49.32	157.1%
Yemen	1.14	0.92	2.16	1.25	1.25	0.31	0.31	0.36	0.34	0.28	0.20	-83.7%
Middle East	55.22	39.43	32.11	46.52	31.62	47.46	45.18	54.66	67.53	77.47	84.45	167.0%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from international aviation bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World	169.22	173.87	202.13	224.90	258.94	290.34	355.82	422.78	457.66	504.49	529.69	104.6%
<i>Annex I Parties</i>	..	..	..	..	171.24	181.74	226.55	257.14	254.64	266.86	276.30	61.3%
<i>Annex II Parties</i>	59.17	62.37	71.49	82.30	132.44	161.20	206.43	231.69	225.18	234.91	243.01	83.5%
North America	16.77	17.70	21.39	22.05	41.92	49.03	60.81	71.41	68.72	69.65	73.18	74.6%
Europe	36.32	38.05	43.13	49.09	71.41	87.98	116.82	128.31	127.38	131.85	136.34	90.9%
Asia Oceania	6.07	6.61	6.96	11.16	19.12	24.20	28.80	31.97	29.08	33.41	33.49	75.2%
<i>Annex I EIT</i>	..	..	..	..	37.32	18.73	17.37	21.04	24.69	23.10	21.55	-42.2%
<i>Non-Annex I Parties</i>	..	..	..	..	87.70	108.60	129.27	165.64	203.02	237.63	253.39	188.9%
<i>Annex B Kyoto Parties</i>	..	..	..	..	90.08	100.19	129.44	143.73	145.35	151.45	156.39	73.6%
Non-OECD Total	104.93	105.00	120.73	131.85	115.44	114.44	132.22	164.41	200.89	230.94	244.07	111.4%
OECD Total	64.29	68.87	81.40	93.05	143.50	175.90	223.59	258.37	256.78	273.55	285.62	99.0%
Canada	1.27	1.95	1.36	1.23	2.73	2.61	3.12	2.51	3.41	2.46	2.59	-5.4%
Chile	0.44	0.35	0.55	0.50	0.57	0.65	1.06	1.07	1.54	1.96	1.70	197.2%
Mexico	1.40	2.42	4.28	4.58	5.29	6.83	8.13	8.60	8.16	9.71	10.33	95.4%
United States	15.51	15.76	20.03	20.82	39.19	46.42	57.69	68.90	65.31	67.19	70.59	80.1%
OECD Americas	18.62	20.48	26.22	27.12	47.77	56.50	70.00	81.07	78.42	81.33	85.20	78.3%
Australia	1.59	1.91	2.43	2.79	4.34	5.80	7.22	8.16	10.19	11.72	11.65	168.5%
Israel ¹	1.81	1.90	2.23	2.01	1.60	2.15	2.40	3.24	2.43	2.55	2.76	72.7%
Japan	3.83	4.36	3.96	7.71	13.45	16.78	19.77	21.58	16.55	19.17	19.33	43.8%
Korea	-	0.37	0.83	1.71	0.85	2.07	1.71	7.32	12.01	12.83	13.19	+
New Zealand	0.65	0.34	0.58	0.66	1.33	1.61	1.81	2.23	2.33	2.52	2.52	88.8%
OECD Asia Oceania	7.88	8.88	10.03	14.89	21.57	28.41	32.92	42.53	43.52	48.79	49.45	129.3%
Austria	0.28	0.25	0.39	0.65	0.86	1.29	1.65	1.91	2.00	1.93	2.08	140.6%
Belgium	1.23	1.06	1.24	1.64	2.84	2.63	4.42	3.83	4.12	3.98	4.35	52.9%
Czech Republic	0.70	0.59	0.86	0.64	0.66	0.57	0.48	0.95	0.93	0.87	0.88	33.1%
Denmark	1.94	1.57	1.61	1.57	1.72	1.85	2.34	2.58	2.42	2.67	2.61	51.8%
Estonia	..	..	..	..	0.10	0.05	0.06	0.14	0.11	0.12	0.07	-29.4%
Finland	0.18	0.40	0.46	0.49	0.98	0.87	1.03	1.25	1.60	1.86	1.90	93.4%
France	4.62	5.77	5.67	6.50	9.42	11.56	15.22	16.27	16.49	16.86	17.78	88.8%
Germany	7.65	8.24	8.30	9.55	13.31	15.64	19.33	22.39	23.90	24.06	24.09	81.0%
Greece	1.31	1.33	2.25	2.36	2.36	2.55	2.44	2.33	2.04	2.33	2.47	4.3%
Hungary	0.15	0.21	0.37	0.45	0.49	0.54	0.70	0.80	0.70	0.53	0.54	9.4%
Iceland	0.22	0.14	0.09	0.18	0.22	0.20	0.40	0.40	0.37	0.54	0.66	201.4%
Ireland	0.97	0.74	0.61	0.57	1.04	1.12	1.74	2.38	2.16	2.16	2.45	134.8%
Italy	3.50	2.46	4.19	4.38	4.54	5.86	8.46	8.97	9.48	9.21	9.48	108.7%
Latvia	..	..	..	..	0.22	0.08	0.08	0.18	0.35	0.33	0.32	46.5%
Luxembourg	0.11	0.15	0.19	0.22	0.39	0.57	0.96	1.29	1.29	1.21	1.37	247.7%
Netherlands	2.03	2.29	2.75	3.50	4.55	7.52	9.77	10.79	10.09	10.70	11.32	148.7%
Norway	0.70	0.51	0.68	0.93	1.26	1.10	1.06	1.05	1.29	1.51	1.48	18.1%
Poland	0.53	0.53	0.68	0.68	0.66	0.81	0.82	0.96	1.52	1.75	1.94	194.0%
Portugal	0.71	0.81	0.89	1.28	1.38	1.56	1.94	2.18	2.63	2.89	3.13	127.5%
Slovak Republic	-	-	-	-	-	0.12	0.08	0.12	0.12	0.10	0.13	x
Slovenia	..	..	..	..	0.08	0.06	0.07	0.07	0.08	0.08	0.08	-3.8%
Spain	1.76	2.80	2.60	2.69	3.35	6.07	8.11	9.28	9.11	10.93	11.55	244.5%
Sweden	0.33	0.34	0.49	0.51	1.09	1.77	2.08	1.89	2.06	2.16	2.21	104.0%
Switzerland	1.64	1.81	2.04	2.44	3.03	3.66	4.61	3.52	4.20	4.70	4.86	60.2%
Turkey	0.09	0.14	0.12	0.18	0.54	0.79	1.56	3.25	3.64	7.81	10.67	+
United Kingdom	7.15	7.39	8.68	9.63	19.05	22.14	31.24	36.01	32.13	32.13	32.55	70.9%
OECD Europe ¹	37.79	39.51	45.16	51.03	74.16	90.99	120.68	134.76	134.84	143.43	150.97	103.6%
<i>IEA/Accession/Association</i>	66.45	73.13	88.36	102.68	159.52	197.68	252.37	298.49	311.45	341.37	357.95	124.4%
<i>European Union - 28</i>	..	..	..	..	72.35	88.16	115.12	128.99	127.85	131.55	136.08	88.1%
G20	..	..	..	..	184.43	211.95	260.19	311.76	327.45	353.97	369.79	100.5%
<i>Africa</i>	5.44	7.76	10.82	11.40	11.75	13.60	17.91	17.91	20.32	21.92	21.76	85.1%
<i>Americas</i>	23.24	25.68	33.78	34.62	56.51	68.87	86.08	99.89	101.20	109.10	112.56	99.2%
<i>Asia</i>	..	..	..	..	74.80	92.85	107.24	143.72	170.04	203.09	222.09	196.9%
<i>Europe</i>	..	..	..	..	109.71	107.29	134.96	150.07	152.71	155.72	158.67	44.6%
<i>Oceania</i>	2.62	2.51	3.29	3.89	6.17	7.73	9.63	11.19	13.39	14.66	14.60	136.7%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from international aviation bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	104.93	105.00	120.73	131.85	115.44	114.44	132.22	164.41	200.89	230.94	244.07	111.4%
Albania	-	-	-	-	-	-	0.12	0.18	0.05	0.02	0.01	x
Armenia	..	..	..	..	0.60	0.10	0.19	0.14	0.13	0.13	0.10	-84.0%
Azerbaijan	..	..	..	..	1.05	0.31	0.30	1.11	1.21	1.07	0.81	-22.1%
Belarus	..	..	..	..	-	-	-	-	-	0.34	0.34	x
Bosnia and Herzegovina	..	..	..	..	0.08	0.11	0.03	0.02	0.02	0.01	0.02	-76.0%
Bulgaria	0.61	0.61	0.92	1.13	0.71	0.99	0.24	0.56	0.50	0.51	0.53	-25.9%
Croatia	..	..	..	..	0.49	0.24	0.20	0.25	0.29	0.35	0.34	-29.7%
Cyprus ¹	0.15	0.02	0.23	0.44	0.73	0.80	0.82	0.89	0.83	0.71	0.72	-1.3%
FYR of Macedonia	..	..	..	..	0.02	0.09	0.09	0.02	0.02	0.04	0.04	180.0%
Georgia	..	..	..	..	0.61	0.01	0.05	0.11	0.12	0.25	0.21	-65.0%
Gibraltar	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	14.3%
Kazakhstan	..	..	..	..	2.70	0.79	0.23	0.49	0.62	0.69	0.95	-65.0%
Kosovo	..	..	..	..	..	..	-	-	0.04	0.01	0.01	..
Kyrgyzstan	..	..	..	..	0.26	0.19	0.12	0.39	0.83	0.01	0.32	20.0%
Lithuania	..	..	..	..	0.40	0.12	0.07	0.14	0.14	0.23	0.24	-39.7%
Malta	0.18	0.18	0.23	0.14	0.22	0.22	0.37	0.26	0.30	0.33	0.34	60.0%
Republic of Moldova	..	..	..	..	0.22	0.03	0.06	0.04	0.06	0.08	0.07	-66.7%
Montenegro	..	..	..	..	..	..	..	0.04	0.01	0.05	0.06	..
Romania	0.06	0.05	-	-	0.70	0.55	0.38	0.33	0.43	0.55	0.60	-13.7%
Russian Federation	..	..	..	..	26.63	14.13	13.40	15.43	18.67	16.95	15.17	-43.1%
Serbia	..	..	..	..	0.43	0.11	0.09	0.15	0.13	0.21	0.19	-55.7%
Tajikistan	..	..	..	..	0.05	0.02	0.01	0.03	0.09	0.19	0.17	260.0%
Turkmenistan	..	..	..	..	0.76	0.62	0.98	1.35	1.63	1.45	1.45	90.3%
Ukraine	..	..	..	..	6.18	0.48	0.78	1.12	0.83	0.40	0.37	-93.9%
Uzbekistan	..	..	..	..	-	-	-	-	-	-	-	-
Former Soviet Union ¹	67.33	62.72	71.33	77.48	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	0.65	0.89	1.01	1.00	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	69.00	64.50	73.74	80.20	42.83	19.93	18.55	23.07	26.96	24.58	23.08	-46.1%
Algeria	0.29	0.67	0.94	1.32	1.10	0.97	1.18	1.17	1.44	1.32	1.45	31.6%
Angola	0.23	0.31	0.26	1.00	1.04	1.18	1.43	0.57	0.64	0.72	0.68	-34.7%
Benin	0.02	0.01	0.03	0.06	0.05	0.07	0.07	0.03	0.47	-	-	-100.0%
Botswana	..	..	..	0.01	0.04	0.02	0.02	0.03	0.04	0.03	0.04	18.2%
Cameroon	0.17	0.10	0.15	0.15	0.15	0.17	0.18	0.20	0.21	0.25	0.27	75.0%
Congo	-	0.05	0.11	0.09	0.08	0.05	0.08	0.11	0.14	0.13	0.13	75.0%
Côte d'Ivoire	0.13	0.21	0.26	0.29	0.27	0.26	0.37	0.28	0.18	0.21	0.40	48.8%
Dem. Rep. of the Congo	0.28	0.25	0.38	0.40	0.32	0.35	0.24	0.51	0.47	0.72	0.39	19.8%
Egypt	0.21	0.28	0.52	0.13	0.46	0.82	1.77	2.31	2.64	2.17	1.65	261.4%
Eritrea	..	..	..	..	..	0.02	0.03	0.03	0.00	0.00	0.00	..
Ethiopia	0.14	0.16	0.20	0.34	0.54	0.17	0.21	0.40	0.87	1.25	1.31	144.7%
Gabon	0.03	0.04	0.07	0.09	0.20	0.20	0.24	0.21	0.25	0.21	0.20	3.0%
Ghana	0.13	0.15	0.12	0.10	0.14	0.18	0.33	0.40	0.36	0.39	0.38	172.8%
Kenya	0.58	0.90	1.11	0.83	0.84	1.38	1.38	1.78	1.72	1.69	2.02	141.4%
Libya	0.27	0.54	0.90	1.06	0.64	0.92	1.34	0.52	0.62	0.38	0.20	-68.5%
Mauritius	0.06	0.10	0.14	0.18	0.21	0.21	0.61	0.73	0.73	0.76	0.82	283.6%
Morocco	0.35	0.44	0.78	0.70	0.79	0.74	0.91	1.17	1.79	2.01	2.01	152.6%
Mozambique	0.12	0.05	0.08	0.10	0.13	0.06	0.13	0.14	0.20	0.38	0.11	-17.1%
Namibia	..	..	..	..	..	0.10	0.13	0.03	0.12	0.15	0.16	..
Niger	..	..	..	..	..	..	0.05	0.04	0.04	0.10	0.13	..
Nigeria	0.25	0.71	1.15	1.35	0.96	1.26	0.59	0.71	0.52	0.96	1.08	12.3%
Senegal	0.30	0.37	0.59	0.43	0.46	0.46	0.76	0.75	0.69	0.82	0.87	90.3%
South Africa	0.53	0.74	0.88	0.94	1.11	1.59	2.82	2.18	2.43	2.47	2.73	146.7%
South Sudan	..	..	..	..	..	..	..	..	..	0.12	0.08	..
Sudan	0.34	0.15	0.20	0.22	0.10	0.11	0.33	0.98	0.85	0.78	0.80	734.2%
United Rep. of Tanzania	0.09	0.20	0.18	0.13	0.22	0.19	0.18	0.26	0.34	0.44	0.47	111.7%
Togo	-	-	-	-	0.11	0.12	0.04	0.15	0.22	0.25	0.26	148.5%
Tunisia	0.39	0.38	0.57	0.31	0.57	0.75	0.86	0.66	0.76	0.82	0.63	9.6%
Zambia	0.04	0.14	0.23	0.12	0.20	0.10	0.13	0.17	0.09	0.12	0.12	-39.7%
Zimbabwe	0.09	0.19	0.21	0.33	0.25	0.35	0.36	0.03	0.03	0.03	0.08	-68.4%
Other Africa	0.40	0.64	0.74	0.72	0.79	0.81	1.17	1.36	1.48	2.24	2.29	189.4%
Africa	5.44	7.76	10.82	11.40	11.75	13.60	17.91	17.91	20.32	21.92	21.76	85.1%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions from international aviation bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.06	0.09	0.15	0.22	0.27	0.30	0.38	0.81	0.92	1.03	1.08	294.2%
Brunei Darussalam	0.00	0.06	0.07	0.05	0.11	0.21	0.21	0.25	0.33	0.23	0.26	127.8%
Cambodia	..	..	..	..	..	0.03	0.04	0.06	0.13	0.26	0.28	..
DPR of Korea	-	-	-	-	-	-	-	-	-	-	-	..
India	1.69	2.00	2.51	3.24	3.74	4.65	5.02	7.36	11.34	12.45	13.98	273.3%
Indonesia	0.17	0.33	0.73	0.66	0.97	1.18	1.22	1.54	2.04	2.54	2.66	173.8%
Malaysia	0.42	0.75	0.76	0.86	1.51	2.78	3.77	4.81	5.70	7.56	7.51	397.7%
Mongolia	..	..	..	-	0.01	0.06	0.06	0.06	0.05	0.08	0.09	575.0%
Myanmar	0.03	0.02	0.03	0.03	0.02	0.02	0.05	0.03	0.06	0.13	0.14	616.6%
Nepal	0.01	0.02	0.04	0.06	0.05	0.11	0.17	0.19	0.26	0.36	0.31	520.0%
Pakistan	1.14	1.09	1.71	1.42	1.41	1.72	1.98	2.46	2.28	2.04	2.13	51.4%
Philippines	0.71	0.83	0.66	1.03	1.02	1.17	1.43	2.14	2.96	3.11	3.64	258.1%
Singapore	0.70	1.33	2.73	3.23	5.69	7.89	12.01	13.59	17.19	21.60	22.09	288.3%
Sri Lanka	-	0.00	0.00	-	-	-	0.32	0.94	0.35	1.44	1.17	x
Chinese Taipei	1.49	1.64	1.67	0.92	1.81	4.13	5.42	6.51	6.30	7.65	8.14	349.6%
Thailand	1.27	2.19	2.41	3.16	5.64	7.59	8.35	10.27	10.00	11.25	12.07	114.0%
Viet Nam	6.98	2.63	-	-	-	0.12	0.30	0.95	2.03	2.17	2.90	x
Other non-OECD Asia	0.40	0.28	0.33	0.47	0.52	0.33	0.62	0.84	0.91	1.10	1.05	101.2%
Asia (excl. China)	15.07	13.26	13.83	15.35	22.78	32.29	41.35	52.81	62.84	75.00	79.49	248.9%
People's Rep. of China	-	-	0.10	0.85	1.30	2.22	4.22	10.07	15.56	21.47	23.35	+
Hong Kong, China	1.43	1.85	2.27	2.58	5.68	9.31	8.39	14.86	16.35	18.22	19.17	237.6%
China	1.43	1.85	2.37	3.43	6.98	11.53	12.61	24.93	31.91	39.68	42.52	508.9%
Argentina	-	-	-	-	-	1.59	2.86	2.17	1.87	2.65	2.62	x
Bolivia	-	-	-	-	-	-	0.14	0.15	0.14	0.19	0.22	x
Brazil	-	-	0.61	0.75	1.43	2.08	2.02	3.34	5.83	7.45	7.28	409.9%
Colombia	0.60	0.93	1.32	1.32	1.58	2.17	1.91	1.85	2.36	3.26	2.21	40.1%
Costa Rica	-	-	-	-	0.01	0.32	0.37	0.57	0.50	0.49	0.53	+
Cuba	0.27	0.44	0.66	0.90	0.99	0.54	0.65	0.54	0.44	0.38	0.35	-64.6%
Curaçao ¹	0.16	0.13	0.17	0.13	0.12	0.20	0.24	0.26	0.28	0.19	0.19	62.1%
Dominican Republic	0.08	0.10	0.17	0.17	0.11	0.18	1.36	1.33	1.30	1.51	1.51	+
Ecuador	0.27	0.14	0.45	0.45	0.39	0.55	0.49	0.97	1.04	1.16	1.16	195.9%
El Salvador	0.04	0.05	0.06	0.11	0.11	0.16	0.22	0.24	0.34	0.48	0.48	319.4%
Guatemala	0.15	0.11	0.13	0.12	0.13	0.14	0.15	0.23	0.20	0.06	0.19	46.5%
Haiti	0.02	0.03	0.05	0.04	0.07	0.07	0.09	0.07	0.06	0.11	0.07	-4.3%
Honduras	0.02	0.03	0.06	0.12	0.09	0.07	0.11	0.07	0.15	0.21	0.25	169.0%
Jamaica	0.42	0.33	0.30	0.40	0.47	0.53	0.54	0.61	0.59	0.59	0.59	25.9%
Nicaragua	0.05	0.06	0.06	0.04	0.08	0.06	0.08	0.05	0.06	0.07	0.08	-3.7%
Panama	0.44	1.12	0.42	0.26	0.20	0.32	0.55	0.57	1.08	1.89	2.04	901.6%
Paraguay	0.03	0.04	0.06	0.06	0.03	0.03	0.04	0.05	0.07	0.11	0.10	222.0%
Peru	0.52	0.75	0.92	0.72	0.65	1.11	1.07	0.97	1.95	2.47	2.61	300.5%
Suriname	..	..	..	..	..	..	-	-	-	-	-	..
Trinidad and Tobago	0.21	0.12	0.17	0.22	0.20	0.18	0.33	1.21	0.85	0.68	0.76	285.5%
Uruguay	-	-	-	-	-	-	0.12	0.12	0.23	0.24	0.29	x
Venezuela	0.33	0.32	1.03	0.81	1.03	1.01	0.95	2.05	1.90	1.95	2.18	111.1%
Other non-OECD Americas	1.01	0.50	0.91	0.87	1.03	1.07	1.81	1.40	1.53	1.62	1.65	60.6%
Non-OECD Americas	4.63	5.20	7.56	7.50	8.73	12.37	16.08	18.81	22.78	27.78	27.36	213.3%
Bahrain	0.43	0.85	1.55	1.22	1.44	1.16	1.13	1.74	1.97	1.23	1.36	-5.7%
Islamic Republic of Iran	7.10	7.08	2.17	1.66	1.50	1.99	2.73	2.71	3.84	3.98	4.15	176.8%
Iraq	0.24	0.82	1.06	0.59	0.99	1.28	1.64	2.00	2.52	1.68	1.68	69.5%
Jordan	0.12	0.18	0.57	0.62	0.67	0.76	0.75	0.98	1.09	1.02	0.91	35.3%
Kuwait	0.35	0.35	1.06	0.98	0.52	1.14	1.16	1.84	2.26	2.26	2.20	326.0%
Lebanon	0.29	0.24	0.15	0.32	0.16	0.66	0.40	0.47	0.71	0.73	0.74	364.0%
Oman	0.01	0.15	0.38	0.58	0.94	0.47	0.65	0.69	1.30	1.62	1.61	70.6%
Qatar	-	0.16	0.23	0.24	0.35	0.43	0.57	1.45	3.61	4.00	3.86	+
Saudi Arabia	0.48	1.42	3.49	4.61	4.84	5.74	5.91	5.50	6.23	7.32	8.41	73.8%
Syrian Arab Republic	0.24	0.66	0.72	0.88	0.88	0.63	0.42	0.33	0.10	0.05	0.05	-94.2%
United Arab Emirates	0.02	0.34	0.81	1.82	9.89	10.19	9.97	8.81	12.07	17.87	24.85	151.3%
Yemen	0.09	0.18	0.22	0.47	0.18	0.28	0.38	0.36	0.37	0.22	0.04	-78.2%
Middle East	9.36	12.43	12.42	13.98	22.36	24.72	25.72	26.87	36.06	41.98	49.86	123.0%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions by sector in 2015 ¹million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use ²	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
World ³	32 294.2	13 540.6	1 654.8	6 066.1	7 737.8	5 792.0	3 294.8	1 865.9
<i>Annex I Parties</i>	12 406.5	5 067.6	719.3	1 430.0	3 507.6	3 030.7	1 682.0	982.9
<i>Annex II Parties</i>	9 741.7	3 705.6	603.0	1 078.4	3 031.0	2 659.8	1 323.6	734.2
<i>North America</i>	5 546.7	2 087.4	368.9	493.0	1 925.8	1 632.8	671.7	354.5
<i>Europe</i>	2 641.3	862.3	148.9	333.4	788.3	747.4	508.4	317.5
<i>Asia Oceania</i>	1 553.7	755.9	85.2	252.0	316.9	279.6	143.5	62.2
<i>Annex I EIT</i>	2 340.1	1 234.6	102.0	306.1	401.7	301.6	295.6	218.1
<i>Non-Annex I Parties</i>	18 700.9	8 473.1	935.5	4 636.1	3 043.5	2 761.3	1 612.8	882.9
<i>Annex B Kyoto Parties</i>	4 126.0	1 566.3	264.3	548.4	1 061.4	993.9	685.6	429.5
Non-OECD Total	19 387.3	8 949.9	918.0	4 722.6	3 065.7	2 697.8	1 731.1	997.4
OECD Total	11 720.2	4 590.7	736.8	1 343.6	3 485.4	3 094.1	1 563.7	868.5
Canada	549.2	102.9	117.3	62.1	173.8	140.0	93.1	40.4
Chile	81.6	33.0	2.3	15.4	25.2	22.6	5.6	3.1
Mexico	442.3	143.0	50.5	66.0	150.5	145.9	32.3	17.7
United States	4 997.5	1 984.5	251.6	430.9	1 752.0	1 492.8	578.6	314.1
OECD Americas	6 070.7	2 263.5	421.7	574.4	2 101.5	1 801.4	709.6	375.3
Australia	380.9	190.5	32.7	41.9	94.7	79.7	21.1	9.2
Israel ⁴	62.3	39.0	2.2	2.5	16.9	16.8	1.6	0.3
Japan	1 141.6	560.0	50.9	203.6	207.8	187.0	119.3	52.4
Korea	586.0	305.6	45.6	80.6	97.1	92.3	57.1	30.9
New Zealand	31.2	5.5	1.7	6.5	14.4	13.0	3.2	0.6
OECD Asia Oceania	2 201.9	1 100.5	133.1	335.2	430.9	388.8	202.3	93.4
Austria	62.1	13.7	6.5	10.9	22.7	21.9	8.3	5.7
Belgium	92.5	17.4	5.9	18.4	26.3	25.5	24.4	16.1
Czech Republic	99.6	54.2	4.3	11.9	17.3	16.8	11.8	7.8
Denmark	32.0	10.5	2.2	3.4	11.5	10.7	4.3	2.1
Estonia	15.5	11.7	0.1	0.6	2.3	2.2	0.8	0.2
Finland	42.1	16.8	3.3	7.2	10.9	10.2	3.9	1.1
France	290.5	32.6	16.7	40.6	122.4	118.0	78.1	43.4
Germany	729.8	322.8	23.6	93.9	157.5	152.4	131.8	84.7
Greece	64.6	30.5	4.1	6.3	16.7	14.4	7.0	5.4
Hungary	42.5	11.8	1.2	6.3	11.9	11.7	11.2	6.7
Iceland	2.1	0.0	-	0.5	0.8	0.8	0.7	0.0
Ireland	35.3	11.7	0.4	3.9	11.1	10.7	8.2	6.0
Italy	330.7	108.9	12.0	36.0	103.0	97.4	70.9	46.7
Latvia	6.8	1.9	-	0.8	3.1	2.8	1.2	0.4
Luxembourg	8.8	0.5	-	1.0	5.8	5.7	1.6	1.1
Netherlands	156.0	62.6	10.4	22.0	30.1	28.8	30.9	16.1
Norway	36.7	2.1	12.3	5.6	14.3	10.9	2.5	0.3
Poland	282.4	150.0	8.1	27.4	46.4	45.3	50.6	33.7
Portugal	47.0	19.0	2.7	5.6	15.8	15.1	4.0	1.8
Slovak Republic	29.4	6.7	5.0	7.1	6.0	5.6	4.6	2.6
Slovenia	12.8	4.6	0.0	1.6	5.3	5.2	1.3	0.7
Spain	247.0	81.4	18.8	28.9	85.5	78.3	32.4	16.2
Sweden	37.1	6.2	2.8	6.9	19.7	19.1	1.5	0.2
Switzerland	37.3	2.6	0.4	5.1	16.2	15.9	13.0	8.5
Turkey	317.2	123.6	14.3	44.9	72.5	66.9	62.0	30.2
United Kingdom	389.8	122.9	26.7	37.2	118.1	111.7	84.8	62.2
OECD Europe ⁴	3 447.6	1 226.8	182.0	434.0	953.0	904.0	651.9	399.8
<i>IEA/Accession/Association</i>	23 531.8	10 313.1	1 157.0	4 805.2	4 766.1	4 192.9	2 490.4	1 343.1
<i>European Union - 28</i>	3 201.2	1 164.5	162.3	398.0	886.9	845.7	589.5	370.2
<i>G20</i>	26 278.7	11 684.7	1 308.4	5 207.2	5 342.5	4 657.9	2 736.0	1 523.3
<i>Africa</i>	1 140.4	484.2	83.3	143.1	313.5	300.0	116.2	72.4
<i>Americas</i>	7 203.2	2 544.4	514.3	789.3	2 522.7	2 193.1	832.5	437.7
<i>Asia</i>	17 258.6	8 149.1	770.4	4 434.4	2 394.1	2 136.6	1 510.6	807.0
<i>Europe</i>	5 080.0	2 160.0	252.4	649.1	1 207.9	1 066.6	810.5	538.6
<i>Oceania</i>	425.4	202.9	34.4	50.2	112.8	95.7	25.1	10.1

1. This table shows CO₂ emissions for the same sectors which are present throughout this publication. In particular, the emissions from electricity and heat production are shown separately and not reallocated. 2. Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. 3. World includes international bunkers in the transport sector. 4. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions by sector in 2015million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
Non-OECD Total	19 387.3	8 949.9	918.0	4 722.6	3 065.7	2 697.8	1 731.1	997.4
Albania	3.8	-	0.1	0.7	2.4	2.3	0.6	0.2
Armenia	4.7	1.3	-	0.4	1.5	1.5	1.5	0.8
Azerbaijan	30.8	12.5	1.9	2.3	7.0	6.3	7.1	5.5
Belarus	53.2	27.5	3.6	4.5	10.5	8.8	7.1	4.2
Bosnia and Herzegovina	22.2	14.8	0.7	2.2	3.1	3.1	1.4	0.6
Bulgaria	43.8	28.3	1.2	3.7	9.0	8.6	1.6	0.7
Croatia	15.5	3.3	1.5	2.2	5.8	5.6	2.7	1.5
Cyprus ¹	5.9	2.9	-	0.6	1.8	1.8	0.6	0.3
FYR of Macedonia	7.2	4.0	0.0	1.1	1.8	1.8	0.3	0.0
Georgia	8.4	1.3	0.0	1.6	3.6	3.6	1.9	1.4
Gibraltar	0.6	0.2	-	-	0.4	0.4	-	-
Kazakhstan	225.1	87.0	48.7	50.9	14.8	13.3	23.7	14.5
Kosovo	8.6	6.4	-	0.7	1.1	1.1	0.4	0.1
Kyrgyzstan	9.9	2.9	0.1	1.8	2.7	2.7	2.4	1.7
Lithuania	10.5	1.7	1.6	1.2	5.1	4.8	1.1	0.6
Malta	1.6	0.8	-	0.0	0.6	0.5	0.2	0.0
Republic of Moldova	7.6	3.6	-	0.8	1.9	1.9	1.3	0.8
Montenegro	2.4	1.6	-	0.2	0.6	0.5	0.1	0.0
Romania	69.5	28.9	3.1	12.4	15.4	14.8	9.8	6.2
Russian Federation	1 469.0	811.9	68.0	184.6	240.6	150.4	164.0	130.2
Serbia	44.5	31.7	0.7	4.0	5.8	5.8	2.3	1.2
Tajikistan	4.3	0.3	0.0	0.0	2.3	2.3	1.7	-
Turkmenistan	69.1	20.7	5.2	2.4	11.8	7.9	29.0	0.5
Ukraine	189.4	92.1	4.4	41.9	23.1	18.9	28.0	22.6
Uzbekistan	95.6	40.0	2.9	12.6	6.4	3.6	33.7	25.9
Non-OECD Europe and Eurasia¹	2 403.4	1 225.7	143.6	332.7	379.2	272.3	322.3	219.8
Algeria	130.4	36.8	12.8	10.7	46.5	44.3	23.5	20.4
Angola	20.4	3.8	0.2	2.2	9.1	8.3	5.1	1.9
Benin	5.3	0.2	-	0.4	4.6	4.6	0.1	0.1
Botswana	7.1	3.8	-	0.7	2.4	2.3	0.2	0.0
Cameroon	6.0	1.2	0.4	0.5	3.5	3.3	0.5	0.5
Congo	2.7	0.5	-	0.1	2.1	1.7	0.1	0.1
Côte d'Ivoire	9.7	3.8	0.2	1.4	3.2	2.8	1.1	0.4
Dem. Rep. of the Congo	2.7	0.0	-	0.0	2.7	2.2	0.0	0.0
Egypt	198.6	86.0	11.8	26.7	55.0	52.3	19.2	16.3
Eritrea	0.6	0.3	-	0.0	0.2	0.2	0.1	0.0
Ethiopia	10.2	0.0	-	3.5	4.9	4.7	1.8	0.8
Gabon	3.2	0.9	0.0	1.2	0.8	0.8	0.4	0.2
Ghana	14.0	3.3	0.0	1.8	7.9	7.3	1.1	0.8
Kenya	14.1	1.1	0.1	3.4	8.1	7.9	1.5	1.3
Libya	45.3	24.9	0.5	0.9	17.8	17.8	1.2	1.2
Mauritius	4.0	2.4	-	0.3	1.0	1.0	0.2	0.1
Morocco	54.9	21.6	0.6	7.7	15.9	15.8	9.0	6.2
Mozambique	5.0	1.3	0.0	0.8	2.5	2.3	0.4	0.1
Namibia	3.8	0.0	-	0.3	2.1	2.0	1.3	0.0
Niger	2.0	0.5	-	0.2	1.2	1.2	0.1	0.1
Nigeria	64.4	13.0	11.2	7.5	24.6	24.5	8.1	1.6
Senegal	6.6	2.4	0.0	1.2	2.6	2.5	0.4	0.3
South Africa	427.6	244.4	43.6	56.0	53.6	49.9	30.1	15.3
South Sudan	1.1	0.3	0.1	0.0	0.7	0.7	0.0	0.0
Sudan	15.4	4.0	0.2	1.8	7.9	7.9	1.5	0.5
United Rep. of Tanzania	11.6	2.8	-	1.4	7.0	7.0	0.4	0.3
Togo	1.9	0.0	-	0.2	1.5	1.5	0.2	0.2
Tunisia	25.6	9.2	0.5	5.4	6.7	6.5	3.8	2.0
Zambia	3.3	0.3	0.0	1.5	1.1	1.1	0.3	0.0
Zimbabwe	11.8	7.1	0.1	1.0	2.5	2.3	1.0	0.2
Other Africa	30.9	8.4	0.9	4.1	13.9	13.3	3.7	1.5
Africa	1 140.4	484.2	83.3	143.1	313.5	300.0	116.2	72.4

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions by sector in 2015million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
Bangladesh	70.5	33.5	0.1	16.8	9.3	7.1	10.8	7.4
Brunei Darussalam	6.0	2.4	1.7	0.4	1.4	1.4	0.1	0.1
Cambodia	8.0	2.5	-	0.2	4.2	3.6	1.1	0.5
DPR of Korea	22.5	3.6	0.0	13.3	1.4	1.4	4.2	0.1
India	2 066.0	1 066.7	36.7	534.8	254.4	236.5	173.4	86.5
Indonesia	441.9	171.4	24.0	90.5	128.6	113.1	27.4	20.0
Malaysia	220.4	103.1	20.4	28.8	61.4	59.0	6.7	1.8
Mongolia	17.2	11.8	0.0	1.4	2.0	1.5	1.9	1.1
Myanmar	24.4	4.9	0.8	5.2	10.3	8.9	3.2	0.0
Nepal	5.6	-	-	2.2	2.3	2.3	1.1	0.4
Pakistan	146.0	45.5	1.5	38.9	40.8	39.6	19.3	15.7
Philippines	103.9	50.6	1.3	14.1	30.8	26.3	7.1	2.6
Singapore	44.4	21.9	4.5	10.7	6.6	6.5	0.6	0.2
Sri Lanka	19.5	6.8	0.0	3.0	8.7	8.4	1.0	0.5
Chinese Taipei	249.4	148.7	14.6	39.7	36.6	35.9	9.8	4.3
Thailand	247.5	90.8	19.5	54.4	64.6	61.6	18.3	4.2
Viet Nam	168.3	73.5	-	50.7	32.1	31.2	12.0	6.8
Other non-OECD Asia	25.3	7.9	-	5.4	10.3	8.5	1.7	0.6
Asia (excl. China)	3 886.8	1 845.6	125.1	910.7	705.7	652.7	299.6	152.9
People's Rep. of China	9 040.7	4 395.4	337.1	2 768.9	836.6	691.0	702.8	359.0
Hong Kong, China	43.9	27.9	-	7.1	7.3	7.3	1.6	0.8
China	9 084.6	4 423.3	337.1	2 776.0	843.9	698.2	704.4	359.8
Argentina	191.4	55.7	18.2	31.4	46.8	41.7	39.4	23.7
Bolivia	18.3	3.4	0.8	1.9	7.7	7.3	4.5	1.4
Brazil	450.8	91.1	28.8	93.8	197.3	178.5	39.9	18.0
Colombia	72.3	13.8	5.2	14.8	29.7	28.6	8.7	3.6
Costa Rica	6.9	0.1	0.0	1.0	5.3	5.3	0.5	0.2
Cuba	29.9	15.6	0.6	8.5	1.4	1.3	3.7	0.6
Curaçao ¹	4.9	0.6	2.6	0.4	1.1	1.1	0.2	0.2
Dominican Republic	21.4	11.1	0.1	3.0	5.6	4.3	1.6	1.3
Ecuador	37.6	8.7	1.4	4.4	16.9	16.1	6.2	2.4
El Salvador	6.5	1.6	-	0.8	3.4	3.4	0.7	0.6
Guatemala	15.1	4.7	0.1	2.0	7.4	7.4	0.9	0.9
Haiti	3.2	0.9	-	0.6	1.4	1.4	0.3	0.3
Honduras	9.2	3.5	-	1.3	4.1	3.9	0.4	0.3
Jamaica	7.0	2.7	-	2.3	1.7	1.7	0.3	0.1
Nicaragua	5.1	1.6	0.0	0.6	2.2	2.0	0.6	0.1
Panama	10.7	3.2	-	2.4	4.3	4.3	0.8	0.6
Paraguay	5.7	0.0	-	0.2	5.3	5.3	0.2	0.2
Peru	49.1	11.8	3.9	8.9	20.8	20.3	3.8	2.3
Suriname	2.1	0.9	0.0	0.1	0.7	0.4	0.4	0.0
Trinidad and Tobago	22.8	6.0	8.2	4.7	3.4	3.0	0.4	0.4
Uruguay	6.4	0.7	0.4	0.8	3.5	3.5	1.0	0.4
Venezuela	136.8	33.2	22.0	30.3	45.5	45.5	5.9	4.5
Other non-OECD Americas	19.4	10.1	0.0	0.8	5.8	5.5	2.6	0.4
Non-OECD Americas	1 132.5	281.0	92.6	214.9	421.2	391.8	122.9	62.4
Bahrain	30.1	20.4	3.7	2.1	3.5	3.4	0.3	0.3
Islamic Republic of Iran	552.4	154.6	37.9	87.9	136.6	121.4	135.4	105.6
Iraq	132.1	78.6	11.2	8.7	25.3	25.3	8.3	8.3
Jordan	23.8	11.2	0.6	1.8	7.8	7.8	2.3	1.5
Kuwait	85.4	42.4	13.7	15.9	12.7	12.7	0.6	0.6
Lebanon	22.7	12.9	-	1.1	5.6	5.6	3.1	3.1
Oman	64.3	16.7	7.6	23.9	13.1	13.1	3.0	0.5
Qatar	79.9	20.2	30.9	13.6	15.0	15.0	0.3	0.3
Saudi Arabia	531.5	245.7	26.9	112.1	142.1	139.3	4.6	4.6
Syrian Arab Republic	26.2	11.2	0.6	3.6	6.4	6.3	4.5	2.3
United Arab Emirates	180.2	72.3	2.6	73.4	30.9	29.9	1.0	1.0
Yemen	11.1	3.9	0.8	1.2	3.1	3.1	2.3	1.8
Middle East	1 739.7	690.2	136.3	345.3	402.1	382.9	165.8	129.9

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions with electricity and heat allocated to consuming sectors ¹ in 2015million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Other energy ind. own use ²	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
World ³	32 294.2	2 223.6	11 907.4	7 973.1	5 877.7	10 190.2	5 382.2
<i>Annex I Parties</i>	12 406.5	975.6	2 935.1	3 582.2	3 032.8	4 913.6	2 590.8
<i>Annex II Parties</i>	9 741.7	724.4	2 104.5	3 067.2	2 661.8	3 845.5	1 913.4
<i>North America</i>	5 546.7	439.4	954.0	1 931.2	1 634.1	2 222.1	1 086.6
<i>Europe</i>	2 641.3	180.2	655.1	804.1	748.1	1 001.9	557.9
<i>Asia Oceania</i>	1 553.7	104.8	495.4	331.9	279.6	621.5	269.0
<i>Annex I EIT</i>	2 340.1	235.6	719.9	439.6	301.8	945.0	621.2
<i>Non-Annex I Parties</i>	18 700.9	1 248.0	8 972.2	3 204.1	2 844.9	5 276.6	2 791.4
<i>Annex B Kyoto Parties</i>	4 126.0	342.8	1 110.4	1 091.6	994.9	1 581.1	885.6
Non-OECD Total	19 387.3	1 339.4	9 132.9	3 258.1	2 781.5	5 656.8	3 133.3
OECD Total	11 720.2	884.1	2 774.4	3 528.2	3 096.2	4 533.4	2 248.9
Canada	549.2	122.9	95.5	174.8	140.2	156.1	72.6
Chile	81.6	2.6	36.1	25.7	22.7	17.2	8.9
Mexico	442.3	52.9	142.5	151.1	145.9	95.8	48.3
United States	4 997.5	316.5	858.5	1 756.4	1 493.9	2 066.1	1 013.9
OECD Americas	6 070.7	495.0	1 132.7	2 108.0	1 802.7	2 335.1	1 143.8
Australia	380.9	44.3	107.0	99.3	79.7	130.2	59.3
Israel ⁴	62.3	2.8	12.1	16.9	16.8	30.6	12.8
Japan	1 141.6	58.7	380.0	218.2	187.0	484.7	207.3
Korea	586.0	52.0	240.7	98.3	92.3	195.0	75.7
New Zealand	31.2	1.8	8.4	14.4	13.0	6.6	2.3
OECD Asia Oceania	2 201.9	159.6	748.2	447.1	388.8	847.0	357.5
Austria	62.1	6.9	15.9	23.2	21.9	16.1	9.8
Belgium	92.5	6.5	26.7	26.6	25.5	32.7	19.8
Czech Republic	99.6	6.5	31.6	18.4	16.9	43.1	25.1
Denmark	32.0	2.4	5.0	11.6	10.7	12.9	7.1
Estonia	15.5	0.7	2.9	2.3	2.2	9.5	4.9
Finland	42.1	3.5	14.3	11.0	10.2	13.3	6.3
France	290.5	17.8	48.2	123.1	118.0	101.4	55.1
Germany	729.8	32.0	231.0	163.2	152.5	303.6	173.1
Greece	64.6	5.1	13.6	16.9	14.4	29.0	15.8
Hungary	42.5	1.6	11.0	12.2	11.7	17.6	10.6
Iceland	2.1	0.0	0.5	0.8	0.8	0.7	0.0
Ireland	35.3	0.4	8.5	11.1	10.7	15.3	9.7
Italy	330.7	19.5	80.0	106.3	97.5	125.0	70.1
Latvia	6.8	-	1.1	3.1	2.8	2.7	1.3
Luxembourg	8.8	-	1.2	5.8	5.7	1.8	1.1
Netherlands	156.0	14.5	47.1	30.9	28.9	63.5	27.7
Norway	36.7	12.4	6.4	14.3	10.9	3.7	0.9
Poland	282.4	19.6	68.7	48.6	45.3	145.4	86.8
Portugal	47.0	4.0	12.2	15.9	15.1	15.0	6.1
Slovak Republic	29.4	5.4	9.8	6.1	5.7	8.2	4.6
Slovenia	12.8	0.0	3.7	5.3	5.2	3.7	2.0
Spain	247.0	21.0	54.9	87.6	78.7	83.5	40.1
Sweden	37.1	2.9	8.8	19.8	19.1	5.5	2.7
Switzerland	37.3	0.4	5.9	16.3	15.9	14.7	9.3
Turkey	317.2	15.5	109.6	73.0	66.9	119.1	54.5
United Kingdom	389.8	30.8	75.0	119.8	111.8	164.2	103.1
OECD Europe ⁴	3 447.6	229.6	893.6	973.2	904.8	1 351.2	747.7
<i>IEA/Accession/Association</i>	23 531.8	1 550.4	9 544.5	4 955.5	4 278.4	7 481.4	3 791.3
<i>European Union - 28</i>	3 201.2	213.0	813.1	907.2	846.5	1 268.0	715.7
<i>G20</i>	26 278.7	1 840.1	10 405.8	5 565.4	4 743.5	8 467.4	4 425.9
<i>Africa</i>	1 140.4	98.4	352.6	318.9	300.0	370.5	212.8
<i>Americas</i>	7 203.2	592.3	1 455.5	2 530.4	2 194.4	2 625.0	1 296.8
<i>Asia</i>	17 258.6	1 067.5	8 576.6	2 557.6	2 220.2	5 056.9	2 595.7
<i>Europe</i>	5 080.0	419.3	1 402.6	1 262.0	1 067.5	1 996.1	1 213.0
<i>Oceania</i>	425.4	46.1	121.6	117.5	95.7	140.2	63.5

1. CO₂ emissions from electricity and heat generation have been allocated to final consuming sectors in proportion to the electricity and heat consumed.

2. Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. 3. World includes international bunkers in the transport sector. 4. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions with electricity and heat allocated to consuming sectors in 2015

million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
Non-OECD Total	19 387.3	1 339.4	9 132.9	3 258.1	2 781.5	5 656.8	3 133.3
Albania	3.8	0.1	0.7	2.4	2.3	0.6	0.2
Armenia	4.7	-	0.8	1.5	1.5	2.4	1.3
Azerbaijan	30.8	3.7	4.1	7.3	6.3	15.7	10.6
Belarus	53.2	5.9	12.8	10.8	8.8	23.7	13.7
Bosnia and Herzegovina	22.2	1.3	7.0	3.2	3.1	10.8	7.5
Bulgaria	43.8	3.2	12.9	9.2	8.6	18.4	10.8
Croatia	15.5	1.5	2.9	5.9	5.6	5.2	2.9
Cyprus ¹	5.9	0.0	0.9	1.8	1.8	3.2	1.4
FYR of Macedonia	7.2	0.1	2.2	1.9	1.8	3.1	2.0
Georgia	8.4	0.0	2.0	3.6	3.6	2.7	1.7
Gibraltar	0.6	-	-	0.4	0.4	0.2	-
Kazakhstan	225.1	57.6	87.7	16.8	13.3	63.1	34.2
Kosovo	8.6	0.0	2.5	1.1	1.1	4.9	3.4
Kyrgyzstan	9.9	0.1	2.3	2.7	2.7	4.8	3.5
Lithuania	10.5	1.6	1.6	5.1	4.8	2.2	1.2
Malta	1.6	-	0.2	0.6	0.5	0.9	0.3
Republic of Moldova	7.6	0.0	1.7	2.0	1.9	3.9	2.5
Montenegro	2.4	-	0.6	0.6	0.5	1.2	0.7
Romania	69.5	5.3	23.2	15.9	14.9	25.0	16.1
Russian Federation	1 469.0	174.9	460.3	270.6	150.4	563.1	388.8
Serbia	44.5	2.0	12.7	6.1	5.8	23.6	17.2
Tajikistan	4.3	0.0	0.1	2.3	2.3	1.9	0.1
Turkmenistan	69.1	7.9	7.7	12.1	7.9	41.3	3.6
Ukraine	189.4	9.2	77.1	26.0	18.9	77.1	52.4
Uzbekistan	95.6	3.8	22.0	7.2	3.6	62.6	30.4
Non-OECD Europe and Eurasia¹	2 403.4	278.3	746.2	417.3	272.5	961.6	606.6
Algeria	130.4	13.4	23.3	47.2	44.3	46.4	34.6
Angola	20.4	0.2	3.5	9.1	8.3	7.6	4.4
Benin	5.3	-	0.5	4.6	4.6	0.2	0.1
Botswana	7.1	-	2.3	2.4	2.3	2.4	1.1
Cameroon	6.0	0.4	1.1	3.5	3.3	1.0	0.7
Congo	2.7	-	0.3	2.1	1.7	0.3	0.3
Côte d'Ivoire	9.7	0.2	2.6	3.2	2.8	3.7	1.6
Dem. Rep. of the Congo	2.7	-	0.1	2.7	2.2	0.0	0.0
Egypt	198.6	11.8	48.6	55.3	52.3	82.9	53.8
Eritrea	0.6	-	0.1	0.2	0.2	0.3	0.2
Ethiopia	10.2	-	3.5	4.9	4.7	1.8	0.8
Gabon	3.2	0.1	1.4	0.8	0.8	1.0	0.6
Ghana	14.0	0.0	3.4	7.9	7.3	2.8	1.7
Kenya	14.1	0.1	4.0	8.1	7.9	2.0	1.6
Libya	45.3	0.5	4.5	17.8	17.8	22.5	11.0
Mauritius	4.0	0.0	1.2	1.0	1.0	1.7	0.9
Morocco	54.9	0.8	15.5	16.1	15.8	22.4	13.4
Mozambique	5.0	0.0	1.7	2.5	2.3	0.8	0.3
Namibia	3.8	-	0.3	2.1	2.0	1.4	0.0
Niger	2.0	0.0	0.3	1.2	1.2	0.4	0.4
Nigeria	64.4	11.3	9.7	24.6	24.5	18.9	9.0
Senegal	6.6	0.0	1.9	2.6	2.5	2.1	1.1
South Africa	427.6	57.2	197.3	57.6	49.9	115.5	58.9
South Sudan	1.1	0.1	0.0	0.7	0.7	0.3	0.1
Sudan	15.4	0.2	2.4	7.9	7.9	4.9	2.8
United Rep. of Tanzania	11.6	0.0	2.2	7.0	7.0	2.4	1.5
Togo	1.9	-	0.2	1.5	1.5	0.2	0.2
Tunisia	25.6	0.7	8.5	6.8	6.5	9.6	4.7
Zambia	3.3	0.0	1.7	1.1	1.1	0.4	0.1
Zimbabwe	11.8	0.1	3.7	2.5	2.3	5.5	2.5
Other Africa	30.9	1.0	7.1	13.9	13.3	8.9	4.4
Africa	1 140.4	98.4	352.6	318.9	300.0	370.5	212.8

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions with electricity and heat allocated to consuming sectors in 2015

million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
Bangladesh	70.5	0.1	35.4	9.3	7.1	25.7	18.7
Brunei Darussalam	6.0	1.9	0.5	1.4	1.4	2.2	1.0
Cambodia	8.0	-	0.7	4.2	3.6	3.1	1.8
DPR of Korea	22.5	0.0	15.1	1.4	1.4	6.0	0.1
India	2 066.0	42.4	1 001.2	271.8	236.5	750.6	341.7
Indonesia	441.9	24.0	144.7	128.6	113.1	144.6	92.7
Malaysia	220.4	20.4	75.9	61.6	59.0	62.5	24.1
Mongolia	17.2	0.0	5.7	2.0	1.5	9.4	5.3
Myanmar	24.4	0.8	6.0	10.3	8.9	7.3	1.3
Nepal	5.6	-	2.2	2.3	2.3	1.1	0.4
Pakistan	146.0	1.5	52.3	40.8	39.6	51.5	37.4
Philippines	103.9	1.3	30.9	30.9	26.3	40.8	19.6
Singapore	44.4	4.5	19.4	7.8	6.5	12.7	3.5
Sri Lanka	19.5	0.0	5.2	8.7	8.4	5.6	3.3
Chinese Taipei	249.4	17.0	124.2	37.5	35.9	70.7	32.8
Thailand	247.5	19.5	94.0	64.7	61.6	69.3	25.2
Viet Nam	168.3	-	90.2	32.1	31.2	46.1	32.7
Other non-OECD Asia	25.3	-	8.6	10.3	8.5	6.4	2.9
Asia (excl. China)	3 886.8	133.4	1 712.3	725.4	652.7	1 315.6	644.4
People's Rep. of China	9 040.7	577.8	5 512.6	964.3	774.4	1 986.0	1 082.0
Hong Kong, China	43.9	-	9.1	7.3	7.3	27.5	8.2
China	9 084.6	577.8	5 521.7	971.6	781.7	2 013.5	1 090.2
Argentina	191.4	18.2	53.0	47.0	41.7	73.1	43.9
Bolivia	18.3	0.8	2.8	7.7	7.3	6.9	2.7
Brazil	450.8	32.8	128.6	197.8	178.5	91.6	41.2
Colombia	72.3	5.2	19.1	29.8	28.6	18.2	9.5
Costa Rica	6.9	0.0	1.0	5.3	5.3	0.5	0.2
Cuba	29.9	0.6	12.2	1.7	1.3	15.4	8.8
Curaçao ¹	4.9	2.6	0.7	1.1	1.1	0.4	0.2
Dominican Republic	21.4	0.1	7.1	5.6	4.3	8.6	5.0
Ecuador	37.6	1.4	7.7	16.9	16.1	11.5	5.0
El Salvador	6.5	-	1.4	3.4	3.4	1.7	1.1
Guatemala	15.1	0.1	3.8	7.4	7.4	3.8	2.6
Haiti	3.2	-	1.0	1.4	1.4	0.8	0.7
Honduras	9.2	-	2.2	4.1	3.9	2.9	1.6
Jamaica	7.0	-	3.3	1.7	1.7	2.0	1.0
Nicaragua	5.1	0.0	1.2	2.2	2.0	1.7	0.7
Panama	10.7	-	2.7	4.3	4.3	3.7	1.6
Paraguay	5.7	-	0.2	5.3	5.3	0.2	0.2
Peru	49.1	3.9	15.4	20.8	20.3	9.1	4.9
Suriname	2.1	0.0	0.5	0.7	0.4	0.9	0.3
Trinidad and Tobago	22.8	8.2	8.4	3.4	3.0	2.8	2.1
Uruguay	6.4	0.4	1.0	3.5	3.5	1.5	0.7
Venezuela	136.8	22.7	44.4	45.6	45.5	24.2	14.7
Other non-OECD Americas	19.4	0.0	5.1	5.8	5.5	8.4	4.3
Non-OECD Americas	1 132.5	97.3	322.8	422.4	391.8	289.9	153.1
Bahrain	30.1	3.7	12.4	3.5	3.4	10.4	5.9
Islamic Republic of Iran	552.4	39.7	128.0	137.0	121.4	247.6	160.7
Iraq	132.1	11.2	22.9	25.3	25.3	72.6	44.9
Jordan	23.8	0.7	4.4	7.8	7.8	10.9	6.5
Kuwait	85.4	19.6	15.9	12.7	12.7	37.1	24.2
Lebanon	22.7	-	4.5	5.6	5.6	12.7	8.1
Oman	64.3	7.6	26.6	13.1	13.1	17.0	8.4
Qatar	79.9	30.9	20.2	15.0	15.0	13.9	8.7
Saudi Arabia	531.5	36.8	152.0	142.1	139.3	200.5	121.0
Syrian Arab Republic	26.2	0.6	7.3	6.4	6.3	11.9	7.4
United Arab Emirates	180.2	2.6	81.9	30.9	29.9	64.9	25.7
Yemen	11.1	0.8	1.3	3.1	3.1	6.0	4.6
Middle East	1 739.7	154.1	477.4	402.5	382.9	705.7	426.2

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / TPEStonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	60.3	59.8	58.7	56.4	55.8	55.3	55.1	56.2	56.5	56.8	56.5	1.2%
<i>Annex I Parties</i>	..	..	..	..	58.7	56.5	56.1	55.3	53.8	53.1	52.6	-10.3%
<i>Annex II Parties</i>	65.8	63.9	61.4	58.9	57.5	55.6	55.6	55.1	53.6	53.3	52.7	-8.3%
<i>North America</i>	63.9	62.1	60.0	59.6	58.7	57.3	58.2	57.6	56.6	54.8	53.9	-8.1%
<i>Europe</i>	68.6	65.8	63.6	57.7	55.1	52.3	50.7	49.9	47.3	45.6	45.6	-17.1%
<i>Asia Oceania</i>	66.5	66.8	61.7	59.1	58.8	56.4	56.3	58.2	56.7	64.9	64.5	9.7%
<i>Annex I EIT</i>	..	..	..	..	61.8	60.0	58.0	55.4	54.1	51.4	51.5	-16.7%
<i>Non-Annex I Parties</i>	..	..	..	..	49.3	52.2	52.4	56.1	57.9	58.7	58.5	18.8%
<i>Annex B Kyoto Parties</i>	..	..	..	..	59.8	56.4	54.3	53.4	51.5	50.3	50.2	-16.1%
Non-OECD Total	49.1	51.9	53.0	51.3	52.4	53.1	52.7	55.8	57.3	58.0	57.8	10.3%
OECD Total	66.2	64.4	62.1	59.9	58.0	56.3	56.1	55.5	54.2	53.7	53.2	-8.3%
Canada	57.5	54.3	52.5	48.7	47.4	45.9	48.6	47.5	47.6	47.5	48.6	2.4%
Chile	57.7	53.5	53.9	48.9	50.2	48.3	46.1	45.8	53.1	51.4	54.0	7.6%
Mexico	52.1	54.3	51.4	53.0	49.6	52.8	57.0	54.5	58.9	55.1	56.4	13.7%
United States	64.5	62.9	60.8	60.8	59.9	58.6	59.3	58.7	57.7	55.7	54.5	-8.9%
OECD Americas	63.6	61.8	59.6	59.2	58.1	57.0	58.0	57.2	56.7	54.7	54.1	-7.0%
Australia	66.3	71.0	70.9	72.5	71.8	73.5	77.5	78.3	72.8	71.2	72.6	1.1%
Israel ²	57.3	55.8	57.5	76.7	68.3	69.1	71.8	76.1	70.5	68.2	64.7	-5.3%
Japan	67.0	66.5	60.3	57.0	56.7	53.7	52.6	54.2	53.3	64.4	63.4	11.8%
Korea	74.5	75.9	72.7	70.0	59.6	58.9	54.8	52.0	52.6	50.5	51.3	-13.8%
New Zealand	47.2	45.9	43.8	40.3	40.5	38.4	40.5	47.5	39.4	36.4	36.1	-10.9%
OECD Asia Oceania	66.7	67.1	62.6	60.5	59.1	57.1	56.3	57.1	56.0	60.6	60.4	2.2%
Austria	61.7	58.7	56.1	54.5	54.0	53.1	51.7	52.8	48.5	45.3	45.3	-16.2%
Belgium	71.0	65.2	64.1	54.7	52.9	49.8	46.8	44.1	41.2	39.4	41.5	-21.7%
Czech Republic	80.8	84.8	85.5	85.1	72.1	70.5	70.4	62.5	59.6	56.0	56.4	-21.8%
Denmark	71.5	71.9	78.7	75.5	70.1	71.9	65.1	61.2	57.9	51.1	47.4	-32.3%
Estonia	..	..	..	..	87.9	73.2	73.5	77.1	79.2	74.2	68.4	-22.1%
Finland	52.4	53.5	53.3	44.6	45.3	46.0	40.3	38.1	40.5	31.8	30.9	-31.7%
France	63.7	61.2	56.7	41.2	36.8	34.6	34.6	32.8	31.2	28.0	28.1	-23.6%
Germany	76.6	74.2	70.1	67.2	63.9	60.8	57.7	55.7	55.6	56.5	56.6	-11.4%
Greece	68.9	69.4	72.0	74.2	77.9	80.6	77.6	75.2	72.2	67.9	66.5	-14.6%
Hungary	75.6	73.2	69.6	64.0	54.5	52.0	50.9	47.4	42.5	40.1	40.3	-26.2%
Iceland	37.2	34.9	27.9	22.0	19.9	21.2	16.5	17.1	8.6	8.3	8.8	-55.9%
Ireland	76.9	76.0	75.1	73.2	72.6	73.2	70.7	72.5	65.3	63.4	63.6	-12.3%
Italy	65.6	64.8	64.8	63.2	63.4	60.2	58.5	58.5	53.9	52.0	51.8	-18.4%
Latvia	..	..	..	..	56.8	46.2	42.6	40.0	42.8	37.0	38.3	-32.5%
Luxembourg	96.7	80.6	83.5	80.6	75.7	62.4	57.4	62.5	60.2	57.9	56.4	-25.4%
Netherlands	59.9	53.4	53.9	54.5	52.5	52.9	51.1	49.0	48.6	48.6	50.5	-3.9%
Norway	41.2	38.5	35.4	31.5	31.1	31.9	29.1	30.7	26.4	30.4	29.6	-4.9%
Poland	79.7	78.6	78.5	80.9	79.9	80.1	77.9	76.9	73.2	70.9	71.1	-11.0%
Portugal	54.7	56.0	56.8	52.1	53.9	55.9	56.2	55.4	48.3	48.3	51.1	-5.1%
Slovak Republic	65.1	61.5	67.2	62.7	61.4	55.4	49.6	47.3	46.3	43.7	42.9	-30.1%
Slovenia	..	..	..	..	56.6	55.4	52.4	50.6	50.4	45.8	46.7	-17.6%
Spain	66.7	64.7	65.7	58.3	53.7	54.1	54.6	56.1	49.0	48.4	49.6	-7.7%
Sweden	54.4	48.3	43.1	29.5	26.3	27.0	26.1	22.7	21.6	18.5	19.5	-26.1%
Switzerland	56.7	51.1	46.8	45.2	39.9	41.1	40.1	40.5	39.4	36.1	36.3	-9.0%
Turkey	51.0	53.2	54.3	57.9	57.8	59.0	63.4	61.4	59.5	60.3	58.8	1.8%
United Kingdom	71.1	69.0	68.7	64.6	63.7	56.7	55.8	57.0	55.9	54.0	51.5	-19.2%
OECD Europe ²	69.6	67.2	65.6	60.7	57.5	54.8	53.2	52.0	49.7	48.3	48.3	-16.1%
<i>IEA/Accession/Association</i>	62.3	61.0	59.5	57.8	56.5	56.8	56.7	58.3	59.0	59.8	59.5	5.3%
<i>European Union - 28</i>	..	..	..	..	58.4	55.2	53.3	52.2	50.0	48.2	48.2	-17.5%
<i>G20</i>	..	..	..	..	56.7	56.6	56.5	57.9	58.3	58.9	58.6	3.3%
<i>Africa</i>	31.0	34.8	34.8	32.9	32.2	31.0	31.7	34.1	34.2	34.6	34.6	7.5%
<i>Americas</i>	61.6	59.8	57.7	56.7	55.9	55.0	56.1	55.2	54.1	52.7	52.0	-7.0%
<i>Asia</i>	..	..	..	..	54.1	56.7	56.4	60.4	61.9	63.6	63.3	17.1%
<i>Europe</i>	..	..	..	..	58.9	55.9	53.9	52.3	50.4	48.4	48.5	-17.7%
<i>Oceania</i>	63.3	67.0	66.9	67.2	66.7	67.6	71.2	73.5	68.0	65.8	66.9	0.3%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / TPEStonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	49.1	51.9	53.0	51.3	52.4	53.1	52.7	55.8	57.3	58.0	57.8	10.3%
Albania	53.7	52.1	53.0	61.0	50.7	33.2	41.1	42.2	44.2	42.1	41.7	-17.8%
Armenia	..	..	..	..	61.5	48.9	40.6	39.3	38.9	42.1	36.6	-40.5%
Azerbaijan	..	..	..	..	56.4	55.6	57.7	51.6	48.5	51.3	51.2	-9.1%
Belarus	..	..	..	..	52.4	55.0	50.7	49.1	52.0	49.4	50.3	-4.0%
Bosnia and Herzegovina	..	..	..	..	81.7	52.5	75.4	75.2	75.5	66.0	66.1	-19.0%
Bulgaria	80.1	75.3	71.6	64.1	63.1	54.6	54.2	55.8	59.3	55.6	56.2	-10.9%
Croatia	..	..	..	..	51.3	45.2	47.8	48.8	46.4	44.9	44.1	-14.0%
Cyprus ¹	70.9	70.1	71.1	71.8	68.1	71.1	70.4	75.8	71.0	69.9	69.9	2.8%
FYR of Macedonia	..	..	..	..	82.9	79.5	76.4	74.8	69.3	66.1	64.6	-22.1%
Georgia	..	..	..	..	64.4	52.2	38.6	34.2	38.2	42.0	43.2	-32.9%
Gibraltar	55.4	47.4	68.8	59.2	59.2	63.9	63.5	64.2	65.4	65.7	66.2	11.7%
Kazakhstan	..	..	..	..	77.1	78.0	75.0	73.7	76.4	71.6	68.9	-10.7%
Kosovo	..	..	..	..	..	..	79.1	81.6	83.4	80.0	81.8	..
Kyrgyzstan	..	..	..	..	72.6	44.7	45.8	45.4	52.4	52.8	59.3	-18.4%
Lithuania	..	..	..	..	47.9	36.8	34.2	33.6	41.7	35.7	34.9	-27.2%
Malta	74.2	74.3	74.4	80.3	79.6	80.1	75.3	73.9	73.6	72.6	61.3	-23.0%
Republic of Moldova	..	..	..	..	73.7	60.2	54.1	52.6	53.5	52.4	53.5	-27.4%
Montenegro	..	..	..	..	..	..	..	46.9	54.8	55.4	55.8	..
Romania	65.0	64.8	64.9	64.3	64.6	60.3	56.9	57.3	51.0	51.6	52.0	-19.4%
Russian Federation	..	..	..	..	58.8	58.1	56.9	54.3	53.0	49.0	49.4	-15.9%
Serbia	..	..	..	..	75.1	77.3	74.8	73.7	70.2	68.7	72.1	-4.0%
Tajikistan	..	..	..	..	49.6	26.4	24.2	24.0	25.3	37.7	38.2	-22.9%
Turkmenistan	..	..	..	..	60.9	58.0	58.8	59.9	59.9	59.8	59.7	-1.9%
Ukraine	..	..	..	..	65.2	57.7	52.7	49.1	48.0	53.0	50.2	-23.0%
Uzbekistan	..	..	..	..	59.2	52.8	53.5	54.3	53.6	53.5	53.6	-9.4%
Former Soviet Union ¹	60.4	63.0	63.2	58.9	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	67.4	68.8	59.7	69.5	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	61.2	63.5	63.4	59.6	61.2	58.6	56.6	54.7	54.3	51.9	51.9	-15.2%
Algeria	59.2	58.6	59.1	56.6	55.1	54.5	54.4	57.1	56.9	56.9	57.6	4.7%
Angola	10.0	11.3	13.9	13.5	15.9	14.7	15.4	17.4	29.7	31.4	32.6	104.9%
Benin	6.6	8.9	7.0	7.3	3.7	2.9	17.2	25.6	29.5	27.0	27.8	653.6%
Botswana	..	..	..	41.6	55.0	52.6	53.7	54.7	36.3	61.1	62.0	12.7%
Cameroon	6.5	8.0	10.9	12.7	12.7	10.6	10.6	9.6	17.3	17.9	18.4	45.4%
Congo	26.9	26.2	26.7	23.7	19.4	15.9	16.7	18.5	26.1	24.0	24.3	25.4%
Côte d'Ivoire	23.4	24.5	22.7	19.7	14.9	15.1	22.3	14.4	14.7	15.4	17.8	19.5%
Dem. Rep. of the Congo	9.2	8.4	8.9	7.8	6.1	2.1	1.5	1.8	2.2	3.9	2.3	-62.6%
Egypt	61.4	62.4	64.5	60.0	57.6	55.5	58.7	56.0	57.5	57.4	59.7	3.6%
Eritrea	..	..	..	..	..	18.6	20.7	18.1	15.5	17.0	17.1	..
Ethiopia	2.2	1.8	1.9	1.7	2.3	2.0	2.4	2.9	3.4	5.0	4.9	115.6%
Gabon	10.6	13.9	22.4	29.5	18.4	23.4	23.8	13.8	12.5	15.6	15.3	-16.9%
Ghana	15.3	15.0	13.0	11.5	11.5	11.8	18.9	26.0	32.9	35.4	34.6	202.0%
Kenya	14.6	13.7	14.2	12.6	12.3	11.2	13.2	11.1	13.7	12.5	13.5	9.4%
Libya	56.6	56.5	59.6	50.1	55.3	56.3	55.5	57.8	55.2	64.0	62.7	13.5%
Mauritius	17.1	25.2	31.7	33.0	41.7	47.3	57.5	60.9	66.4	67.5	65.3	56.5%
Morocco	53.2	58.2	60.4	62.9	61.6	66.7	64.0	62.9	64.6	67.1	67.7	9.8%
Mozambique	10.2	8.5	8.3	5.6	4.4	4.4	4.4	4.3	5.7	8.0	9.3	112.8%
Namibia	..	..	..	..	..	45.6	44.6	44.9	47.7	47.5	48.8	..
Niger	..	..	..	..	..	..	10.5	10.1	14.5	16.1	16.0	..
Nigeria	4.1	6.7	12.4	13.3	10.1	10.6	12.1	12.8	11.1	10.7	11.0	9.5%
Senegal	23.4	27.7	31.2	32.5	30.2	31.7	35.1	39.6	34.0	38.3	38.8	28.6%
South Africa	82.6	89.8	76.1	61.6	64.0	59.9	61.4	69.3	68.6	71.3	71.9	12.3%
South Sudan	..	..	..	..	..	..	..	..	..	52.0	45.7	..
Sudan	10.9	10.3	10.5	10.0	11.9	8.6	9.8	15.7	21.4	21.4	23.5	97.3%
United Rep. of Tanzania	4.4	4.4	4.4	4.0	4.1	5.4	4.6	7.0	7.1	10.0	10.7	160.7%
Togo	11.3	9.7	9.9	7.2	10.9	8.8	10.7	9.7	15.9	12.8	13.0	19.8%
Tunisia	53.6	53.2	57.9	55.4	58.9	57.7	57.6	55.9	54.1	56.4	56.0	-4.9%
Zambia	22.9	26.5	17.3	12.9	11.3	8.2	6.2	6.8	4.6	7.6	7.7	-31.8%
Zimbabwe	31.8	28.9	29.3	31.4	41.7	36.6	31.7	25.5	22.9	24.9	25.0	-40.1%
Other Africa	8.9	9.3	11.3	8.4	7.2	7.4	8.2	8.6	9.7	10.7	10.6	47.8%
Africa	31.0	34.8	34.8	32.9	32.2	31.0	31.7	34.1	34.2	34.6	34.6	7.5%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / TPEStonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	12.1	15.7	18.7	18.5	21.4	24.8	27.4	33.5	39.0	42.4	44.4	107.6%
Brunei Darussalam	53.6	45.4	46.7	39.5	45.1	47.8	44.3	51.9	50.6	45.0	52.5	16.5%
Cambodia	..	..	..	..	..	12.4	13.7	18.4	20.7	22.9	27.2	..
DPR of Korea	85.2	84.4	85.0	85.9	84.0	83.1	84.8	84.3	79.5	71.3	68.7	-18.2%
India	28.5	30.2	31.3	36.3	41.4	45.5	48.2	50.0	54.9	58.4	58.0	39.9%
Indonesia	17.2	22.0	29.0	30.4	32.4	37.3	39.2	42.5	42.7	46.3	46.8	44.5%
Malaysia	50.5	53.6	47.6	50.5	54.2	55.0	56.2	56.6	61.8	58.7	61.3	13.0%
Mongolia	..	..	..	90.1	90.1	90.8	89.5	87.7	85.8	81.1	82.9	-8.0%
Myanmar	13.6	11.2	12.9	12.5	8.8	13.6	17.3	17.1	14.0	25.8	29.4	235.5%
Nepal	1.2	1.9	2.7	2.6	3.7	6.3	9.1	8.0	9.6	11.9	11.4	209.7%
Pakistan	22.2	23.4	23.5	27.0	31.2	35.3	35.5	36.2	36.7	36.8	37.1	19.2%
Philippines	35.9	37.9	35.5	28.6	31.6	40.7	40.7	43.9	45.6	47.8	47.6	50.3%
Singapore	53.0	54.3	58.9	58.6	60.0	47.6	53.9	41.9	41.6	41.5	41.4	-30.9%
Sri Lanka	17.3	15.3	19.1	16.7	15.9	21.7	30.2	35.5	30.4	37.2	40.7	155.8%
Chinese Taipei	71.1	68.0	61.1	49.7	55.6	57.9	60.3	59.2	54.9	54.1	54.7	-1.5%
Thailand	28.3	29.1	36.6	40.6	46.1	54.0	50.3	48.3	45.3	43.2	43.7	-5.1%
Viet Nam	29.4	29.1	24.7	26.1	23.2	30.0	36.8	45.8	51.1	51.2	54.5	134.4%
Other non-OECD Asia	44.6	46.9	51.4	37.9	35.8	32.6	33.0	39.0	43.0	44.3	43.3	21.1%
Asia (excl. China)	32.0	33.8	36.4	38.4	41.5	44.6	46.4	47.9	50.1	52.1	52.5	26.6%
People's Rep. of China	47.7	50.9	54.5	56.2	56.9	66.0	65.3	71.8	72.6	73.1	72.6	27.5%
Hong Kong, China	73.4	71.7	75.3	81.0	92.3	82.4	70.9	78.5	73.3	80.8	75.5	-18.2%
China	47.8	51.0	54.6	56.4	57.3	66.2	65.3	71.9	72.6	73.1	72.6	26.8%
Argentina	58.6	56.6	54.4	50.7	51.5	51.8	54.1	53.3	52.7	52.9	53.2	3.2%
Bolivia	51.1	52.0	41.1	40.9	47.1	43.7	34.6	41.7	52.0	53.0	52.7	11.9%
Brazil	29.9	34.0	35.2	28.8	31.4	33.8	37.2	34.4	33.3	37.4	36.1	15.1%
Colombia	46.0	43.8	46.9	47.2	45.1	47.1	50.1	47.2	46.1	51.1	51.1	13.3%
Costa Rica	37.6	41.7	41.0	36.8	37.1	45.0	37.4	33.6	34.0	35.2	33.6	-9.4%
Cuba	47.4	49.2	49.7	50.2	46.8	49.4	51.3	56.1	63.2	60.0	59.2	26.5%
Curaçao ¹	63.3	63.4	52.8	60.2	43.6	47.8	63.7	68.5	51.3	57.5	56.5	29.5%
Dominican Republic	35.6	40.4	44.0	44.0	44.0	51.1	60.5	61.6	63.2	63.2	61.9	40.5%
Ecuador	37.3	45.1	49.7	49.6	50.2	50.6	49.1	61.2	65.0	65.2	59.6	18.6%
El Salvador	17.8	20.3	15.1	14.9	20.4	32.5	31.1	33.1	31.9	34.5	35.7	75.4%
Guatemala	19.8	21.6	26.5	20.2	17.4	26.3	29.1	32.5	24.2	29.2	28.5	64.1%
Haiti	6.0	5.7	7.1	10.1	14.3	12.7	16.4	13.9	13.2	15.9	17.9	25.5%
Honduras	19.3	20.6	21.6	19.9	21.8	30.2	35.8	41.6	38.4	39.0	38.8	77.8%
Jamaica	65.7	66.3	68.6	64.7	62.1	62.8	61.3	66.1	61.9	60.6	57.7	-7.1%
Nicaragua	29.2	30.0	28.1	22.3	21.7	26.6	33.6	33.6	34.5	30.0	31.4	44.3%
Panama	35.9	43.7	49.2	40.8	41.1	48.9	45.3	55.5	58.5	60.0	59.9	45.9%
Paraguay	10.0	11.4	15.4	15.0	15.0	21.2	20.3	20.9	23.1	24.0	25.1	67.1%
Peru	40.3	42.1	43.3	40.7	47.0	50.7	51.6	50.1	50.2	48.3	47.7	1.5%
Suriname	..	..	..	..	..	..	55.2	62.4	56.4	68.9	74.5	..
Trinidad and Tobago	48.6	47.1	39.7	31.2	31.5	31.7	24.5	26.0	26.6	28.4	28.1	-10.9%
Uruguay	50.4	52.1	48.2	36.0	38.2	40.8	39.3	41.6	34.8	31.9	30.3	-20.6%
Venezuela	61.4	58.1	60.9	55.9	56.4	54.1	54.1	58.2	56.6	54.8	55.0	-2.5%
Other non-OECD Americas	40.2	43.1	42.4	61.2	58.0	63.4	65.0	66.7	64.6	67.8	67.7	16.6%
Non-OECD Americas	42.4	43.0	43.5	39.1	40.4	42.1	44.0	43.0	42.1	43.9	43.1	6.6%
Bahrain	49.0	58.6	61.6	52.2	48.8	50.0	47.4	47.1	48.0	50.4	50.3	3.1%
Islamic Republic of Iran	56.0	61.0	55.5	64.4	59.0	57.7	60.6	57.8	58.3	56.0	55.8	-5.4%
Iraq	61.4	60.9	64.4	61.6	62.4	67.7	64.8	66.1	65.9	68.1	65.9	5.6%
Jordan	65.5	68.2	67.6	68.2	67.9	68.1	69.9	64.1	63.2	70.1	65.9	-2.9%
Kuwait	54.8	55.7	60.4	62.6	72.9	52.2	59.1	58.8	57.3	59.4	58.8	-19.3%
Lebanon	59.2	63.0	64.2	67.8	67.4	69.3	68.1	68.5	68.2	71.3	70.9	5.3%
Oman	72.1	72.2	46.6	63.8	57.5	57.5	64.4	60.7	54.0	58.8	60.5	5.2%
Qatar	57.8	57.6	50.3	45.2	45.5	49.3	46.5	47.6	49.3	42.2	42.0	-7.6%
Saudi Arabia	41.1	61.3	76.3	61.2	62.2	54.2	57.3	58.1	54.0	56.7	57.3	-8.0%
Syrian Arab Republic	54.6	64.6	65.9	59.6	62.1	61.4	57.3	61.4	61.7	61.3	62.8	1.1%
United Arab Emirates	58.1	60.6	63.5	62.0	60.7	60.1	60.5	59.6	58.7	57.5	58.7	-3.2%
Yemen	39.1	60.6	65.3	66.8	59.8	65.9	67.1	68.3	68.5	70.7	76.5	27.9%
Middle East	53.5	60.6	63.7	61.9	60.6	57.9	59.4	58.5	57.1	57.0	57.0	-6.0%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / TFCtonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	78.5	78.7	78.8	77.6	78.1	78.0	78.6	81.4	82.8	83.1	82.2	5.2%
<i>Annex I Parties</i>	..	..	..	..	85.5	83.0	82.2	82.1	79.6	77.8	76.5	-10.6%
<i>Annex II Parties</i>	86.3	85.9	84.6	82.8	83.7	81.6	80.8	81.0	78.5	77.0	75.6	-9.7%
<i>North America</i>	82.2	83.1	81.7	82.5	85.7	84.8	84.6	84.8	82.5	79.1	77.3	-9.8%
<i>Europe</i>	92.0	88.1	87.1	81.3	78.5	74.5	71.8	71.1	67.1	64.9	64.6	-17.7%
<i>Asia Oceania</i>	90.2	93.8	91.4	88.4	89.4	86.6	87.5	91.4	91.8	97.4	95.9	7.3%
<i>Annex I EIT</i>	..	..	..	..	90.8	88.9	88.9	87.3	83.9	80.2	79.5	-12.5%
<i>Non-Annex I Parties</i>	..	..	..	..	65.8	71.1	73.9	81.2	86.3	87.8	87.1	32.4%
<i>Annex B Kyoto Parties</i>	..	..	..	..	87.2	82.7	79.3	78.2	75.7	73.8	73.3	-16.0%
Non-OECD Total	64.3	67.2	69.8	69.9	71.6	73.3	75.1	81.6	85.8	87.1	86.3	20.6%
OECD Total	87.1	86.9	85.9	84.4	84.7	82.5	81.8	81.8	79.7	78.2	77.0	-9.0%
Canada	69.7	68.3	65.0	62.5	61.9	60.5	64.4	66.0	67.1	67.5	67.8	9.5%
Chile	76.8	68.9	70.1	61.4	63.3	58.1	57.0	59.5	68.7	72.5	77.6	22.5%
Mexico	65.2	69.7	74.1	72.8	73.6	79.9	90.2	92.9	89.7	87.3	88.2	19.7%
United States	83.4	84.7	83.7	84.9	88.7	88.0	87.2	87.1	84.4	80.6	78.5	-11.5%
OECD Americas	81.7	82.6	81.3	81.9	84.9	84.3	84.6	85.0	82.8	79.5	78.0	-8.1%
Australia	94.9	104.3	105.5	106.6	109.5	109.4	114.9	123.0	121.4	110.2	111.9	2.2%
Israel ²	100.0	100.8	99.7	114.8	112.5	109.3	109.3	117.5	110.2	110.9	107.6	-4.3%
Japan	90.0	92.8	89.6	85.7	86.7	83.4	83.0	85.5	86.0	96.1	93.6	7.9%
Korea	92.9	98.5	95.9	97.3	85.3	81.5	81.1	77.8	83.4	79.6	80.3	-5.8%
New Zealand	63.4	60.4	57.0	56.8	53.5	50.2	53.4	64.2	56.0	52.6	52.8	-1.2%
OECD Asia Oceania	90.4	94.2	92.0	89.8	89.2	85.9	86.5	88.5	90.0	92.4	91.5	2.6%
Austria	79.7	74.0	69.6	66.3	67.9	66.8	62.6	64.9	59.2	54.7	55.0	-19.0%
Belgium	96.3	89.7	92.8	79.9	79.0	70.1	65.1	61.3	58.2	51.9	52.8	-33.1%
Czech Republic	112.5	115.0	115.8	112.3	108.9	107.3	111.0	100.7	99.4	92.7	93.2	-14.4%
Denmark	90.2	92.4	102.2	102.4	92.4	96.1	85.2	77.6	75.4	63.9	57.4	-37.9%
Estonia	..	..	..	..	146.8	140.9	134.2	131.8	150.3	153.9	130.5	-11.1%
Finland	58.6	60.7	67.7	60.7	57.6	59.5	53.3	51.8	56.0	44.0	41.3	-28.3%
France	80.5	78.1	76.9	61.4	57.6	53.8	53.3	52.7	50.4	46.6	46.9	-18.6%
Germany	107.1	102.7	100.7	96.6	93.3	87.7	83.9	81.5	79.2	79.9	79.2	-15.1%
Greece	88.6	99.9	100.8	109.0	115.2	119.1	113.9	109.4	102.6	101.7	94.1	-18.3%
Hungary	97.3	94.8	91.5	86.7	75.8	77.9	73.9	65.4	59.4	53.8	53.8	-29.1%
Iceland	39.7	36.8	32.5	27.4	33.3	32.4	29.2	27.8	18.4	17.8	17.2	-48.5%
Ireland	102.9	101.5	97.5	97.8	95.2	96.2	90.7	86.7	82.0	79.8	80.4	-15.6%
Italy	80.1	81.4	83.0	81.1	80.9	79.5	77.9	77.1	70.0	65.5	66.3	-18.1%
Latvia	..	..	..	..	69.9	55.1	49.5	44.6	47.4	41.5	43.1	-38.3%
Luxembourg	160.1	119.4	109.6	101.3	92.3	70.2	59.1	67.0	64.6	60.8	58.8	-36.3%
Netherlands	81.1	68.8	63.9	65.4	64.6	66.8	64.3	61.8	61.5	62.5	65.9	1.9%
Norway	44.2	42.1	40.7	36.5	37.6	40.4	38.4	40.3	42.0	41.9	42.7	13.5%
Poland	122.8	121.4	127.4	130.5	134.1	123.4	119.8	114.5	105.0	102.2	102.0	-23.9%
Portugal	68.2	70.2	71.7	64.5	67.6	74.2	71.4	71.6	59.9	63.2	69.1	2.2%
Slovak Republic	94.8	88.6	102.3	100.0	83.1	89.7	77.1	76.0	72.2	71.5	70.1	-15.7%
Slovenia	..	..	..	..	87.6	80.7	72.3	71.5	70.7	64.7	64.0	-26.9%
Spain	86.7	92.6	92.4	87.1	79.8	79.1	77.8	78.1	67.8	70.5	74.0	-7.4%
Sweden	60.2	54.0	50.5	42.7	38.7	38.0	35.2	33.9	31.5	27.9	27.4	-29.1%
Switzerland	61.2	59.8	56.4	55.9	53.1	52.9	51.8	51.4	49.7	48.5	47.1	-11.4%
Turkey	61.6	64.4	64.9	73.8	75.8	76.2	83.1	78.9	81.5	85.6	81.0	6.9%
United Kingdom	110.3	103.3	103.8	97.4	95.0	85.3	82.5	85.4	82.4	79.3	74.3	-21.8%
OECD Europe ²	94.2	90.8	90.6	86.1	82.6	78.4	75.6	74.2	70.8	69.1	68.5	-17.1%
<i>IEA/Accession/Association</i>	80.3	80.2	80.2	79.0	80.4	81.4	82.1	85.9	88.7	89.3	88.0	9.5%
<i>European Union - 28</i>	..	..	..	..	84.7	80.3	76.6	75.4	71.4	69.0	68.7	-18.9%
<i>G20</i>	..	..	..	..	80.8	81.3	82.1	85.8	87.8	88.3	87.1	7.8%
<i>Africa</i>	37.3	42.2	43.5	44.7	43.3	42.4	42.6	46.8	46.8	47.9	47.5	9.8%
<i>Americas</i>	79.1	79.5	78.3	77.9	80.5	79.9	80.3	80.1	77.5	75.4	74.0	-8.0%
<i>Asia</i>	..	..	..	..	73.3	78.9	81.8	89.4	95.1	96.9	95.8	30.7%
<i>Europe</i>	..	..	..	..	85.3	81.1	78.9	77.8	74.4	71.8	71.3	-16.4%
<i>Oceania</i>	88.4	95.9	97.0	97.5	99.0	97.9	103.1	112.1	110.2	100.3	101.8	2.8%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / TFCtonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	64.3	67.2	69.8	69.9	71.6	73.3	75.1	81.6	85.8	87.1	86.3	20.6%
Albania	65.2	62.4	60.4	71.9	62.2	45.1	47.9	47.2	47.0	46.2	45.1	-27.6%
Armenia	..	..	..	..	73.2	70.1	73.8	57.5	53.0	62.3	54.1	-26.1%
Azerbaijan	..	..	..	..	76.5	81.1	99.8	86.0	81.2	85.1	84.4	10.3%
Belarus	..	..	..	..	69.2	74.4	69.5	69.5	72.7	67.4	69.4	0.3%
Bosnia and Herzegovina	..	..	..	..	117.1	63.2	145.1	145.0	152.0	122.8	121.6	3.8%
Bulgaria	103.7	103.6	103.6	104.8	101.9	105.6	105.6	107.1	116.3	106.1	105.0	3.1%
Croatia	..	..	..	..	69.0	58.7	60.7	60.6	56.4	54.1	52.8	-23.4%
Cyprus ¹	95.2	102.0	100.6	102.1	105.9	100.1	104.5	106.0	101.1	99.3	98.5	-7.0%
FYR of Macedonia	..	..	..	..	136.1	134.1	129.8	119.8	109.5	96.4	89.8	-34.0%
Georgia	..	..	..	..	89.1	86.5	48.2	43.8	44.8	46.9	48.9	-45.2%
Gibraltar	63.7	59.6	88.0	79.3	74.7	75.4	74.9	74.9	77.4	77.5	78.2	4.7%
Kazakhstan	..	..	..	..	95.0	101.0	123.8	122.5	136.2	143.4	140.0	47.3%
Kosovo	..	..	..	..	..	..	159.2	161.8	175.0	140.4	148.8	..
Kyrgyzstan	..	..	..	..	78.7	59.8	62.3	63.5	63.5	64.3	70.3	-10.8%
Lithuania	..	..	..	..	73.9	62.9	55.5	55.6	54.4	43.1	42.8	-42.1%
Malta	123.3	127.6	145.2	210.9	207.4	150.5	160.1	210.2	149.8	128.2	85.0	-59.0%
Republic of Moldova	..	..	..	..	109.1	91.1	97.6	77.7	78.0	73.6	77.6	-28.9%
Montenegro	..	..	..	..	..	..	..	62.8	81.8	80.8	81.7	..
Romania	84.0	83.1	73.2	85.9	93.4	104.8	86.6	85.4	76.5	71.4	73.7	-21.1%
Russian Federation	..	..	..	..	82.7	80.7	84.3	85.9	81.8	77.4	76.8	-7.1%
Serbia	..	..	..	..	122.1	172.2	143.8	121.6	115.8	112.1	125.3	2.6%
Tajikistan	..	..	..	..	56.2	30.3	28.9	28.8	28.1	42.0	43.5	-22.6%
Turkmenistan	..	..	..	..	85.4	89.2	94.9	95.5	93.6	89.8	91.7	7.4%
Ukraine	..	..	..	..	109.5	101.9	97.4	84.8	86.0	91.3	89.0	-18.7%
Uzbekistan	..	..	..	..	78.5	68.8	72.5	74.9	74.7	75.9	77.6	-1.1%
Former Soviet Union ¹	92.4	91.8	91.3	88.8	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	88.3	92.5	98.4	119.1	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	92.1	91.6	90.5	89.7	87.8	85.6	87.0	86.8	85.2	82.3	81.9	-6.7%
Algeria	96.5	98.7	112.6	111.1	96.0	99.0	95.4	89.8	86.3	83.8	83.1	-13.5%
Angola	13.3	15.2	18.6	17.6	20.7	19.0	20.0	22.3	37.0	40.1	40.8	97.3%
Benin	7.5	10.1	8.0	8.4	4.3	3.3	20.4	28.3	36.1	33.9	35.2	726.3%
Botswana	..	..	..	48.4	75.3	70.6	68.4	68.5	46.6	87.2	87.0	15.6%
Cameroon	6.8	8.4	11.5	13.4	13.3	11.2	11.2	10.2	20.7	20.3	21.0	58.0%
Congo	32.2	31.6	32.4	30.6	24.8	21.5	24.6	26.7	34.9	31.2	31.2	25.9%
Côte d'Ivoire	33.9	35.7	32.7	28.6	22.2	23.7	34.9	27.5	26.1	28.1	34.0	53.1%
Dem. Rep. of the Congo	9.7	8.9	9.3	8.3	6.7	2.3	1.5	1.9	2.3	5.2	3.0	-54.9%
Egypt	70.2	72.7	73.2	79.9	80.1	77.2	75.7	82.1	79.4	86.0	85.9	7.1%
Eritrea	..	..	..	..	..	25.1	27.6	29.0	23.4	25.6	25.8	..
Ethiopia	2.8	2.3	2.4	2.1	2.8	2.5	3.0	3.6	4.1	6.1	6.0	111.9%
Gabon	18.3	23.7	30.6	32.9	21.5	25.3	25.8	14.8	13.2	16.7	16.4	-24.0%
Ghana	17.7	17.9	15.3	14.4	14.0	14.8	22.1	32.0	46.5	46.8	48.4	245.1%
Kenya	20.7	19.4	20.0	17.5	17.7	16.2	19.7	16.9	20.7	20.0	21.4	20.9%
Libya	114.3	107.0	105.3	102.3	112.3	100.5	93.5	98.7	86.7	122.5	130.3	16.0%
Mauritius	18.1	27.1	35.3	38.4	52.5	61.8	89.5	98.5	117.7	118.1	114.4	117.9%
Morocco	58.1	70.1	73.6	81.5	83.1	88.4	82.6	83.0	83.3	87.5	87.8	5.6%
Mozambique	12.9	10.8	10.6	7.2	5.4	5.4	4.8	4.6	6.3	9.0	11.6	112.5%
Namibia	..	..	..	..	..	48.6	47.8	49.2	52.3	51.9	52.7	..
Niger	..	..	..	..	..	..	11.3	10.8	15.7	17.7	17.4	..
Nigeria	4.3	7.0	13.2	14.5	11.3	11.6	13.3	14.4	12.6	12.3	12.8	13.0%
Senegal	35.6	43.9	46.4	47.8	47.1	49.3	57.2	64.1	51.0	56.2	57.0	21.1%
South Africa	113.0	121.7	113.8	116.5	114.1	118.7	119.5	138.3	142.4	139.4	136.5	19.7%
South Sudan	..	..	..	..	..	..	..	..	..	68.0	60.4	..
Sudan	20.2	18.8	18.8	18.0	20.8	16.0	17.5	25.3	30.7	30.9	34.5	65.5%
United Rep. of Tanzania	5.0	4.9	5.0	4.5	4.6	6.1	5.2	8.1	8.2	11.5	12.4	170.8%
Togo	17.3	14.8	14.8	11.0	16.2	14.2	17.7	15.8	24.4	19.9	20.2	24.4%
Tunisia	69.3	70.7	80.0	78.2	79.9	76.3	76.4	69.4	74.9	78.2	77.6	-2.9%
Zambia	27.9	29.5	21.5	16.4	14.2	10.3	7.9	8.6	5.9	9.5	9.5	-32.7%
Zimbabwe	35.0	31.1	31.2	34.6	48.8	44.9	36.7	30.3	26.1	29.1	29.6	-39.3%
Other Africa	9.0	9.4	11.5	8.8	7.6	7.8	9.1	9.8	11.3	12.8	12.7	66.3%
Africa	37.3	42.2	43.5	44.7	43.3	42.4	42.6	46.8	46.8	47.9	47.5	9.8%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / TFCtonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	12.8	16.5	20.2	21.3	25.1	29.3	33.0	41.7	52.2	58.7	60.3	140.4%
Brunei Darussalam	97.6	328.0	297.0	250.2	221.7	202.0	183.8	183.2	124.9	111.3	145.4	-34.4%
Cambodia	..	..	..	..	..	13.8	15.9	22.0	24.2	26.5	32.3	..
DPR of Korea	101.6	103.6	102.7	103.3	102.6	98.3	99.3	98.7	92.2	84.2	81.8	-20.3%
India	31.5	34.0	36.1	44.0	52.1	60.7	67.4	71.4	79.2	86.7	85.4	64.0%
Indonesia	18.8	24.0	32.5	34.9	40.0	49.0	50.7	57.3	60.9	64.1	64.8	62.0%
Malaysia	66.1	71.9	79.1	83.0	85.1	84.3	92.3	97.9	106.7	98.8	102.1	19.9%
Mongolia	..	..	..	117.1	109.8	136.3	146.3	131.2	126.4	131.4	131.7	20.0%
Myanmar	15.1	12.5	14.5	14.5	9.9	15.2	19.3	19.6	15.1	29.2	32.8	230.2%
Nepal	1.2	1.9	2.7	2.6	3.7	6.3	9.2	8.1	9.7	12.0	11.6	211.8%
Pakistan	24.2	25.8	25.8	30.2	36.9	42.6	44.1	44.0	44.1	44.6	44.9	21.6%
Philippines	43.4	45.9	48.1	42.9	46.2	59.3	68.0	74.9	77.7	84.7	83.8	81.3%
Singapore	132.1	135.4	142.0	108.9	138.1	148.0	121.0	67.2	68.4	62.4	62.0	-55.1%
Sri Lanka	18.2	16.0	20.2	17.3	16.6	22.9	34.1	39.7	33.7	43.9	46.8	182.9%
Chinese Taipei	97.4	93.7	92.1	79.7	90.2	94.0	105.1	100.2	90.2	87.7	86.9	-3.7%
Thailand	40.5	39.6	53.1	57.1	66.9	75.3	71.9	68.4	62.9	60.3	60.3	-9.9%
Viet Nam	31.2	31.0	27.2	29.2	25.9	32.8	42.1	53.8	62.4	62.4	69.1	167.2%
Other non-OECD Asia	44.9	48.8	55.1	42.5	40.8	37.0	38.2	47.3	49.9	52.3	50.8	24.5%
Asia (excl. China)	36.3	39.0	43.6	47.7	53.5	60.1	64.7	67.6	71.4	75.1	75.1	40.3%
People's Rep. of China	55.3	60.0	66.8	69.0	75.8	88.3	94.4	108.1	116.6	115.5	113.3	49.5%
Hong Kong, China	104.1	108.9	120.0	144.5	152.3	126.9	102.7	132.3	122.4	127.6	117.0	-23.2%
China	55.7	60.3	67.2	69.5	76.4	88.6	94.5	108.2	116.6	115.6	113.3	48.4%
Argentina	84.8	81.5	77.6	72.0	78.9	67.8	70.5	70.2	73.2	73.3	73.9	-6.3%
Bolivia	60.9	61.9	51.2	49.0	57.0	60.4	59.1	63.5	66.2	66.7	65.0	14.1%
Brazil	33.4	38.9	41.8	36.8	39.5	42.1	45.5	43.2	42.0	48.9	47.5	20.1%
Colombia	54.7	54.4	57.8	59.4	57.8	57.7	61.3	59.0	64.1	67.8	66.6	15.2%
Costa Rica	44.2	47.9	45.1	39.2	42.4	54.5	47.4	43.7	45.3	48.7	44.7	5.6%
Cuba	56.0	60.8	65.2	65.1	58.5	70.1	67.3	86.6	100.5	94.5	95.7	63.7%
Curaçao ¹	163.0	155.9	189.8	122.4	101.5	81.4	154.6	154.8	106.1	164.4	167.9	65.4%
Dominican Republic	46.5	60.5	64.5	70.3	74.4	84.1	88.1	84.3	83.2	87.7	89.2	19.9%
Ecuador	39.3	52.5	62.5	56.4	57.0	67.8	64.4	70.9	75.8	74.2	73.6	29.2%
El Salvador	18.9	23.7	18.5	17.9	24.8	41.8	41.2	45.2	58.0	61.0	62.1	150.2%
Guatemala	22.5	23.4	30.5	22.5	19.0	29.2	34.3	40.1	29.5	37.0	35.1	85.2%
Haiti	7.2	6.9	8.7	12.4	18.1	15.9	19.3	17.7	17.2	21.1	23.4	29.8%
Honduras	20.4	21.4	22.7	20.5	22.3	33.4	39.4	47.8	44.0	49.4	46.5	108.9%
Jamaica	92.3	80.9	87.1	90.5	88.4	121.5	108.1	88.0	89.6	82.9	83.9	-5.1%
Nicaragua	33.1	34.3	32.3	28.5	30.0	37.3	44.4	48.5	49.8	46.1	48.7	62.7%
Panama	74.5	78.1	61.7	53.3	49.6	61.8	58.6	65.5	73.7	73.7	72.8	46.8%
Paraguay	10.6	12.1	16.3	15.7	15.7	22.3	21.5	22.6	25.7	26.5	27.5	74.9%
Peru	46.6	49.3	53.2	47.7	53.4	58.4	59.4	62.3	65.0	67.1	65.4	22.5%
Suriname	..	..	..	..	..	..	63.9	82.5	72.5	79.2	82.1	..
Trinidad and Tobago	145.3	94.9	86.6	54.0	50.8	48.0	33.4	36.9	38.1	40.4	39.5	-22.2%
Uruguay	63.5	67.0	60.2	41.0	44.5	46.5	48.4	51.6	39.2	35.7	34.0	-23.7%
Venezuela	115.4	93.6	92.1	86.1	86.3	79.8	84.3	80.3	83.5	84.1	87.6	1.6%
Other non-OECD Americas	64.5	69.2	66.9	62.9	62.2	63.9	61.5	61.8	68.0	73.1	73.1	17.5%
Non-OECD Americas	54.4	54.6	56.3	51.3	53.2	54.2	56.3	55.3	55.5	58.9	58.1	9.4%
Bahrain	235.8	112.7	136.0	151.0	121.8	123.2	123.9	116.1	119.3	115.8	114.2	-6.3%
Islamic Republic of Iran	74.7	74.8	76.6	78.3	74.7	74.9	78.7	78.7	75.2	73.3	75.1	0.5%
Iraq	95.9	86.6	80.6	80.6	82.1	131.0	88.9	95.0	129.9	156.0	174.6	112.7%
Jordan	84.2	85.6	88.5	97.5	95.4	99.6	96.0	93.5	98.8	109.4	102.4	7.3%
Kuwait	98.4	103.3	100.9	108.1	168.0	109.7	135.7	127.0	122.2	111.3	115.8	-31.1%
Lebanon	77.2	83.7	107.3	96.9	115.9	84.9	101.3	97.8	112.7	111.9	111.0	-4.3%
Oman	75.0	84.8	97.4	97.3	131.7	138.7	159.9	120.7	82.5	76.6	75.2	-42.9%
Qatar	117.1	111.6	87.0	70.6	78.7	93.9	87.3	93.7	103.1	99.5	97.4	23.8%
Saudi Arabia	145.5	136.2	112.3	105.1	91.4	89.6	88.2	85.3	83.0	85.4	87.5	-4.3%
Syrian Arab Republic	77.9	71.7	76.4	78.3	85.5	89.7	86.4	92.2	98.7	92.5	95.0	11.1%
United Arab Emirates	61.0	72.9	82.5	79.9	76.5	77.2	82.8	95.8	81.7	82.2	81.0	5.8%
Yemen	89.3	81.6	83.6	87.2	83.0	88.4	96.1	90.7	99.7	91.9	104.0	25.3%
Middle East	88.3	86.2	91.0	88.3	85.2	88.0	87.3	87.6	85.7	85.9	87.4	2.5%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / GDP using exchange rateskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	0.69	0.66	0.63	0.57	0.54	0.51	0.46	0.47	0.46	0.44	0.43	-20.8%
<i>Annex I Parties</i>	..	..	..	..	0.45	0.40	0.36	0.33	0.30	0.27	0.26	-43.1%
<i>Annex II Parties</i>	0.57	0.52	0.47	0.40	0.35	0.33	0.31	0.29	0.26	0.23	0.22	-36.8%
<i>North America</i>	0.84	0.78	0.69	0.57	0.52	0.48	0.44	0.39	0.35	0.32	0.30	-41.8%
<i>Europe</i>	0.43	0.39	0.36	0.31	0.27	0.24	0.22	0.20	0.18	0.15	0.15	-43.1%
<i>Asia Oceania</i>	0.37	0.36	0.31	0.26	0.24	0.24	0.23	0.23	0.21	0.21	0.20	-16.4%
<i>Annex I EIT</i>	..	..	..	..	1.53	1.52	1.22	0.95	0.81	0.70	0.69	-54.8%
<i>Non-Annex I Parties</i>	..	..	..	..	0.79	0.78	0.72	0.77	0.74	0.70	0.68	-14.3%
<i>Annex B Kyoto Parties</i>	..	..	..	..	0.40	0.33	0.28	0.26	0.24	0.20	0.20	-50.1%
Non-OECD Total	0.98	0.99	0.99	1.00	1.03	0.95	0.84	0.85	0.80	0.75	0.73	-29.6%
OECD Total	0.59	0.54	0.49	0.42	0.38	0.35	0.33	0.30	0.28	0.25	0.24	-36.0%
Canada	0.62	0.58	0.54	0.44	0.41	0.41	0.38	0.36	0.33	0.31	0.31	-26.1%
Chile	0.49	0.46	0.41	0.36	0.39	0.32	0.34	0.30	0.32	0.29	0.31	-19.6%
Mexico	0.33	0.36	0.40	0.42	0.42	0.44	0.41	0.43	0.42	0.37	0.37	-11.9%
United States	0.87	0.80	0.70	0.59	0.53	0.49	0.44	0.40	0.36	0.32	0.30	-43.2%
OECD Americas	0.82	0.75	0.67	0.56	0.51	0.48	0.44	0.39	0.36	0.32	0.31	-40.2%
Australia	0.37	0.42	0.41	0.38	0.39	0.36	0.35	0.33	0.30	0.26	0.26	-33.5%
Israel ²	0.31	0.29	0.29	0.32	0.34	0.34	0.32	0.31	0.29	0.23	0.22	-34.9%
Japan	0.37	0.35	0.29	0.24	0.22	0.22	0.21	0.21	0.20	0.20	0.19	-14.3%
Korea	0.82	0.83	0.89	0.71	0.64	0.66	0.61	0.51	0.50	0.46	0.46	-27.5%
New Zealand	0.23	0.24	0.24	0.23	0.26	0.25	0.26	0.25	0.21	0.19	0.19	-29.2%
OECD Asia Oceania	0.38	0.37	0.33	0.28	0.27	0.27	0.27	0.26	0.25	0.25	0.24	-11.0%
Austria	0.32	0.28	0.26	0.24	0.22	0.21	0.18	0.20	0.18	0.15	0.15	-30.4%
Belgium	0.58	0.50	0.46	0.36	0.32	0.31	0.28	0.24	0.21	0.17	0.18	-43.4%
Czech Republic	1.54	1.36	1.33	1.32	1.04	0.89	0.80	0.65	0.54	0.46	0.44	-57.3%
Denmark	0.36	0.32	0.34	0.29	0.22	0.23	0.17	0.15	0.15	0.10	0.09	-57.8%
Estonia	..	..	..	..	2.40	1.52	1.03	0.85	0.96	0.81	0.67	-72.1%
Finland	0.46	0.42	0.45	0.34	0.32	0.34	0.26	0.23	0.25	0.18	0.17	-47.3%
France	0.38	0.33	0.31	0.22	0.18	0.17	0.16	0.15	0.13	0.10	0.10	-42.2%
Germany	0.62	0.56	0.51	0.46	0.37	0.30	0.26	0.24	0.22	0.20	0.20	-46.1%
Greece	0.20	0.23	0.24	0.29	0.35	0.36	0.35	0.31	0.28	0.27	0.26	-25.3%
Hungary	0.99	0.90	0.89	0.79	0.63	0.61	0.50	0.42	0.36	0.29	0.30	-53.0%
Iceland	0.38	0.36	0.29	0.24	0.24	0.24	0.21	0.18	0.15	0.14	0.14	-43.0%
Ireland	0.57	0.46	0.45	0.40	0.36	0.31	0.25	0.20	0.18	0.14	0.12	-68.0%
Italy	0.30	0.29	0.26	0.23	0.22	0.21	0.20	0.21	0.18	0.16	0.16	-27.9%
Latvia	..	..	..	..	..	0.70	0.42	0.31	0.34	0.24	0.24	..
Luxembourg	1.39	0.96	0.84	0.61	0.45	0.27	0.20	0.24	0.20	0.16	0.14	-68.2%
Netherlands	0.39	0.36	0.34	0.31	0.28	0.28	0.22	0.21	0.20	0.17	0.18	-35.5%
Norway	0.17	0.15	0.14	0.11	0.11	0.10	0.09	0.08	0.09	0.08	0.08	-26.4%
Poland	1.68	1.55	1.82	1.84	1.52	1.32	0.89	0.78	0.64	0.52	0.51	-66.6%
Portugal	0.18	0.19	0.20	0.19	0.23	0.26	0.26	0.27	0.20	0.19	0.21	-9.1%
Slovak Republic	1.12	1.09	1.26	1.14	1.07	0.88	0.66	0.52	0.39	0.30	0.29	-72.9%
Slovenia	..	..	..	..	0.44	0.47	0.38	0.35	0.32	0.27	0.26	-40.4%
Spain	0.25	0.26	0.28	0.25	0.23	0.24	0.24	0.25	0.18	0.17	0.17	-24.7%
Sweden	0.38	0.33	0.28	0.20	0.16	0.17	0.13	0.11	0.09	0.07	0.07	-57.7%
Switzerland	0.12	0.12	0.11	0.11	0.10	0.10	0.09	0.08	0.07	0.06	0.06	-37.3%
Turkey	0.27	0.31	0.33	0.34	0.35	0.36	0.39	0.33	0.34	0.30	0.29	-16.7%
United Kingdom	0.60	0.52	0.46	0.39	0.34	0.29	0.25	0.22	0.20	0.16	0.15	-56.6%
OECD Europe ²	0.48	0.44	0.41	0.36	0.31	0.28	0.25	0.23	0.21	0.18	0.18	-43.5%
<i>IEA/Accession/Association</i>	0.63	0.59	0.55	0.48	0.44	0.44	0.40	0.41	0.41	0.40	0.38	-13.8%
<i>European Union - 28</i>	..	..	..	..	0.34	0.30	0.26	0.24	0.21	0.18	0.18	-47.2%
<i>G20</i>	..	..	..	..	0.50	0.47	0.43	0.43	0.43	0.41	0.40	-19.2%
<i>Africa</i>	0.44	0.50	0.50	0.55	0.57	0.59	0.57	0.57	0.51	0.50	0.49	-13.4%
<i>Americas</i>	0.73	0.67	0.59	0.51	0.47	0.44	0.41	0.37	0.34	0.31	0.30	-36.8%
<i>Asia</i>	..	..	..	..	0.65	0.67	0.63	0.69	0.71	0.68	0.66	1.6%
<i>Europe</i>	..	..	..	..	0.50	0.41	0.34	0.32	0.28	0.25	0.24	-51.6%
<i>Oceania</i>	0.35	0.39	0.39	0.36	0.37	0.35	0.34	0.32	0.29	0.25	0.25	-32.1%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / GDP using exchange rateskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	0.98	0.99	0.99	1.00	1.03	0.95	0.84	0.85	0.80	0.75	0.73	-29.6%
Albania	1.17	1.05	1.25	1.15	0.92	0.34	0.44	0.41	0.33	0.32	0.29	-68.3%
Armenia	..	..	..	..	3.12	1.00	0.79	0.54	0.44	0.47	0.41	-86.9%
Azerbaijan	..	..	..	..	2.39	3.46	2.08	1.17	0.44	0.53	0.52	-78.2%
Belarus	..	..	..	..	3.27	2.86	1.93	1.42	1.08	0.94	0.91	-72.2%
Bosnia and Herzegovina	..	..	..	..	7.07	0.99	1.21	1.06	1.19	1.22	1.22	-82.8%
Bulgaria	4.11	3.46	2.98	2.44	2.05	1.66	1.29	1.07	0.88	0.79	0.80	-61.0%
Croatia	..	..	..	..	0.35	0.37	0.36	0.34	0.31	0.26	0.27	-24.1%
Cyprus ¹	0.54	0.43	0.38	0.32	0.32	0.32	0.33	0.31	0.28	0.25	0.25	-20.4%
FYR of Macedonia	..	..	..	..	1.12	1.37	1.22	1.15	0.89	0.73	0.68	-38.8%
Georgia	..	..	..	..	1.98	1.70	0.73	0.45	0.43	0.54	0.57	-71.2%
Gibraltar	0.15	0.12	0.17	0.15	0.20	0.36	0.37	0.39	0.45	0.47	0.49	146.5%
Kazakhstan	..	..	..	..	2.46	2.88	1.68	1.43	1.49	1.25	1.21	-50.9%
Kosovo	..	..	..	..	..	..	1.57	1.40	1.49	1.13	1.26	..
Kyrgyzstan	..	..	..	..	4.73	1.83	1.39	1.27	1.26	1.54	1.63	-65.5%
Lithuania	..	..	..	..	1.19	0.70	0.42	0.36	0.33	0.24	0.24	-80.1%
Malta	0.56	0.39	0.34	0.37	0.54	0.43	0.30	0.34	0.30	0.24	0.16	-71.2%
Republic of Moldova	..	..	..	..	3.09	2.98	1.85	1.55	1.35	1.03	1.08	-65.1%
Montenegro	..	..	..	..	..	..	..	0.60	0.63	0.51	0.52	..
Romania	2.15	1.74	1.52	1.29	1.36	1.06	0.78	0.64	0.45	0.37	0.37	-72.9%
Russian Federation	..	..	..	..	1.43	1.65	1.45	1.08	0.94	0.83	0.85	-40.5%
Serbia	..	..	..	..	2.52	1.86	1.68	1.43	1.16	0.96	1.11	-56.1%
Tajikistan	..	..	..	..	1.63	0.96	0.85	0.57	0.41	0.54	0.55	-66.5%
Turkmenistan	..	..	..	..	3.26	3.85	3.41	3.49	2.52	1.92	1.85	-43.2%
Ukraine	..	..	..	..	3.35	4.01	3.30	2.27	1.96	1.75	1.56	-53.2%
Uzbekistan	..	..	..	..	5.62	5.70	5.68	4.11	2.47	1.82	1.64	-70.7%
Former Soviet Union ¹	1.82	1.86	1.80	1.70	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	0.73	0.71	0.60	0.84	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	1.78	1.79	1.71	1.62	1.74	1.84	1.52	1.16	0.99	0.87	0.87	-50.2%
Algeria	0.25	0.26	0.40	0.47	0.56	0.59	0.56	0.54	0.59	0.67	0.69	23.5%
Angola	0.07	0.08	0.11	0.10	0.12	0.15	0.13	0.13	0.18	0.19	0.20	60.4%
Benin	0.18	0.26	0.18	0.17	0.08	0.06	0.30	0.46	0.66	0.56	0.60	615.9%
Botswana	..	..	..	0.49	0.53	0.48	0.47	0.42	0.26	0.43	0.44	-16.6%
Cameroon	0.12	0.13	0.16	0.14	0.18	0.18	0.16	0.14	0.21	0.20	0.20	11.4%
Congo	0.24	0.19	0.17	0.11	0.10	0.08	0.07	0.09	0.15	0.19	0.18	91.6%
Côte d'Ivoire	0.22	0.23	0.20	0.18	0.15	0.17	0.28	0.26	0.25	0.29	0.28	86.8%
Dem. Rep. of the Congo	0.12	0.11	0.15	0.14	0.13	0.07	0.07	0.08	0.09	0.17	0.09	-28.8%
Egypt	0.70	0.78	0.77	0.88	0.87	0.77	0.73	0.89	0.81	0.81	0.80	-7.7%
Eritrea	..	..	..	..	..	0.47	0.32	0.26	0.23	0.22	0.22	..
Ethiopia	0.17	0.15	0.16	0.18	0.22	0.22	0.24	0.25	0.20	0.23	0.21	-3.1%
Gabon	0.10	0.08	0.15	0.17	0.09	0.11	0.12	0.13	0.18	0.18	0.17	103.6%
Ghana	0.19	0.25	0.22	0.22	0.21	0.22	0.27	0.27	0.32	0.29	0.30	43.4%
Kenya	0.39	0.32	0.30	0.28	0.25	0.24	0.30	0.24	0.28	0.25	0.27	6.9%
Libya	0.07	0.19	0.24	0.41	0.55	0.73	0.77	0.70	0.64	1.26	1.32	140.5%
Mauritius	0.20	0.25	0.26	0.22	0.30	0.31	0.37	0.39	0.37	0.34	0.33	11.9%
Morocco	0.38	0.46	0.50	0.49	0.46	0.55	0.51	0.54	0.50	0.49	0.49	6.6%
Mozambique	1.12	1.08	1.04	0.86	0.47	0.43	0.28	0.21	0.23	0.29	0.35	-25.5%
Namibia	..	..	..	..	..	0.30	0.27	0.28	0.27	0.26	0.26	..
Niger	..	..	..	..	..	..	0.18	0.17	0.24	0.27	0.26	..
Nigeria	0.06	0.09	0.18	0.26	0.22	0.25	0.28	0.22	0.15	0.13	0.14	-35.2%
Senegal	0.29	0.34	0.41	0.37	0.33	0.35	0.41	0.43	0.42	0.42	0.42	26.1%
South Africa	1.09	1.23	1.09	1.09	1.09	1.12	1.05	1.16	1.08	1.05	1.02	-6.3%
South Sudan	..	..	..	..	..	..	..	..	..	0.25	0.26	..
Sudan	0.29	0.23	0.24	0.25	0.27	0.17	0.16	0.21	0.23	0.19	0.21	-20.7%
United Rep. of Tanzania	0.23	0.19	0.18	0.16	0.14	0.19	0.16	0.22	0.20	0.25	0.27	94.6%
Togo	0.28	0.22	0.20	0.16	0.28	0.28	0.37	0.36	0.65	0.46	0.46	66.0%
Tunisia	0.53	0.51	0.61	0.61	0.66	0.63	0.61	0.55	0.53	0.53	0.53	-19.9%
Zambia	0.51	0.58	0.43	0.35	0.31	0.24	0.17	0.16	0.08	0.13	0.13	-58.5%
Zimbabwe	1.08	0.92	0.95	0.95	1.26	1.11	0.87	0.99	0.98	0.91	0.93	-26.7%
Other Africa	0.20	0.22	0.27	0.21	0.22	0.25	0.23	0.19	0.19	0.19	0.19	-11.5%
Africa	0.44	0.50	0.50	0.55	0.57	0.59	0.57	0.57	0.51	0.50	0.49	-13.4%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / GDP using exchange rateskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.12	0.19	0.23	0.22	0.27	0.31	0.31	0.37	0.43	0.43	0.45	67.1%
Brunei Darussalam	0.07	0.20	0.23	0.31	0.34	0.40	0.37	0.36	0.50	0.49	0.44	29.0%
Cambodia	..	..	..	..	..	0.40	0.38	0.32	0.41	0.41	0.50	..
DPR of Korea	8.35	6.05	4.83	3.61	2.74	2.28	2.35	2.61	1.84	1.08	0.84	-69.3%
India	0.87	0.92	0.95	1.06	1.12	1.17	1.10	0.96	0.96	0.95	0.90	-20.0%
Indonesia	0.27	0.31	0.37	0.37	0.43	0.47	0.56	0.56	0.50	0.46	0.45	3.5%
Malaysia	0.56	0.53	0.52	0.56	0.61	0.62	0.71	0.76	0.74	0.70	0.67	10.2%
Mongolia	..	..	..	3.67	3.34	3.06	2.34	2.09	1.97	1.57	1.47	-56.0%
Myanmar	0.66	0.52	0.49	0.44	0.34	0.43	0.40	0.25	0.13	0.24	0.28	-17.8%
Nepal	0.06	0.08	0.12	0.10	0.13	0.20	0.28	0.24	0.26	0.30	0.28	113.1%
Pakistan	0.57	0.62	0.56	0.61	0.70	0.79	0.80	0.77	0.73	0.69	0.68	-3.4%
Philippines	0.49	0.49	0.42	0.38	0.40	0.54	0.54	0.46	0.39	0.38	0.39	-2.9%
Singapore	0.40	0.40	0.39	0.37	0.43	0.37	0.31	0.22	0.19	0.16	0.15	-63.9%
Sri Lanka	0.31	0.25	0.26	0.20	0.18	0.20	0.31	0.32	0.22	0.23	0.26	43.3%
Chinese Taipei	0.94	0.85	0.87	0.69	0.72	0.69	0.72	0.70	0.57	0.50	0.49	-31.2%
Thailand	0.45	0.47	0.51	0.49	0.57	0.67	0.70	0.71	0.66	0.64	0.63	10.4%
Viet Nam	1.03	1.06	0.88	0.75	0.59	0.63	0.72	0.93	1.09	0.99	1.09	84.6%
Other non-OECD Asia	0.50	0.52	0.58	0.33	0.30	0.24	0.27	0.27	0.26	0.24	0.24	-19.0%
Asia (excl. China)	0.72	0.73	0.73	0.74	0.75	0.75	0.77	0.73	0.70	0.67	0.65	-13.4%
People's Rep. of China	3.90	4.14	4.00	2.87	2.50	1.95	1.38	1.50	1.26	1.08	1.01	-59.5%
Hong Kong, China	0.37	0.35	0.27	0.31	0.32	0.27	0.26	0.22	0.18	0.19	0.17	-48.1%
China	3.51	3.71	3.48	2.58	2.26	1.81	1.31	1.44	1.22	1.06	0.99	-56.2%
Argentina	0.46	0.43	0.42	0.44	0.51	0.44	0.46	0.45	0.41	0.42	0.42	-17.9%
Bolivia	0.33	0.39	0.46	0.52	0.55	0.61	0.53	0.58	0.70	0.75	0.71	28.7%
Brazil	0.18	0.18	0.17	0.15	0.15	0.16	0.19	0.17	0.17	0.20	0.19	25.2%
Colombia	0.41	0.35	0.33	0.34	0.31	0.30	0.28	0.23	0.21	0.21	0.20	-34.9%
Costa Rica	0.17	0.19	0.18	0.16	0.17	0.22	0.18	0.18	0.18	0.17	0.16	-8.9%
Cuba	0.98	0.95	1.02	0.71	0.76	0.72	0.71	0.51	0.51	0.42	0.40	-47.0%
Curacao ¹	13.74	8.53	6.31	3.09	1.55	1.37	2.40	2.39	1.64	2.53	2.63	69.4%
Dominican Republic	0.43	0.46	0.43	0.39	0.40	0.47	0.55	0.46	0.36	0.31	0.31	-22.4%
Ecuador	0.22	0.25	0.35	0.35	0.35	0.38	0.39	0.41	0.46	0.45	0.43	23.8%
El Salvador	0.13	0.16	0.14	0.16	0.19	0.30	0.29	0.31	0.27	0.26	0.27	47.2%
Guatemala	0.20	0.22	0.23	0.18	0.16	0.24	0.29	0.31	0.25	0.34	0.30	88.2%
Haiti	0.08	0.08	0.09	0.12	0.15	0.16	0.21	0.31	0.32	0.36	0.41	179.2%
Honduras	0.31	0.31	0.28	0.26	0.29	0.40	0.43	0.54	0.47	0.49	0.49	72.6%
Jamaica	0.63	0.79	0.82	0.58	0.70	0.67	0.79	0.76	0.53	0.53	0.51	-26.7%
Nicaragua	0.27	0.28	0.33	0.32	0.39	0.49	0.54	0.52	0.49	0.42	0.46	17.8%
Panama	0.44	0.48	0.34	0.26	0.26	0.31	0.30	0.33	0.31	0.27	0.25	-1.9%
Paraguay	0.17	0.16	0.18	0.17	0.17	0.25	0.23	0.22	0.23	0.21	0.22	30.6%
Peru	0.33	0.31	0.32	0.28	0.33	0.31	0.31	0.27	0.28	0.27	0.26	-19.4%
Suriname	..	..	..	..	..	..	0.54	0.47	0.39	0.40	0.42	..
Trinidad and Tobago	0.78	0.59	0.62	0.74	0.99	0.95	0.81	0.96	1.01	1.02	1.00	1.5%
Uruguay	0.32	0.31	0.25	0.17	0.17	0.17	0.17	0.17	0.15	0.13	0.13	-20.8%
Venezuela	0.27	0.29	0.38	0.41	0.40	0.38	0.40	0.42	0.44	0.37	0.34	-13.5%
Other non-OECD Americas	0.50	0.63	0.46	0.40	0.42	0.43	0.39	0.36	0.41	0.45	0.45	6.7%
Non-OECD Americas	0.30	0.28	0.27	0.26	0.26	0.26	0.28	0.27	0.26	0.26	0.26	-1.1%
Bahrain	1.15	1.12	0.95	1.28	1.20	1.09	1.04	1.05	0.99	0.99	0.98	-18.6%
Islamic Republic of Iran	0.21	0.28	0.54	0.72	0.83	1.03	1.11	1.13	1.07	1.20	1.19	42.9%
Iraq	0.67	0.72	0.57	0.93	0.74	2.03	0.69	0.70	0.75	0.78	0.71	-3.7%
Jordan	0.39	0.63	0.60	0.81	1.07	1.00	0.99	0.92	0.71	0.81	0.79	-26.5%
Kuwait	0.23	0.30	0.50	0.89	0.68	0.48	0.63	0.59	0.67	0.58	0.61	-10.6%
Lebanon	0.27	0.34	0.46	0.33	0.48	0.63	0.64	0.55	0.48	0.55	0.55	14.2%
Oman	0.04	0.08	0.20	0.24	0.38	0.41	0.48	0.57	0.72	0.88	0.90	138.4%
Qatar	0.12	0.25	0.31	0.56	0.66	0.79	0.59	0.62	0.46	0.49	0.48	-27.2%
Saudi Arabia	0.12	0.12	0.38	0.57	0.62	0.68	0.73	0.73	0.80	0.78	0.79	28.3%
Syrian Arab Republic	0.67	0.60	0.65	0.91	1.13	0.86	0.96	1.13	0.93	1.17	1.54	37.1%
United Arab Emirates	0.11	0.09	0.16	0.33	0.42	0.47	0.41	0.44	0.54	0.51	0.50	19.8%
Yemen	0.43	0.44	0.50	0.49	0.54	0.60	0.66	0.75	0.72	0.78	0.54	-0.1%
Middle East	0.22	0.25	0.41	0.62	0.67	0.79	0.76	0.78	0.79	0.80	0.79	17.6%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / GDP using purchasing power paritieskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	0.60	0.56	0.53	0.48	0.45	0.42	0.38	0.37	0.34	0.32	0.31	-31.4%
<i>Annex I Parties</i>	..	..	..	..	0.45	0.41	0.37	0.33	0.30	0.27	0.26	-42.7%
<i>Annex II Parties</i>	0.63	0.57	0.51	0.43	0.39	0.37	0.34	0.31	0.28	0.25	0.24	-37.0%
<i>North America</i>	0.86	0.79	0.70	0.58	0.53	0.49	0.44	0.40	0.36	0.32	0.31	-41.8%
<i>Europe</i>	0.47	0.42	0.39	0.33	0.29	0.26	0.23	0.22	0.20	0.17	0.17	-42.8%
<i>Asia Oceania</i>	0.48	0.47	0.40	0.33	0.32	0.32	0.31	0.30	0.28	0.28	0.27	-14.5%
<i>Annex I EIT</i>	..	..	..	..	0.84	0.85	0.69	0.54	0.46	0.40	0.39	-53.3%
<i>Non-Annex I Parties</i>	..	..	..	..	0.40	0.39	0.36	0.38	0.36	0.34	0.33	-17.6%
<i>Annex B Kyoto Parties</i>	..	..	..	..	0.40	0.34	0.29	0.27	0.24	0.21	0.20	-49.3%
Non-OECD Total	0.49	0.50	0.51	0.50	0.50	0.46	0.41	0.41	0.38	0.35	0.34	-32.6%
OECD Total	0.62	0.56	0.51	0.44	0.39	0.37	0.34	0.31	0.28	0.25	0.25	-37.4%
Canada	0.74	0.69	0.64	0.52	0.49	0.48	0.46	0.42	0.39	0.37	0.36	-26.1%
Chile	0.34	0.32	0.28	0.25	0.27	0.22	0.24	0.21	0.22	0.21	0.22	-19.6%
Mexico	0.20	0.22	0.24	0.26	0.25	0.27	0.25	0.26	0.25	0.22	0.22	-11.9%
United States	0.87	0.80	0.70	0.59	0.53	0.49	0.44	0.40	0.36	0.32	0.30	-43.2%
OECD Americas	0.80	0.73	0.65	0.55	0.50	0.47	0.42	0.38	0.35	0.31	0.30	-40.6%
Australia	0.51	0.57	0.57	0.52	0.53	0.50	0.48	0.45	0.41	0.36	0.35	-33.5%
Israel ²	0.33	0.31	0.30	0.34	0.37	0.36	0.34	0.33	0.31	0.24	0.24	-34.9%
Japan	0.49	0.46	0.38	0.31	0.29	0.29	0.29	0.28	0.26	0.27	0.26	-12.1%
Korea	0.60	0.60	0.65	0.51	0.46	0.48	0.44	0.37	0.37	0.33	0.34	-27.5%
New Zealand	0.25	0.25	0.25	0.25	0.28	0.27	0.28	0.27	0.22	0.21	0.20	-29.3%
OECD Asia Oceania	0.49	0.48	0.42	0.35	0.34	0.34	0.34	0.32	0.30	0.29	0.29	-14.7%
Austria	0.35	0.31	0.29	0.26	0.24	0.23	0.21	0.23	0.20	0.17	0.17	-30.3%
Belgium	0.65	0.55	0.51	0.39	0.36	0.34	0.30	0.26	0.24	0.19	0.20	-43.4%
Czech Republic	1.10	0.97	0.95	0.94	0.75	0.64	0.57	0.46	0.39	0.33	0.32	-57.4%
Denmark	0.48	0.43	0.46	0.39	0.30	0.31	0.23	0.20	0.20	0.14	0.13	-57.9%
Estonia	..	..	..	..	1.63	1.03	0.70	0.57	0.65	0.55	0.45	-72.1%
Finland	0.55	0.50	0.53	0.41	0.38	0.41	0.31	0.27	0.30	0.22	0.20	-47.2%
France	0.43	0.38	0.34	0.25	0.20	0.19	0.18	0.16	0.15	0.12	0.12	-42.2%
Germany	0.66	0.60	0.55	0.49	0.39	0.32	0.28	0.26	0.24	0.21	0.21	-46.1%
Greece	0.19	0.22	0.23	0.28	0.34	0.35	0.33	0.30	0.27	0.26	0.25	-25.3%
Hungary	0.60	0.55	0.54	0.48	0.38	0.37	0.30	0.25	0.22	0.18	0.18	-53.0%
Iceland	0.41	0.39	0.31	0.26	0.26	0.26	0.23	0.19	0.16	0.15	0.15	-43.1%
Ireland	0.64	0.51	0.50	0.45	0.41	0.35	0.28	0.23	0.20	0.16	0.13	-68.0%
Italy	0.31	0.29	0.26	0.23	0.23	0.22	0.21	0.22	0.19	0.16	0.16	-27.9%
Latvia	..	..	..	..	0.54	0.45	0.27	0.20	0.22	0.16	0.16	-70.9%
Luxembourg	1.70	1.17	1.02	0.75	0.54	0.33	0.24	0.30	0.24	0.19	0.17	-68.2%
Netherlands	0.44	0.40	0.39	0.35	0.31	0.31	0.25	0.24	0.23	0.20	0.20	-35.5%
Norway	0.26	0.22	0.21	0.17	0.16	0.15	0.13	0.13	0.13	0.12	0.12	-26.5%
Poland	1.00	0.93	1.09	1.10	0.91	0.79	0.53	0.47	0.38	0.31	0.30	-66.7%
Portugal	0.15	0.16	0.16	0.16	0.19	0.21	0.22	0.22	0.16	0.16	0.17	-9.1%
Slovak Republic	0.74	0.72	0.84	0.76	0.71	0.59	0.44	0.35	0.26	0.20	0.19	-72.9%
Slovenia	..	..	..	..	0.37	0.40	0.32	0.30	0.27	0.22	0.22	-40.4%
Spain	0.24	0.25	0.27	0.24	0.22	0.23	0.23	0.24	0.18	0.16	0.17	-24.8%
Sweden	0.48	0.41	0.35	0.26	0.20	0.21	0.16	0.14	0.12	0.09	0.09	-57.7%
Switzerland	0.17	0.16	0.16	0.16	0.13	0.13	0.12	0.12	0.10	0.09	0.08	-37.2%
Turkey	0.16	0.19	0.20	0.21	0.21	0.22	0.24	0.20	0.21	0.18	0.18	-16.7%
United Kingdom	0.65	0.57	0.50	0.43	0.36	0.31	0.27	0.24	0.21	0.17	0.16	-56.6%
OECD Europe ²	0.50	0.45	0.43	0.37	0.32	0.29	0.25	0.24	0.21	0.18	0.18	-44.7%
<i>IEA/Accession/Association</i>	0.62	0.58	0.54	0.47	0.43	0.41	0.37	0.36	0.35	0.32	0.31	-28.2%
<i>European Union - 28</i>	..	..	..	..	0.34	0.31	0.26	0.25	0.22	0.18	0.18	-47.4%
<i>G20</i>	..	..	..	..	0.45	0.42	0.38	0.37	0.35	0.32	0.31	-30.5%
<i>Africa</i>	0.20	0.23	0.23	0.25	0.25	0.26	0.24	0.25	0.22	0.22	0.21	-15.3%
<i>Americas</i>	0.67	0.60	0.53	0.46	0.43	0.41	0.38	0.34	0.31	0.28	0.27	-37.7%
<i>Asia</i>	..	..	..	..	0.44	0.43	0.39	0.41	0.39	0.37	0.35	-19.7%
<i>Europe</i>	..	..	..	..	0.46	0.39	0.33	0.30	0.27	0.23	0.23	-50.3%
<i>Oceania</i>	0.46	0.51	0.51	0.48	0.49	0.46	0.45	0.43	0.39	0.34	0.33	-32.0%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / GDP using purchasing power paritieskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	0.49	0.50	0.51	0.50	0.50	0.46	0.41	0.41	0.38	0.35	0.34	-32.6%
Albania	0.52	0.46	0.55	0.51	0.40	0.15	0.19	0.18	0.15	0.14	0.13	-68.3%
Armenia	..	..	..	..	1.53	0.49	0.39	0.26	0.21	0.23	0.20	-86.9%
Azerbaijan	..	..	..	..	0.90	1.29	0.78	0.44	0.17	0.20	0.20	-78.2%
Belarus	..	..	..	..	1.24	1.08	0.73	0.54	0.41	0.36	0.34	-72.2%
Bosnia and Herzegovina	..	..	..	..	3.54	0.49	0.61	0.53	0.60	0.61	0.61	-82.8%
Bulgaria	1.86	1.57	1.35	1.11	0.93	0.75	0.58	0.49	0.40	0.36	0.36	-61.0%
Croatia	..	..	..	..	0.25	0.27	0.26	0.24	0.22	0.19	0.19	-24.1%
Cyprus ¹	0.49	0.39	0.35	0.29	0.29	0.29	0.30	0.28	0.26	0.23	0.23	-20.4%
FYR of Macedonia	..	..	..	..	0.44	0.54	0.47	0.45	0.35	0.28	0.27	-38.8%
Georgia	..	..	..	..	0.89	0.76	0.33	0.20	0.19	0.24	0.26	-71.2%
Gibraltar	0.18	0.15	0.21	0.18	0.25	0.45	0.44	0.45	0.52	0.55	0.57	133.7%
Kazakhstan	..	..	..	..	1.09	1.27	0.74	0.63	0.66	0.55	0.53	-50.9%
Kosovo	..	..	..	..	..	..	0.66	0.59	0.63	0.48	0.53	..
Kyrgyzstan	..	..	..	..	1.52	0.59	0.45	0.41	0.41	0.50	0.53	-65.5%
Lithuania	..	..	..	..	0.71	0.41	0.25	0.21	0.20	0.14	0.14	-80.1%
Malta	0.45	0.31	0.27	0.29	0.43	0.34	0.24	0.27	0.23	0.19	0.12	-71.2%
Republic of Moldova	..	..	..	..	1.30	1.26	0.79	0.66	0.57	0.44	0.46	-65.0%
Montenegro	..	..	..	..	..	..	..	0.30	0.31	0.25	0.26	..
Romania	1.08	0.87	0.76	0.64	0.68	0.53	0.39	0.32	0.22	0.19	0.18	-72.9%
Russian Federation	..	..	..	..	0.80	0.92	0.81	0.60	0.52	0.46	0.47	-40.6%
Serbia	..	..	..	..	1.16	0.85	0.77	0.66	0.53	0.44	0.51	-56.1%
Tajikistan	..	..	..	..	0.58	0.34	0.30	0.20	0.15	0.19	0.20	-66.5%
Turkmenistan	..	..	..	..	1.49	1.75	1.55	1.59	1.15	0.87	0.85	-43.2%
Ukraine	..	..	..	..	1.29	1.55	1.27	0.88	0.76	0.67	0.60	-53.2%
Uzbekistan	..	..	..	..	1.89	1.91	1.91	1.38	0.83	0.61	0.55	-70.7%
Former Soviet Union ¹	1.01	1.03	1.00	0.94	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	0.45	0.44	0.37	0.52	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	0.99	0.99	0.94	0.89	0.90	0.95	0.79	0.60	0.51	0.45	0.44	-50.6%
Algeria	0.09	0.09	0.14	0.17	0.20	0.21	0.20	0.19	0.21	0.24	0.24	23.5%
Angola	0.04	0.05	0.07	0.06	0.07	0.09	0.08	0.08	0.11	0.12	0.12	60.4%
Benin	0.08	0.11	0.08	0.07	0.04	0.03	0.13	0.20	0.28	0.24	0.26	616.4%
Botswana	..	..	..	0.24	0.26	0.23	0.23	0.20	0.12	0.21	0.21	-16.6%
Cameroon	0.06	0.06	0.07	0.06	0.08	0.08	0.07	0.07	0.10	0.09	0.09	11.4%
Congo	0.13	0.10	0.09	0.06	0.05	0.04	0.04	0.05	0.08	0.10	0.10	91.5%
Côte d'Ivoire	0.10	0.10	0.09	0.08	0.07	0.08	0.13	0.12	0.12	0.13	0.13	86.9%
Dem. Rep. of the Congo	0.06	0.06	0.08	0.07	0.07	0.04	0.03	0.04	0.05	0.09	0.05	-28.8%
Egypt	0.19	0.21	0.21	0.24	0.23	0.21	0.20	0.24	0.22	0.22	0.22	-7.7%
Eritrea	..	..	..	..	..	0.16	0.11	0.09	0.08	0.08	0.08	..
Ethiopia	0.05	0.05	0.05	0.06	0.07	0.07	0.08	0.08	0.06	0.07	0.07	-3.3%
Gabon	0.06	0.05	0.08	0.10	0.05	0.06	0.07	0.07	0.11	0.11	0.10	103.6%
Ghana	0.08	0.11	0.10	0.10	0.09	0.09	0.12	0.12	0.14	0.13	0.13	43.3%
Kenya	0.16	0.13	0.12	0.11	0.10	0.10	0.12	0.10	0.11	0.10	0.11	6.8%
Libya	0.03	0.08	0.10	0.17	0.23	0.30	0.32	0.29	0.27	0.52	0.55	140.5%
Mauritius	0.11	0.13	0.14	0.12	0.16	0.16	0.19	0.20	0.19	0.18	0.17	11.9%
Morocco	0.17	0.21	0.23	0.22	0.20	0.25	0.23	0.24	0.22	0.22	0.22	6.6%
Mozambique	0.52	0.50	0.48	0.40	0.22	0.20	0.13	0.10	0.11	0.13	0.16	-25.5%
Namibia	..	..	..	..	..	0.19	0.17	0.17	0.17	0.16	0.16	..
Niger	..	..	..	..	..	..	0.08	0.07	0.10	0.12	0.11	..
Nigeria	0.03	0.04	0.08	0.12	0.10	0.11	0.13	0.10	0.07	0.06	0.06	-35.2%
Senegal	0.14	0.16	0.19	0.17	0.16	0.16	0.19	0.20	0.20	0.20	0.20	26.2%
South Africa	0.68	0.77	0.68	0.68	0.68	0.70	0.66	0.72	0.68	0.66	0.64	-6.3%
South Sudan	..	..	..	..	..	..	..	..	..	0.07	0.05	..
Sudan	0.13	0.10	0.11	0.11	0.12	0.08	0.07	0.10	0.10	0.09	0.09	-20.7%
United Rep. of Tanzania	0.08	0.07	0.06	0.05	0.05	0.06	0.05	0.07	0.07	0.09	0.09	94.4%
Togo	0.12	0.09	0.08	0.07	0.11	0.12	0.15	0.15	0.27	0.19	0.19	66.0%
Tunisia	0.21	0.21	0.25	0.25	0.27	0.26	0.24	0.22	0.21	0.21	0.21	-19.9%
Zambia	0.23	0.27	0.20	0.16	0.14	0.11	0.08	0.07	0.04	0.06	0.06	-58.5%
Zimbabwe	0.54	0.46	0.47	0.47	0.63	0.55	0.43	0.49	0.49	0.45	0.46	-26.7%
Other Africa	0.08	0.09	0.11	0.09	0.09	0.10	0.10	0.09	0.08	0.08	0.08	-10.4%
Africa	0.20	0.23	0.23	0.25	0.25	0.26	0.24	0.25	0.22	0.22	0.21	-15.3%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / GDP using purchasing power paritieskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.04	0.06	0.07	0.07	0.09	0.10	0.10	0.12	0.14	0.14	0.14	67.1%
Brunei Darussalam	0.03	0.10	0.11	0.15	0.17	0.20	0.18	0.18	0.25	0.24	0.22	29.0%
Cambodia	..	..	..	..	..	0.13	0.12	0.10	0.13	0.13	0.16	..
DPR of Korea	2.23	1.61	1.29	0.96	0.73	0.61	0.63	0.70	0.49	0.29	0.22	-69.3%
India	0.27	0.29	0.30	0.33	0.35	0.37	0.34	0.30	0.30	0.30	0.28	-20.0%
Indonesia	0.10	0.11	0.14	0.14	0.16	0.18	0.21	0.21	0.19	0.17	0.17	3.6%
Malaysia	0.25	0.23	0.23	0.25	0.27	0.27	0.31	0.33	0.33	0.31	0.29	10.2%
Mongolia	..	..	..	1.29	1.17	1.07	0.82	0.73	0.69	0.55	0.52	-56.0%
Myanmar	0.19	0.15	0.14	0.13	0.10	0.12	0.11	0.07	0.04	0.07	0.08	-17.9%
Nepal	0.02	0.03	0.04	0.03	0.04	0.06	0.09	0.07	0.08	0.09	0.09	113.0%
Pakistan	0.14	0.15	0.14	0.15	0.17	0.20	0.20	0.19	0.18	0.17	0.17	-3.5%
Philippines	0.19	0.19	0.16	0.15	0.16	0.21	0.21	0.18	0.15	0.15	0.15	-2.9%
Singapore	0.26	0.26	0.26	0.25	0.28	0.24	0.21	0.15	0.12	0.11	0.10	-63.9%
Sri Lanka	0.10	0.08	0.09	0.07	0.06	0.07	0.10	0.11	0.07	0.08	0.09	43.4%
Chinese Taipei	0.48	0.44	0.44	0.36	0.37	0.35	0.37	0.36	0.29	0.26	0.25	-31.1%
Thailand	0.17	0.18	0.19	0.19	0.22	0.26	0.27	0.27	0.25	0.25	0.24	10.4%
Viet Nam	0.31	0.32	0.27	0.23	0.18	0.19	0.22	0.28	0.33	0.30	0.33	84.6%
Other non-OECD Asia	0.25	0.26	0.29	0.17	0.16	0.13	0.15	0.14	0.13	0.12	0.12	-24.7%
Asia (excl. China)	0.25	0.26	0.26	0.26	0.27	0.27	0.28	0.26	0.25	0.24	0.23	-14.3%
People's Rep. of China	1.93	2.04	1.97	1.42	1.24	0.96	0.68	0.74	0.62	0.54	0.50	-59.5%
Hong Kong, China	0.26	0.24	0.19	0.21	0.22	0.19	0.18	0.15	0.13	0.13	0.11	-48.1%
China	1.79	1.89	1.79	1.32	1.15	0.92	0.66	0.72	0.61	0.53	0.49	-57.2%
Argentina	0.30	0.28	0.27	0.28	0.33	0.28	0.30	0.29	0.26	0.27	0.27	-17.9%
Bolivia	0.12	0.15	0.17	0.19	0.21	0.23	0.20	0.22	0.26	0.28	0.27	28.7%
Brazil	0.14	0.14	0.13	0.12	0.12	0.13	0.15	0.14	0.13	0.15	0.15	25.1%
Colombia	0.24	0.21	0.20	0.20	0.18	0.18	0.16	0.14	0.12	0.12	0.12	-34.9%
Costa Rica	0.12	0.13	0.12	0.11	0.11	0.15	0.12	0.12	0.12	0.11	0.10	-8.8%
Cuba	0.31	0.30	0.32	0.22	0.24	0.23	0.22	0.16	0.16	0.13	0.13	-47.0%
Curacao ¹	15.32	9.51	7.03	3.45	1.73	1.53	2.67	2.67	1.82	2.82	2.93	69.3%
Dominican Republic	0.21	0.23	0.21	0.19	0.20	0.23	0.27	0.23	0.18	0.15	0.15	-22.4%
Ecuador	0.11	0.13	0.18	0.18	0.18	0.19	0.20	0.21	0.23	0.23	0.22	23.8%
El Salvador	0.06	0.08	0.07	0.08	0.09	0.15	0.14	0.15	0.13	0.12	0.13	47.2%
Guatemala	0.09	0.09	0.10	0.08	0.07	0.10	0.12	0.13	0.11	0.14	0.13	88.3%
Haiti	0.04	0.04	0.04	0.06	0.07	0.07	0.09	0.14	0.14	0.16	0.19	179.3%
Honduras	0.15	0.15	0.14	0.13	0.14	0.20	0.21	0.27	0.23	0.24	0.24	72.6%
Jamaica	0.38	0.47	0.49	0.34	0.42	0.40	0.47	0.45	0.31	0.32	0.31	-26.7%
Nicaragua	0.11	0.11	0.13	0.12	0.15	0.19	0.21	0.20	0.19	0.16	0.18	17.9%
Panama	0.23	0.25	0.18	0.14	0.14	0.17	0.16	0.17	0.16	0.14	0.13	-1.9%
Paraguay	0.08	0.07	0.08	0.08	0.08	0.11	0.10	0.10	0.11	0.10	0.10	30.6%
Peru	0.17	0.16	0.16	0.15	0.17	0.16	0.16	0.14	0.14	0.14	0.14	-19.4%
Suriname	..	..	..	..	..	..	0.32	0.28	0.23	0.24	0.25	..
Trinidad and Tobago	0.44	0.33	0.36	0.42	0.56	0.54	0.46	0.55	0.57	0.58	0.57	1.6%
Uruguay	0.23	0.22	0.18	0.12	0.12	0.12	0.12	0.12	0.11	0.09	0.10	-20.8%
Venezuela	0.23	0.24	0.32	0.34	0.33	0.32	0.34	0.35	0.36	0.31	0.29	-13.5%
Other non-OECD Americas	0.47	0.60	0.44	0.39	0.41	0.41	0.40	0.37	0.41	0.47	0.45	9.8%
Non-OECD Americas	0.21	0.20	0.19	0.18	0.18	0.18	0.20	0.19	0.18	0.18	0.18	-3.1%
Bahrain	0.59	0.58	0.49	0.66	0.62	0.56	0.54	0.54	0.51	0.51	0.51	-18.6%
Islamic Republic of Iran	0.08	0.10	0.20	0.26	0.31	0.38	0.41	0.42	0.39	0.44	0.44	42.9%
Iraq	0.24	0.26	0.21	0.34	0.27	0.73	0.25	0.25	0.27	0.28	0.26	-3.7%
Jordan	0.15	0.25	0.24	0.32	0.42	0.40	0.39	0.36	0.28	0.32	0.31	-26.4%
Kuwait	0.12	0.16	0.26	0.46	0.36	0.25	0.33	0.31	0.35	0.30	0.32	-10.6%
Lebanon	0.15	0.19	0.25	0.18	0.26	0.35	0.35	0.30	0.26	0.30	0.30	14.2%
Oman	0.02	0.04	0.09	0.11	0.16	0.18	0.21	0.25	0.31	0.38	0.39	138.4%
Qatar	0.07	0.14	0.17	0.32	0.37	0.45	0.33	0.35	0.26	0.28	0.27	-27.2%
Saudi Arabia	0.05	0.05	0.16	0.25	0.27	0.29	0.32	0.32	0.34	0.34	0.34	28.2%
Syrian Arab Republic	0.30	0.27	0.29	0.41	0.51	0.39	0.43	0.51	0.42	0.53	0.70	37.1%
United Arab Emirates	0.07	0.05	0.10	0.20	0.26	0.28	0.25	0.27	0.33	0.31	0.31	19.7%
Yemen	0.13	0.13	0.15	0.15	0.16	0.18	0.20	0.23	0.22	0.24	0.16	-0.1%
Middle East	0.09	0.10	0.18	0.27	0.29	0.35	0.33	0.34	0.34	0.35	0.35	21.0%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / populationtonnes CO₂ / capita

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
World ¹	3.71	3.81	3.99	3.77	3.88	3.75	3.79	4.16	4.40	4.46	4.40	13.4%
<i>Annex I Parties</i>	..	..	..	..	11.66	10.75	11.00	11.04	10.28	9.66	9.45	-19.0%
<i>Annex II Parties</i>	12.16	12.12	12.47	11.69	12.08	12.12	12.70	12.61	11.44	10.70	10.46	-13.4%
<i>North America</i>	20.15	19.79	19.89	18.56	18.79	18.66	19.67	19.02	17.09	16.13	15.51	-17.5%
<i>Europe</i>	8.58	8.48	8.99	8.23	8.24	8.03	8.11	8.19	7.29	6.26	6.31	-23.4%
<i>Asia Oceania</i>	7.50	8.12	8.10	7.88	9.18	9.64	10.04	10.40	9.90	10.23	9.98	8.7%
<i>Annex I EIT</i>	..	..	..	..	12.24	8.73	8.00	8.32	8.40	7.93	7.74	-36.8%
<i>Non-Annex I Parties</i>	..	..	..	..	1.50	1.71	1.79	2.32	2.86	3.12	3.11	107.0%
<i>Annex B Kyoto Parties</i>	..	..	..	..	9.21	8.12	7.86	8.14	7.59	6.69	6.66	-27.7%
Non-OECD Total	1.43	1.67	1.90	1.93	2.11	1.99	1.99	2.49	2.99	3.24	3.20	52.0%
OECD Total	10.40	10.39	10.74	10.08	10.27	10.30	10.77	10.73	9.95	9.34	9.18	-10.6%
Canada	15.49	16.29	17.22	15.24	15.15	15.32	16.82	16.79	15.54	15.60	15.32	1.1%
Chile	2.16	1.64	1.92	1.62	2.23	2.57	3.16	3.34	4.01	4.25	4.52	102.6%
Mexico	1.75	2.21	2.91	3.06	2.95	3.08	3.56	3.85	3.85	3.63	3.66	23.9%
United States	20.65	20.16	20.18	18.92	19.20	19.03	19.98	19.26	17.26	16.19	15.53	-19.1%
OECD Americas	16.20	15.74	15.71	14.55	14.57	14.45	15.29	14.86	13.44	12.66	12.22	-16.1%
Australia	10.86	12.85	13.96	13.85	15.13	15.73	17.45	18.28	17.51	15.78	15.83	4.6%
Israel ²	4.52	4.75	4.86	5.74	7.04	8.09	8.70	8.45	8.98	7.46	7.44	5.6%
Japan	7.15	7.60	7.43	7.15	8.43	8.85	9.00	9.22	8.68	9.32	8.99	6.7%
Korea	1.61	2.20	3.29	3.82	5.41	7.92	9.18	9.50	11.15	11.26	11.58	114.2%
New Zealand	4.71	5.32	5.24	5.78	6.45	6.48	7.50	8.13	6.96	6.89	6.74	4.5%
OECD Asia Oceania	6.21	6.80	6.99	6.94	8.28	9.20	9.80	10.13	10.16	10.37	10.26	23.8%
Austria	6.48	6.53	7.20	6.96	7.33	7.50	7.72	9.01	8.21	7.10	7.20	-1.8%
Belgium	12.21	11.81	12.73	10.24	10.66	10.99	11.10	10.25	9.52	7.83	8.25	-22.6%
Czech Republic	15.62	15.41	16.28	16.97	14.51	11.93	11.81	11.58	10.70	9.35	9.44	-34.9%
Denmark	11.16	10.40	12.30	11.93	9.92	11.16	9.51	8.94	8.51	6.10	5.63	-43.3%
Estonia	..	..	..	..	22.67	11.02	10.36	12.37	13.99	14.13	11.83	-47.8%
Finland	8.64	9.38	11.47	9.85	10.79	10.90	10.55	10.47	11.56	8.32	7.68	-28.9%
France	8.07	7.84	8.25	6.21	5.93	5.77	5.99	5.89	5.25	4.29	4.37	-26.4%
Germany	12.49	12.37	13.39	12.93	11.85	10.54	9.97	9.67	9.45	8.93	8.93	-24.6%
Greece	2.81	3.73	4.64	5.43	6.81	7.25	8.14	8.67	7.50	6.04	5.95	-12.7%
Hungary	5.82	6.66	7.72	7.54	6.34	5.45	5.22	5.42	4.71	4.05	4.32	-31.9%
Iceland	6.81	7.40	7.66	6.75	7.43	7.35	7.69	7.55	6.13	6.25	6.20	-16.5%
Ireland	7.27	6.65	7.61	7.47	8.59	9.06	10.73	10.63	8.62	7.34	7.61	-11.4%
Italy	5.35	5.72	6.29	6.04	6.86	7.05	7.38	7.84	6.55	5.26	5.45	-20.7%
Latvia	..	..	..	..	7.05	3.58	2.89	3.38	3.86	3.37	3.46	-50.9%
Luxembourg	48.10	35.45	34.18	28.14	28.11	20.05	18.44	24.63	20.96	16.62	15.47	-45.0%
Netherlands	9.67	9.66	10.27	9.55	9.88	10.57	10.14	10.24	10.23	8.81	9.21	-6.7%
Norway	5.89	5.89	6.66	6.36	6.47	7.20	7.10	7.46	7.67	6.89	7.07	9.3%
Poland	8.76	9.96	11.69	11.36	9.07	8.71	7.57	7.77	7.99	7.25	7.34	-19.0%
Portugal	1.65	1.96	2.41	2.37	3.79	4.71	5.62	5.84	4.50	4.12	4.54	19.8%
Slovak Republic	8.53	9.11	11.21	10.55	10.35	7.69	6.83	6.92	6.37	5.38	5.43	-47.5%
Slovenia	..	..	..	..	6.78	7.07	7.07	7.72	7.54	6.19	6.22	-8.2%
Spain	3.44	4.33	4.90	4.45	5.15	5.74	6.87	7.64	5.63	4.99	5.32	3.4%
Sweden	10.13	9.64	8.80	6.99	6.08	6.45	5.86	5.44	4.91	3.84	3.78	-37.8%
Switzerland	6.13	5.74	6.15	6.39	5.99	5.84	5.79	5.88	5.50	4.62	4.51	-24.8%
Turkey	1.15	1.49	1.61	1.90	2.31	2.55	3.14	3.16	3.64	4.00	4.10	77.1%
United Kingdom	11.10	10.24	10.13	9.61	9.60	8.85	8.84	8.80	7.60	6.30	5.99	-37.6%
OECD Europe ²	8.08	8.09	8.65	8.01	7.80	7.45	7.44	7.50	6.87	6.04	6.10	-21.8%
<i>IEA/Accession/Association</i>	4.17	4.15	4.28	4.03	4.14	4.34	4.47	5.00	5.37	5.52	5.46	31.7%
<i>European Union - 28</i>	..	..	..	..	8.43	7.89	7.77	7.92	7.17	6.22	6.28	-25.5%
<i>G20</i>	..	..	..	..	4.59	4.54	4.64	5.14	5.51	5.66	5.60	22.0%
<i>Africa</i>	0.67	0.78	0.84	0.85	0.84	0.80	0.81	0.93	0.96	0.97	0.96	14.1%
<i>Americas</i>	9.73	9.42	9.35	8.46	8.39	8.34	8.81	8.55	7.92	7.61	7.34	-12.6%
<i>Asia</i>	..	..	..	..	1.83	2.12	2.20	2.87	3.56	3.95	3.94	115.0%
<i>Europe</i>	..	..	..	..	9.93	8.18	7.92	8.12	7.66	6.87	6.84	-31.2%
<i>Oceania</i>	8.11	9.44	10.04	9.94	10.79	11.02	12.10	12.63	11.94	10.89	10.90	1.0%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / populationtonnes CO₂ / capita

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Non-OECD Total	1.43	1.67	1.90	1.93	2.11	1.99	1.99	2.49	2.99	3.24	3.20	52.0%
Albania	1.77	1.80	2.55	2.34	1.73	0.58	1.00	1.27	1.35	1.42	1.32	-23.3%
Armenia	..	..	..	..	5.60	1.04	1.11	1.37	1.37	1.74	1.56	-72.2%
Azerbaijan	..	..	..	..	7.47	4.21	3.39	3.46	2.60	3.23	3.19	-57.3%
Belarus	..	..	..	..	9.80	5.59	5.22	5.69	6.31	6.06	5.61	-42.8%
Bosnia and Herzegovina	..	..	..	..	5.30	0.85	3.62	4.14	5.34	5.66	5.84	10.1%
Bulgaria	7.48	8.41	9.60	9.18	8.55	6.27	5.16	6.07	6.00	5.76	6.10	-28.7%
Croatia	..	..	..	..	4.25	3.17	3.79	4.48	4.13	3.57	3.69	-13.2%
Cyprus ¹	2.83	3.28	5.09	5.14	6.79	7.82	9.13	9.61	8.86	6.73	6.96	2.6%
FYR of Macedonia	..	..	..	..	4.31	4.26	4.24	4.37	4.04	3.59	3.48	-19.1%
Georgia	..	..	..	..	6.97	1.72	1.05	0.97	1.27	2.07	2.26	-67.7%
Gibraltar	2.63	2.39	3.34	3.22	5.10	9.68	11.72	13.08	15.29	16.25	17.39	241.2%
Kazakhstan	..	..	..	..	14.51	10.78	7.53	10.36	13.55	13.29	12.83	-11.6%
Kosovo	..	..	..	..	..	..	3.01	3.90	4.90	4.06	4.78	..
Kyrgyzstan	..	..	..	..	5.18	0.98	0.91	0.95	1.11	1.55	1.66	-68.0%
Lithuania	..	..	..	..	8.71	3.70	2.92	3.74	3.98	3.57	3.63	-58.3%
Malta	2.16	2.14	3.13	3.45	6.54	6.31	5.46	6.74	6.22	5.51	3.81	-41.7%
Republic of Moldova	..	..	..	..	8.26	3.24	1.80	2.14	2.20	2.04	2.13	-74.2%
Montenegro	..	..	..	..	..	..	..	3.27	4.18	3.57	3.80	..
Romania	5.60	6.60	7.97	7.68	7.25	5.19	3.84	4.35	3.69	3.43	3.51	-51.6%
Russian Federation	..	..	..	..	14.59	10.43	10.06	10.32	10.70	10.34	10.19	-30.1%
Serbia	..	..	..	..	6.16	4.35	5.30	6.66	6.29	5.34	6.27	1.8%
Tajikistan	..	..	..	..	2.08	0.43	0.35	0.34	0.30	0.49	0.51	-75.5%
Turkmenistan	..	..	..	..	12.17	7.94	8.14	10.13	11.29	12.62	12.86	5.6%
Ukraine	..	..	..	..	13.27	7.68	6.00	6.24	5.80	5.19	4.20	-68.4%
Uzbekistan	..	..	..	..	5.60	4.15	4.62	4.09	3.40	3.18	3.05	-45.5%
Former Soviet Union ¹	7.98	9.82	11.12	11.15	..	..	..	..	..	..	..	..
Former Yugoslavia ¹	3.09	3.54	3.87	5.29	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia¹	7.41	9.05	10.28	10.37	11.50	7.67	7.00	7.37	7.54	7.25	7.05	-38.7%
Algeria	0.57	0.81	1.43	1.86	1.97	1.91	1.97	2.33	2.65	3.16	3.29	66.5%
Angola	0.25	0.28	0.32	0.29	0.35	0.30	0.31	0.34	0.71	0.80	0.82	131.6%
Benin	0.10	0.14	0.11	0.11	0.05	0.04	0.20	0.33	0.48	0.45	0.49	848.9%
Botswana	..	..	..	1.27	2.03	2.02	2.32	2.30	1.60	3.13	3.12	53.3%
Cameroon	0.11	0.13	0.19	0.23	0.22	0.18	0.18	0.16	0.25	0.25	0.26	17.7%
Congo	0.42	0.39	0.38	0.36	0.27	0.20	0.16	0.24	0.45	0.59	0.59	118.5%
Côte d'Ivoire	0.44	0.46	0.41	0.30	0.22	0.23	0.38	0.32	0.31	0.40	0.43	91.4%
Dem. Rep. of the Congo	0.13	0.11	0.12	0.11	0.09	0.03	0.02	0.02	0.03	0.06	0.04	-58.6%
Egypt	0.56	0.66	0.94	1.31	1.38	1.31	1.46	1.93	2.15	2.16	2.17	57.3%
Eritrea	..	..	..	..	..	0.25	0.17	0.14	0.10	0.11	0.12	..
Ethiopia	0.04	0.04	0.04	0.03	0.05	0.04	0.05	0.06	0.07	0.10	0.10	127.0%
Gabon	0.79	1.16	1.77	2.03	0.96	1.21	1.19	1.26	1.72	1.93	1.88	96.9%
Ghana	0.22	0.23	0.20	0.16	0.17	0.19	0.26	0.30	0.43	0.49	0.51	195.4%
Kenya	0.28	0.26	0.27	0.23	0.24	0.21	0.25	0.21	0.28	0.28	0.31	30.5%
Libya	1.68	3.31	5.51	5.53	5.87	6.75	6.89	7.41	7.67	7.65	7.22	22.8%
Mauritius	0.31	0.47	0.59	0.60	1.10	1.38	2.05	2.41	2.93	3.14	3.14	185.8%
Morocco	0.40	0.54	0.68	0.72	0.79	0.96	1.02	1.29	1.44	1.58	1.60	102.9%
Mozambique	0.31	0.23	0.20	0.11	0.08	0.07	0.07	0.07	0.10	0.14	0.18	122.4%
Namibia	..	..	..	..	..	1.08	1.00	1.23	1.40	1.50	1.55	..
Niger	..	..	..	..	..	..	0.06	0.05	0.08	0.10	0.10	..
Nigeria	0.10	0.17	0.34	0.38	0.29	0.30	0.36	0.40	0.35	0.34	0.35	20.6%
Senegal	0.28	0.33	0.37	0.33	0.28	0.28	0.36	0.41	0.42	0.43	0.44	54.8%
South Africa	6.80	7.90	7.17	6.76	6.63	6.27	6.25	7.82	7.98	8.03	7.77	17.3%
South Sudan	..	..	..	..	..	..	..	..	..	0.13	0.09	..
Sudan	0.22	0.20	0.19	0.18	0.21	0.14	0.16	0.25	0.32	0.34	0.38	86.3%
United Rep. of Tanzania	0.10	0.09	0.08	0.07	0.07	0.08	0.08	0.13	0.13	0.20	0.22	231.1%
Togo	0.16	0.13	0.13	0.09	0.15	0.14	0.19	0.17	0.32	0.25	0.26	68.7%
Tunisia	0.72	0.86	1.24	1.32	1.48	1.54	1.82	1.93	2.19	2.25	2.28	53.7%
Zambia	0.78	0.87	0.55	0.38	0.31	0.22	0.16	0.18	0.12	0.20	0.20	-35.3%
Zimbabwe	1.35	1.16	1.09	1.10	1.55	1.29	1.06	0.79	0.66	0.76	0.75	-51.3%
Other Africa	0.12	0.13	0.15	0.11	0.11	0.11	0.12	0.13	0.14	0.15	0.15	33.9%
Africa	0.67	0.78	0.84	0.85	0.84	0.80	0.81	0.93	0.96	0.97	0.96	14.1%

1. Please refer to the chapter *Geographical Coverage*.

CO₂ emissions / populationtonnes CO₂ / capita

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	% change 90-15
Bangladesh	0.04	0.06	0.08	0.08	0.11	0.14	0.16	0.22	0.33	0.40	0.44	306.0%
Brunei Darussalam	2.93	8.74	13.67	13.21	12.68	15.26	13.37	13.32	17.46	16.06	14.13	11.4%
Cambodia	..	..	..	..	..	0.14	0.16	0.20	0.32	0.40	0.51	..
DPR of Korea	4.67	4.83	6.22	6.89	5.79	3.52	3.06	3.16	2.01	1.15	0.90	-84.5%
India	0.32	0.35	0.38	0.48	0.61	0.74	0.85	0.94	1.30	1.56	1.58	158.7%
Indonesia	0.21	0.29	0.46	0.51	0.74	1.04	1.21	1.41	1.56	1.71	1.72	132.5%
Malaysia	1.14	1.32	1.71	2.09	2.72	3.84	4.91	6.04	6.75	7.37	7.27	166.9%
Mongolia	..	..	..	6.13	5.89	4.46	3.75	4.35	5.22	6.16	5.80	-1.5%
Myanmar	0.16	0.13	0.15	0.15	0.09	0.15	0.19	0.21	0.15	0.37	0.45	385.3%
Nepal	0.02	0.02	0.03	0.03	0.05	0.08	0.13	0.12	0.15	0.21	0.20	311.5%
Pakistan	0.27	0.30	0.31	0.40	0.52	0.65	0.68	0.75	0.76	0.77	0.77	48.7%
Philippines	0.62	0.70	0.70	0.52	0.61	0.82	0.87	0.83	0.83	0.97	1.03	68.0%
Singapore	2.87	3.73	5.24	6.07	9.50	10.66	10.46	8.87	8.72	8.29	8.03	-15.5%
Sri Lanka	0.22	0.20	0.25	0.22	0.22	0.30	0.56	0.69	0.62	0.81	0.93	331.9%
Chinese Taipei	2.00	2.53	4.01	3.59	5.49	7.28	9.77	11.17	11.04	10.69	10.65	93.9%
Thailand	0.43	0.50	0.71	0.81	1.43	2.36	2.43	3.04	3.35	3.60	3.64	154.8%
Viet Nam	0.37	0.35	0.28	0.30	0.26	0.38	0.57	0.96	1.45	1.58	1.83	596.9%
Other non-OECD Asia	0.38	0.42	0.54	0.34	0.31	0.31	0.33	0.38	0.48	0.52	0.48	54.4%
Asia (excl. China)	0.40	0.44	0.53	0.60	0.74	0.90	1.03	1.16	1.40	1.57	1.59	114.2%
People's Rep. of China	0.93	1.12	1.39	1.55	1.83	2.40	2.44	4.11	5.76	6.62	6.59	260.5%
Hong Kong, China	2.28	2.44	2.88	4.09	5.84	5.93	6.05	6.07	5.98	6.62	6.01	2.9%
China	0.93	1.13	1.40	1.56	1.85	2.41	2.46	4.12	5.76	6.62	6.59	256.5%
Argentina	3.39	3.27	3.39	2.89	3.04	3.35	3.76	3.82	4.21	4.32	4.41	45.2%
Bolivia	0.47	0.64	0.75	0.69	0.75	0.91	0.85	0.99	1.38	1.73	1.70	126.8%
Brazil	0.89	1.20	1.37	1.14	1.23	1.40	1.66	1.65	1.87	2.30	2.17	77.0%
Colombia	1.18	1.14	1.25	1.27	1.34	1.45	1.34	1.24	1.31	1.52	1.50	12.2%
Costa Rica	0.67	0.83	0.90	0.71	0.84	1.27	1.15	1.28	1.46	1.53	1.44	71.5%
Cuba	2.35	2.56	3.10	3.19	3.22	2.06	2.46	2.22	2.89	2.58	2.62	-18.7%
Curaçao ¹	90.11	60.30	50.13	24.57	14.09	13.23	26.73	27.22	19.13	30.43	30.72	117.9%
Dominican Republic	0.75	1.01	1.09	0.96	1.03	1.42	2.14	1.97	1.98	1.93	2.03	97.0%
Ecuador	0.56	0.85	1.30	1.29	1.30	1.46	1.44	1.74	2.15	2.44	2.33	78.5%
El Salvador	0.35	0.46	0.35	0.33	0.40	0.82	0.89	1.05	0.96	0.96	1.05	162.9%
Guatemala	0.41	0.48	0.59	0.39	0.35	0.57	0.73	0.81	0.70	1.01	0.93	164.6%
Haiti	0.08	0.08	0.11	0.12	0.13	0.12	0.16	0.21	0.21	0.26	0.30	127.8%
Honduras	0.41	0.43	0.47	0.39	0.44	0.64	0.72	1.04	0.98	1.10	1.14	157.6%
Jamaica	2.91	3.69	3.05	2.02	3.04	3.38	3.76	3.84	2.53	2.56	2.50	-17.5%
Nicaragua	0.60	0.66	0.56	0.49	0.44	0.54	0.70	0.75	0.75	0.75	0.85	90.6%
Panama	1.59	1.77	1.47	1.20	1.04	1.49	1.61	2.04	2.44	2.74	2.72	162.1%
Paraguay	0.23	0.25	0.42	0.39	0.46	0.73	0.62	0.60	0.75	0.79	0.86	86.9%
Peru	1.12	1.20	1.17	0.92	0.88	0.97	1.02	1.04	1.40	1.55	1.57	78.6%
Suriname	..	..	..	..	..	..	3.03	3.36	3.27	3.70	3.80	..
Trinidad and Tobago	5.61	4.52	5.87	5.68	6.46	6.50	7.97	13.52	16.83	17.16	16.76	159.3%
Uruguay	1.81	1.88	1.83	1.00	1.16	1.36	1.53	1.55	1.77	1.83	1.86	60.6%
Venezuela	3.84	4.20	5.43	4.86	4.71	4.78	4.75	5.12	5.91	5.04	4.40	-6.6%
Other non-OECD Americas	3.14	4.04	3.65	3.18	4.11	4.15	4.65	4.59	5.05	5.52	5.56	35.5%
Non-OECD Americas	1.47	1.63	1.80	1.55	1.61	1.74	1.93	1.97	2.22	2.43	2.33	45.2%
Bahrain	13.09	19.58	20.10	21.71	21.53	23.85	23.75	23.71	20.26	21.80	21.83	1.4%
Islamic Republic of Iran	1.33	2.08	2.29	3.07	3.05	4.05	4.74	5.96	6.71	7.12	6.98	129.1%
Iraq	1.01	1.33	1.92	2.44	3.00	4.71	2.99	2.71	3.35	4.00	3.63	21.0%
Jordan	0.78	1.08	1.89	2.68	2.77	2.84	2.99	3.36	2.88	3.24	3.13	13.0%
Kuwait	17.37	14.37	19.09	21.18	13.50	19.76	24.00	28.59	25.17	21.05	21.93	62.5%
Lebanon	1.95	2.22	2.55	2.47	2.04	4.22	4.32	3.63	4.20	3.99	3.88	90.2%
Oman	0.34	0.82	1.95	3.76	5.61	6.70	9.12	10.04	14.39	14.14	14.32	155.3%
Qatar	18.82	30.04	31.16	28.79	26.11	33.59	35.84	39.67	32.33	36.10	35.77	37.0%
Saudi Arabia	2.08	3.03	10.03	8.81	9.23	10.16	10.97	12.04	14.92	16.40	16.85	82.5%
Syrian Arab Republic	0.82	1.09	1.38	1.83	2.19	2.17	2.26	2.95	2.70	1.47	1.42	-35.1%
United Arab Emirates	8.95	9.26	18.90	26.39	28.64	29.63	26.17	24.79	18.54	19.40	19.68	-31.3%
Yemen	0.19	0.26	0.43	0.50	0.53	0.62	0.75	0.92	0.95	0.86	0.42	-21.1%
Middle East	1.49	2.10	3.43	4.06	4.22	5.18	5.45	6.35	7.26	7.73	7.66	81.8%

1. Please refer to the chapter *Geographical Coverage*.

Per capita emissions by sector in 2015 ¹kilogrammes CO₂ / capita

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use ²	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
World ³	4 403	1 846	226	827	1 055	790	449	254
<i>Annex I Parties</i>	9 450	3 860	548	1 089	2 672	2 309	1 281	749
<i>Annex II Parties</i>	10 457	3 978	647	1 158	3 253	2 855	1 421	788
<i>North America</i>	15 513	5 838	1 032	1 379	5 386	4 567	1 879	991
<i>Europe</i>	6 313	2 061	356	797	1 884	1 786	1 215	759
<i>Asia Oceania</i>	9 980	4 856	548	1 619	2 036	1 796	922	400
<i>Annex I EIT</i>	7 737	4 082	337	1 012	1 328	997	977	721
<i>Non-Annex I Parties</i>	3 106	1 407	155	770	505	459	268	147
<i>Annex B Kyoto Parties</i>	6 659	2 528	427	885	1 713	1 604	1 106	693
Non-OECD Total	3 201	1 478	152	780	506	445	286	165
OECD Total	9 180	3 596	577	1 052	2 730	2 423	1 225	680
Canada	15 319	2 871	3 272	1 731	4 848	3 905	2 598	1 126
Chile	4 525	1 831	128	856	1 398	1 252	312	172
Mexico	3 655	1 182	418	546	1 244	1 206	267	147
United States	15 534	6 169	782	1 339	5 446	4 640	1 798	976
OECD Americas	12 224	4 558	849	1 157	4 232	3 627	1 429	756
Australia	15 829	7 915	1 359	1 743	3 936	3 310	876	381
Israel ⁴	7 435	4 655	266	304	2 018	2 011	192	41
Japan	8 990	4 410	401	1 604	1 637	1 473	939	413
Korea	11 577	6 037	902	1 592	1 918	1 824	1 129	610
New Zealand	6 738	1 187	359	1 397	3 113	2 803	682	123
OECD Asia Oceania	10 258	5 127	620	1 561	2 007	1 811	942	435
Austria	7 201	1 589	750	1 266	2 633	2 538	962	655
Belgium	8 246	1 556	527	1 639	2 347	2 272	2 177	1 440
Czech Republic	9 442	5 138	411	1 129	1 642	1 598	1 123	741
Denmark	5 628	1 855	390	596	2 026	1 876	760	372
Estonia	11 830	8 934	96	465	1 748	1 673	587	125
Finland	7 676	3 060	609	1 319	1 982	1 861	706	197
France	4 368	490	251	611	1 840	1 774	1 175	653
Germany	8 934	3 952	289	1 150	1 929	1 866	1 614	1 037
Greece	5 947	2 810	378	580	1 536	1 322	643	493
Hungary	4 318	1 204	124	642	1 212	1 187	1 136	683
Iceland	6 205	10	-	1 571	2 558	2 417	2 065	27
Ireland	7 608	2 528	80	845	2 385	2 309	1 771	1 296
Italy	5 446	1 793	197	594	1 696	1 604	1 167	770
Latvia	3 462	939	-	380	1 546	1 437	596	213
Luxembourg	15 469	846	-	1 708	10 133	10 105	2 781	1 858
Netherlands	9 213	3 699	614	1 296	1 777	1 700	1 826	951
Norway	7 074	398	2 361	1 077	2 755	2 096	483	58
Poland	7 344	3 900	211	712	1 206	1 177	1 315	875
Portugal	4 541	1 834	257	543	1 522	1 453	385	172
Slovak Republic	5 429	1 244	928	1 308	1 100	1 042	848	471
Slovenia	6 222	2 235	3	786	2 556	2 537	641	342
Spain	5 323	1 754	405	623	1 843	1 687	697	350
Sweden	3 783	630	290	701	2 010	1 947	152	16
Switzerland	4 505	310	52	612	1 956	1 922	1 574	1 022
Turkey	4 096	1 595	184	579	936	863	801	390
United Kingdom	5 986	1 888	411	571	1 813	1 716	1 303	955
OECD Europe ⁴	6 097	2 169	322	768	1 685	1 599	1 153	707
<i>IEA/Accession/Association</i>	5 458	2 392	268	1 114	1 105	972	578	312
<i>European Union - 28</i>	6 282	2 285	318	781	1 740	1 660	1 157	727
<i>G20</i>	5 596	2 488	279	1 109	1 138	992	583	324
<i>Africa</i>	961	408	70	121	264	253	98	61
<i>Americas</i>	7 336	2 591	524	804	2 569	2 234	848	446
<i>Asia</i>	3 938	1 859	176	1 012	546	487	345	184
<i>Europe</i>	6 835	2 907	340	873	1 625	1 435	1 091	725
<i>Oceania</i>	10 897	5 197	880	1 287	2 890	2 450	642	258

1. This table shows per capita emissions for the same sectors which are present throughout this publication. In particular, the emissions from electricity and heat production are shown separately and not reallocated. 2. Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. 3. World includes international bunkers in the transport sector. 4. Please refer to the chapter *Geographical Coverage*.

Per capita emissions by sector in 2015

kilogrammes CO₂ / capita

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
Non-OECD Total	3 201	1 478	152	780	506	445	286	165
Albania	1 323	-	27	235	844	806	217	81
Armenia	1 556	423	-	136	487	484	511	276
Azerbaijan	3 192	1 292	201	242	724	654	732	571
Belarus	5 605	2 902	380	474	1 102	926	747	444
Bosnia and Herzegovina	5 838	3 891	192	586	813	813	356	148
Bulgaria	6 100	3 948	162	519	1 253	1 193	219	104
Croatia	3 689	785	347	519	1 391	1 339	647	352
Cyprus ¹	6 965	3 474	-	693	2 140	2 140	658	410
FYR of Macedonia	3 484	1 944	3	514	888	885	135	18
Georgia	2 255	343	-	443	968	961	501	381
Gibraltar	17 390	4 783	-	-	12 607	12 607	-	-
Kazakhstan	12 833	4 960	2 773	2 902	844	756	1 353	826
Kosovo	4 783	3 578	-	366	634	631	204	47
Kyrgyzstan	1 659	485	10	304	449	448	411	294
Lithuania	3 631	570	539	404	1 739	1 655	379	203
Malta	3 809	1 966	-	71	1 347	1 231	425	102
Republic of Moldova	2 132	1 019	-	217	542	530	354	234
Montenegro	3 796	2 499	-	285	899	884	113	27
Romania	3 509	1 457	157	623	779	749	493	315
Russian Federation	10 194	5 634	472	1 281	1 669	1 044	1 138	904
Serbia	6 274	4 462	101	561	823	814	328	164
Tajikistan	510	34	3	1	272	272	201	-
Turkmenistan	12 855	3 858	975	437	2 189	1 465	5 396	86
Ukraine	4 195	2 040	97	927	513	419	619	500
Uzbekistan	3 054	1 276	93	403	206	114	1 076	828
Non-OECD Europe and Eurasia¹	7 047	3 594	421	975	1 112	798	945	645
Algeria	3 286	927	324	271	1 172	1 117	592	515
Angola	816	151	9	89	365	333	202	75
Benin	487	21	-	38	421	421	7	6
Botswana	3 118	1 686	-	317	1 045	1 031	70	20
Cameroon	258	50	18	19	148	142	22	20
Congo	585	103	-	17	447	362	18	18
Côte d'Ivoire	425	167	7	63	139	124	49	20
Dem. Rep. of the Congo	35	-	-	1	35	29	-	-
Egypt	2 170	939	129	292	601	571	209	178
Eritrea	115	66	-	4	36	36	10	9
Ethiopia	103	-	-	35	50	47	18	8
Gabon	1 881	507	26	676	466	466	206	104
Ghana	512	120	1	65	287	266	40	28
Kenya	307	24	2	74	176	172	32	28
Libya	7 216	3 962	85	142	2 841	2 840	185	185
Mauritius	3 141	1 893	-	269	822	785	156	116
Morocco	1 598	629	19	225	462	459	262	180
Mozambique	180	46	1	27	91	84	15	4
Namibia	1 554	16	-	137	857	810	545	3
Niger	100	26	-	10	60	60	3	3
Nigeria	354	71	62	41	135	135	45	9
Senegal	439	161	3	81	171	163	23	21
South Africa	7 772	4 442	792	1 017	974	906	547	279
South Sudan	86	23	6	1	54	53	3	-
Sudan	383	98	4	45	197	195	38	13
United Rep. of Tanzania	217	52	-	27	132	132	7	6
Togo	256	3	-	23	200	200	30	30
Tunisia	2 275	819	44	476	597	574	339	174
Zambia	204	18	2	95	71	68	18	1
Zimbabwe	755	457	5	67	161	150	66	12
Other Africa	148	40	4	20	67	64	18	7
Africa	961	408	70	121	264	253	98	61

1. Please refer to the chapter *Geographical Coverage*.

Per capita emissions by sector in 2015

kilogrammes CO₂ / capita

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Other sectors	of which: residential
Bangladesh	438	208	1	104	57	44	67	46
Brunei Darussalam	14 128	5 624	4 025	980	3 208	3 208	292	201
Cambodia	514	161	-	15	271	229	68	32
DPR of Korea	896	143	2	529	56	56	166	5
India	1 576	814	28	408	194	180	132	66
Indonesia	1 716	666	93	351	499	439	106	78
Malaysia	7 267	3 401	672	950	2 024	1 944	220	59
Mongolia	5 801	3 980	7	490	674	491	650	362
Myanmar	452	90	15	97	190	165	60	-
Nepal	196	-	-	78	80	80	39	14
Pakistan	773	241	8	206	216	209	102	83
Philippines	1 031	503	12	140	306	262	70	26
Singapore	8 028	3 963	814	1 940	1 199	1 170	111	36
Sri Lanka	930	323	2	141	414	401	50	25
Chinese Taipei	10 648	6 349	622	1 694	1 565	1 533	418	184
Thailand	3 642	1 336	287	800	951	906	269	61
Viet Nam	1 835	802	-	552	350	340	131	75
Other non-OECD Asia	480	149	-	103	195	162	32	12
Asia (excl. China)	1 594	757	51	373	289	268	123	63
People's Rep. of China	6 593	3 205	246	2 019	610	504	513	262
Hong Kong, China	6 006	3 823	-	970	997	995	216	105
China	6 590	3 209	245	2 014	612	506	511	261
Argentina	4 409	1 283	420	723	1 077	961	906	546
Bolivia	1 704	314	76	179	717	679	416	135
Brazil	2 169	438	138	451	949	859	192	86
Colombia	1 499	287	108	307	617	592	181	75
Costa Rica	1 441	15	6	214	1 105	1 101	102	34
Cuba	2 622	1 372	57	746	121	116	326	50
Curaçao ¹	30 716	3 760	16 620	2 500	6 779	6 779	1 057	1 057
Dominican Republic	2 029	1 051	9	288	528	412	154	120
Ecuador	2 327	536	89	270	1 049	998	383	150
El Salvador	1 054	259	-	127	549	549	118	96
Guatemala	926	288	7	121	455	454	55	54
Haiti	299	88	-	56	131	131	25	24
Honduras	1 143	428	-	160	507	484	48	34
Jamaica	2 504	951	-	825	608	608	120	51
Nicaragua	845	270	8	103	365	329	100	23
Panama	2 718	820	-	600	1 101	1 099	198	142
Paraguay	856	-	-	23	800	796	32	32
Peru	1 566	376	123	283	662	647	122	74
Suriname	3 804	1 647	40	129	1 244	783	745	77
Trinidad and Tobago	16 758	4 422	6 064	3 485	2 481	2 211	306	287
Uruguay	1 859	206	119	231	1 022	1 016	281	122
Venezuela	4 399	1 067	706	975	1 462	1 461	189	144
Other non-OECD Americas	5 562	2 915	1	217	1 672	1 587	757	117
Non-OECD Americas	2 334	579	191	443	868	807	253	129
Bahrain	21 833	14 843	2 699	1 519	2 574	2 497	198	198
Islamic Republic of Iran	6 983	1 955	479	1 111	1 727	1 534	1 712	1 335
Iraq	3 626	2 158	307	238	695	695	227	227
Jordan	3 131	1 472	79	242	1 031	1 027	307	200
Kuwait	21 933	10 902	3 527	4 086	3 266	3 266	151	151
Lebanon	3 879	2 207	-	188	950	950	534	534
Oman	14 317	3 713	1 685	5 322	2 925	2 925	672	110
Qatar	35 768	9 030	13 813	6 070	6 701	6 701	155	155
Saudi Arabia	16 850	7 790	852	3 556	4 506	4 417	147	147
Syrian Arab Republic	1 418	603	31	193	346	341	246	125
United Arab Emirates	19 680	7 899	282	8 020	3 372	3 262	106	106
Yemen	416	146	28	43	115	115	84	68
Middle East	7 664	3 040	600	1 521	1 772	1 687	730	572

1. Please refer to the chapter *Geographical Coverage*.

6. INDICATOR SOURCES AND METHODS

CO₂ emissions

The estimates of CO₂ emissions in this publication are based on the *2006 IPCC Guidelines* and represent the total emissions from fuel combustion. This is in contrast to estimates presented prior to the 2015 edition of this publication which were based on the *Revised 1996 IPCC Guidelines*. For details on the impact of this change in methodologies see the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

National totals do not include emissions from international marine and aviation bunkers. See the Country Notes in the chapter *Understanding the IEA CO₂ emissions estimates* for further details.

Population

For OECD countries, the main source of these series for 1970 to 2016 when available is the OECD *National Accounts Statistics* database [ISSN: 2074-3947 (online)], last published in book format as *National Accounts of OECD Countries, Volume 2016 Issue 2: Main Aggregates*, OECD 2017. Data for 2016 for **Australia, Canada, Chile, Greece, Iceland, Israel, Japan, Korea, Mexico, New Zealand, the Slovak Republic, Switzerland, Turkey and the United States** were estimated using the growth rates from the population series in *OECD Economic Outlook No. 95*, long-term baseline projections. Data for 1960 to 1969 have been estimated using the growth rates from the population series published in the *OECD Factbook 2015* (online database version). Growth rates from the *OECD Factbook 2015* were also used to estimate data for **Chile** (prior to 1986), **Estonia** (prior to 1993), **Israel** (prior to 1995), the **Slovak Republic** (prior to 1990) and **Slovenia** (prior to 1995).

For non-OECD countries, the main source of the population data is *World Development Indicators*, the World Bank, Washington D.C., 2016.

Population data for **Former Soviet Union** (before 1990), **Chinese Taipei**, **Former Yugoslavia** (before 1990) and for a few countries within the regions⁶ **Other Africa**, **Other non-OECD Americas** and **Other non-OECD Asia** are based on the CHELEM-CEPII online database, Bureau van Dijk, Paris, 2017. Population data for **Cyprus**¹ are taken from the Eurostat online database. Population data for **Gibraltar** are taken from the government of Gibraltar *Key Indicators* publication available online.

GDP and GDP PPP

GDP using exchanges rates: expressed in billion 2010 USD.

For OECD countries, the main source of these series for 1970 to 2016 is the OECD *National Accounts Statistics* database [ISSN: 2074-3947 (online)], last published in book format as *National Accounts of OECD Countries, Volume 2016 Issue 2: Main Aggregates*, OECD 2017. GDP data for **Australia, France, Greece, Korea, Sweden** and the **United Kingdom** for 1960 to 1969 and **Denmark** for 1966 to 1969 as well as for **Netherlands** for 1969 were taken from the same source. GDP data for 1960 to 1969 for the other countries have been estimated using the growth rates from the series in the *OECD Economic Outlook No 98* and other data previously published by the OECD. Growth rates from these sources were also used to estimate data for the **Czech Republic** (prior to 1990), **Hungary** (prior to 1991) and **Poland** (prior to 1990) and the **Slovak Republic** (prior to 1992). Data

1. Please refer to the section on Geographical coverage.

for **Chile** (prior to 1986) and **Estonia** (prior to 1992) are IEA Secretariat estimates based on GDP growth rates from the World Bank.

The GDP data have been compiled for individual countries at market prices in local currency and annual rates. These data have been scaled up/down to the price levels of 2010 and then converted to US dollars using the yearly average 2010 exchange rates.

For non-OECD countries, the main source of the GDP data is *World Development Indicators*, The World Bank, Washington D.C., 2017. GDP figures for **Eritrea, Gibraltar, Myanmar, Democratic People's Republic of Korea, Former Soviet Union** (before 1990), **Syrian Arab Republic, Chinese Taipei, Former Yugoslavia** (before 1990) and a few countries within the regions⁶ **Other Africa, Other non-OECD Americas** and **Other non-OECD Asia** are based on the CHELEM-CEPII online databases, Bureau van Dijk, 2017. For **Curaçao**, GDP figures are based on historical CHELEM-CEPII GDP data for Netherlands Antilles before the country's dissolution, and on Curaçao/Sint Maarten nominal GDP ratios calculated based on information received from Curaçao Central bank. For **South Sudan**, GDP figures are based on data from the International Monetary Fund.

The GDP data have been compiled for all individual countries at market prices in 2010 US dollars.

GDP using purchasing power parities: expressed in billion 2010 USD. Purchasing power parities are the rates of currency conversion that equalise the purchasing power of different currencies. A given sum of money, when converted into different currencies at the PPP rates, buys the same basket of goods and services in all countries. In other words, PPPs are the rates of currency conversion which eliminate the differences in price levels between different countries. The PPPs selected to convert the GDP from national currencies to US dollars were aggregated using the Èltetö, Köves and Szulc (EKS) Eurostat-OECD method and rebased on the United States. For a more detailed description of the methodology please see *Eurostat-OECD Methodological Manual on Purchasing Power Parities*, 2012 edition, European Union / OECD 2012.

For OECD countries, the GDP PPP data have been compiled for individual countries at market prices in local currency and annual rates. These data have been scaled up/down to the price levels of 2010 and then converted to US dollars using the yearly average 2010 purchasing power parities (PPPs). See *GDP using exchange rates* for sources.

For non-OECD countries, the main source of the GDP PPP data is *World Development Indicators*, The World Bank, Washington, D.C., 2017. However, this source is available for GDP PPP (constant 2011 US dollars scaled to the levels of 2010 using current PPP US dollars) only from 1990. Therefore, prior to 1990 GDP PPP data have been calculated based on the PPP conversion factor (GDP) to market exchange rate ratio.

GDP PPP figures for **Argentina, Cuba, Eritrea, Gibraltar, Libya, Myanmar, Democratic People's Republic of Korea, Serbia, Former Soviet Union** (before 1990), **Syrian Arab Republic, Chinese Taipei** (before 1990), **Former Yugoslavia** (before 1990), and a few countries within the regions² **Other Africa, Other non-OECD Americas** and **Other non-OECD Asia** are based on the PPP conversion factor (GDP) to market exchange rate ratio.

For **Gibraltar**, GDP PPP figures are based on historical CHELEM-CEPII GDP PPP data and government of Gibraltar national accounts.

For **Curaçao**, GDP PPP figures are based on historical CHELEM-CEPII GDP data for Netherlands Antilles before its dissolving, and for 2012-2015 GDP PPP is calculated based on historical GDP PPP / GDP ratio.

For **South Sudan**, GDP PPP figures are based on International Monetary Fund data.

GDP PPP figures for **Bosnia and Herzegovina** (up to 1993) and **Croatia** (up to 1994) have been estimated based on the growth rates of the CHELEM-CEPII online database, Bureau van Dijk, 2017. The GDP PPP data have been converted from GDP using purchasing power parity rates. These data have been scaled to the price levels of 2010.

The GDP PPP reflect the changes to power purchasing parity rates based on the 2011 International Comparison Program (ICP), published in 2014. The ICP has worked for 6 years to better estimate the value of the PPP 'basket of goods' for all countries for which the World Bank calculates GDP PPP. For many countries, this value has significantly changed in comparison to previous ICP exercises. This leads to significant revisions to GDP PPP for many countries compared to previous publications.

Please note that the regional totals shown for OECD and other regions were calculated by summing

2. Due to lack of complete time series for Other non-OECD Americas, figures for population do not include British Virgin Islands, Falkland Islands (Malvinas), Martinique, and Saint Pierre and Miquelon. Figures for population and GDP of Other Asia do not include Cook Islands.

individual countries' GDP data. This calculation yields slightly different results to the GDP totals published by OECD in its national accounts which are derived from chained-linked indices. GDP data from the World Bank have also been summed rather than using chain-linked indices.

Electricity output

Total output (shown in the summary tables section) includes electricity generated using fossil fuels, nuclear, hydro (excluding pumped storage), geothermal, solar, biofuels, etc.

Both **main activity**³ **producer** and **autoproducer**⁴ **plants** have been included where available.

Data include the total amount of electricity in TWh generated by both **electricity plants** and **CHP plants**. Heat production from CHP plants is not included.

CO₂ / TPES

This ratio is expressed in tonnes of CO₂ per terajoule. It has been calculated using the CO₂ fuel combustion emissions and total primary energy supply (including biofuels and other non-fossil forms of energy).

CO₂ / TFC

This ratio is expressed in tonnes of CO₂ per terajoule. It has been calculated using the CO₂ fuel combustion emissions and total final consumption (including biofuels and other non-fossil forms of energy).

CO₂ / GDP

This ratio is expressed in kilogrammes of CO₂ per 2010 US dollar. It has been calculated using CO₂ fuel combustion emissions and is shown with both GDP calculated using exchange rates and GDP calculated using purchasing power parities.

3. Main activity producers generate electricity and/or heat for sale to third parties, as *their primary activity*. They may be privately or publicly owned. Note that the sale need not take place through the public grid.

4. Autoproducer undertakings generate electricity and/or heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned.

CO₂ / population

This ratio is expressed in tonnes of CO₂ per capita. It has been calculated using CO₂ fuel combustion emissions.

Per capita CO₂ emissions by sector

These ratios are expressed in kilogrammes of CO₂ per capita. They have been calculated in two different ways. In the first ratio, the emissions from electricity and heat production are shown separately. In the second ratio, the emissions from electricity and heat have been allocated to final consuming sectors in proportion to the electricity and heat consumed by those sectors.

Key categories

It is good practice for each inventory agency to identify its national key source categories in a systematic and objective manner, by performing a quantitative analysis of the relationships between the level and the trend of each source category's emissions and total national emissions.

In this publication, a **Tier 1 Level Assessment** based on CO₂ emissions from fuel combustion is presented in Table 3 for each country and region for the most recent year of data. The contribution of each category to the total national inventory level is calculated as follows:

$$\begin{aligned} \text{Category Level Assessment} &= \\ \text{Category Estimate} / \text{Total Estimate} \\ L_x &= E_x / E \end{aligned}$$

Where:

L_x is the Level Assessment for category x in the most recent year of data

E_x is the Category estimate - the CO₂ emissions estimate of category x in the most recent year of data

E is the Total estimate - the total estimated inventory GHG in the most recent year of data.

The value of the source category Level Assessment is calculated separately for each category, and the cumulative sum of all the entries is calculated.

Macroeconomic drivers of CO₂ emissions trends

Tables and graphs for drivers refer to the decomposition of CO₂ emissions into four driving factors (Kaya identity)⁵, which is generally presented in the form:

$$\text{Kaya identity} \\ C = P (G/P) (E/G) (C/E)$$

where:

C = CO₂ emissions;

P = population;

G = GDP;

E = primary energy consumption.

The identity expresses, for a given time, CO₂ emissions as the product of population, per capita economic output (G/P), energy intensity of the economy (E/G) and carbon intensity of the energy mix (C/E). Because of possible non-linear interactions between terms, the sum of the percentage changes of the four factors, e.g. $(P_y - P_x)/P_x$, will not generally add up to the percentage change of CO₂ emissions $(C_y - C_x)/C_x$. However, relative changes of CO₂ emissions in time can be obtained from relative changes of the four factors as follows:

$$\text{Kaya identity: relative changes in time} \\ C_y/C_x = P_y/P_x (G/P)_y/(G/P)_x (C/E)_y/(C/E)_x$$

where x and y represent for example two different years.

In this publication, the Kaya decomposition is presented as:

$$\text{CO}_2 \text{ emissions and drivers} \\ \text{CO}_2 = P (\text{GDP}/P) (\text{TPES}/\text{GDP}) (\text{CO}_2/\text{TPES})$$

where:

CO₂ = CO₂ emissions;

P = population;

GDP⁶/P = GDP/population;

TPES/GDP⁶ = Total Primary Energy Supply per GDP;

CO₂/TPES = CO₂ emissions per unit TPES.

5. Yamaji, K., Matsushashi, R., Nagata, Y., Kaya, Y., *An integrated system for CO₂/Energy/GNP analysis: case studies on economic measures for CO₂ reduction in Japan*. Workshop on CO₂ reduction and removal: measures for the next century, March 19, 1991, International Institute for Applied Systems Analysis, Laxenburg, Austria.

6. GDP based on purchasing power parities (PPP).

Indices of all terms (1990 = 100 unless otherwise specified) are shown for each country and regional aggregate, both in the Summary tables and in the individual country/region pages (Table 1, Key indicators, and Figure 6, CO₂ emissions and drivers). Note that in its index form, CO₂/TPES corresponds to the Energy Sector Carbon Intensity Index (ESCII)⁷.

The Kaya identity can be used to discuss the primary driving forces of CO₂ emissions. For example, it shows that, globally, increases in population and GDP per capita have been driving upwards trends in CO₂ emissions, more than offsetting the reduction in energy intensity. In fact, the carbon intensity of the energy mix is almost unchanged, due to the continued dominance of fossil fuels - particularly coal - in the energy mix, and to the slow uptake of low-carbon technologies.

However, it should be noted that there are important caveats in the use of the Kaya identity. Most important, the four terms on the right-hand side of equation should be considered neither as fundamental driving forces in themselves, nor as generally independent from each other.

Drivers of electricity generation emissions trends

In this edition, new graphs present the change in CO₂ emissions from electricity generation over time decomposed into the respective changes of four driving factors⁸:

$$\text{CO}_2 \text{ emissions from electricity generation} \\ C = (C/E) (E/ELF) (ELF/EL) (EL)$$

where:

C = CO₂ emissions;

E = fossil fuel inputs to thermal generation;

ELF = electricity output from fossil fuels;

EL = total electricity output;

7. See the IEA publication *Tracking Clean Energy Progress 2016*.

8. M. Zhang, X. Liu, W. Wang, M. Zhou. *Decomposition analysis of CO₂ emissions from electricity generation in China*. Energy Policy, 52 (2013), pp. 159–165.

This can be rewritten as:

$$\text{CO}_2 \text{ emissions from electricity generation} \\ C = (\text{CF}) (\text{EI}) (\text{EFS}) (\text{EL})$$

where:

- C** = CO₂ emissions;
CF = carbon intensity of the fossil fuel mix;
EI = the reciprocal of fossil fuel based electricity generation efficiency;
EFS = share of electricity from fossil fuels;
EL = total electricity output.

This decomposition expresses, for a given time, CO₂ emissions from electricity generation as the product of the carbon intensity of the fossil fuel mix (CF), the reciprocal of fossil fuel based thermal electricity generation efficiency (1/EF), the share of electricity from fossil fuels (EFS) and total electricity output (EL).

However, due to non-linear interactions between terms, if a simple decomposition is used, the sum of the percentage changes of the four factors, e.g. $(C_y - C_x)/C_x$ may not perfectly match the percentage change of total CO₂ emissions $(C_y - C_x)/C_x$. To avoid this, a more complex decomposition method is required. In this case, the logarithmic mean divisia (LMDI) method proposed by Ang (2004)⁹ has been used.

Using this method, the change in total CO₂ emissions from electricity generation (ΔC_{TOT}) between year t and a base year 0 , can be computed as the sum of the changes in each of the individual factors as follows:

$$C_{\text{TOT}} = \Delta C_{\text{CF}} + \Delta C_{\text{EI}} + \Delta C_{\text{EFS}} + \Delta C_{\text{EL}}$$

where:

$$C_{\text{CF}} = L(C^t, C^0) \ln \left(\frac{CF^t}{CF^0} \right)$$

$$C_{\text{EI}} = L(C^t, C^0) \ln \left(\frac{EI^t}{EI^0} \right)$$

$$C_{\text{EFS}} = L(C^t, C^0) \ln \left(\frac{EFS^t}{EFS^0} \right)$$

$$C_{\text{EL}} = L(C^t, C^0) \ln \left(\frac{EL^t}{EL^0} \right)$$

and:

$$L(x, y) = (y - x) / (\ln y - \ln x)$$

This decomposition can be useful when analysing the trends in CO₂ emissions from electricity generation. For instance, it shows that globally, since 1990, the main driver of increased CO₂ emissions from electricity

generation has been increased electricity output, with improvements in the overall thermal efficiency, and the CO₂ intensity of the electricity generation mix being offset by an increase in the share of electricity derived from fossil fuel sources.

However, as is the case with the Kaya decomposition, it should be noted that the four terms on the right-hand side of equation should be considered neither as fundamental driving forces in themselves, nor as generally independent from each other. For instance, substituting coal with gas as a source of electricity generation would likely affect both the CO₂ intensity of the electricity generation mix and the thermal efficiency of generation.

CO₂ emissions per kWh

The indicator: definition

In the total CO₂ emissions per kWh, the numerator presents the CO₂ emissions from fossil fuels consumed for electricity generation, while the denominator presents the total electricity generated, coming from fossil fuels, but also from nuclear, hydro, geothermal, solar, biofuels, etc. As a result, the emissions per kWh vary a lot across countries and from year to year, depending on the generation mix.

In the CO₂ emissions per kWh by fuel:

- Coal includes primary and secondary coal, and coal gases. Peat and oil shale have also been aggregated with coal, where applicable.
- Oil includes oil products (and crude oil for some countries).
- Gas represents natural gas.

Note: Emissions per kWh should be used with caution due to data quality problems relating to electricity efficiencies for some countries.

Methodological choices: electricity-only versus combined electricity and heat

In previous editions of this publication, the IEA had published a combined electricity and heat CO₂ emissions per kWh indicator. The indicator was useful as an overall carbon intensity measure of a country's electricity and heat generating sectors, and it was easy to calculate. However, there were a number of drawbacks. As the efficiency of heat generation is almost always higher than electricity generation, countries with large amounts of district heating (generally colder countries) tended to have a higher efficiency (therefore

9. B. W. Ang, *Decomposition analysis for policymaking in energy: which is the preferred method?*, Energy Policy, 32 (9) (2004), pp. 1131–1139.

Fixed-heat-efficiency approach

$$\text{CO}_2\text{kWh} = \frac{\text{CO}_{2\text{ELE}} + (\text{CO}_{2\text{CHP}} \times \% \text{ from elec.}) + \text{OWNUSE}_{\text{ELE}}}{\text{ELoutput}_{\text{ELE}} + \text{ELoutput}_{\text{CHP}}}$$

where:

$$\% \text{ from elec.} = \frac{\text{CHPinputs} - ((\text{HEoutput}_{\text{CHP}} \times 0.02388) \div \text{EFF}_{\text{HEAT}})}{\text{CHPinputs}}$$

and:

$$\text{OWNUSE}_{\text{ELE}} = \text{OWNUSE} \times \frac{\text{ELoutput}}{\text{ELoutput} + (\text{HEoutput} \div 3.6)}$$

$\text{CO}_{2\text{ELE}}$ = CO₂ emissions from electricity only plants in ktCO₂

$\text{CO}_{2\text{CHP}}$ = CO₂ emissions from CHP plants in ktCO₂

OWNUSE = CO₂ emissions from own use in electricity, CHP and heat plants in ktCO₂

ELoutput = total electricity output from electricity and CHP plants in GWh

ELoutput_{ELE} = electricity output from electricity only plants in GWh

ELoutput_{CHP} = electricity output from CHP plants in GWh

HEoutput = total heat output from CHP and heat plants in TJ

HEoutput_{CHP} = heat output from CHP plants in TJ

CHPinputs = energy inputs to CHP plants in ktoe

EFF_{HEAT} = efficiency of heat generation - assumed to be 0.9 (*i.e.* 90%) except when the observed efficiency of CHP generation is higher than 90%, in which case emissions are allocated using the proportionality approach (EFF_{HEAT} = EFF_{ELEC} = EFF_{CHP}).

lower CO₂ intensity) than warmer countries with less district heating. Further, the applications of a combined indicator for electricity and heat are limited; many users have been searching for an electricity-only CO₂ emissions per kWh indicator.

Unfortunately, it is not possible to obtain such an electricity-only indicator directly from IEA energy balance data without any assumption. In fact, for combined heat and power (CHP) plants, there is only one combined input available. While various methods exist to split this input into separate amounts for electricity and heat generation, none has previously been used by the IEA for the purposes of calculating a CO₂ emissions per kWh indicator.

It would be possible to calculate an electricity-only indicator using data for electricity-only plants, which would not encounter the problem of assigning CHP inputs between electricity and heat. However, this would not allow a fair cross-country comparison; some countries get

a majority of their electricity from CHP, while others from electricity-only plants. As non-thermal renewables are solely electricity-only plants, and over 99% of non-emitting global nuclear generation is from electricity-only plants, then calculating this electricity-only plants indicator would significantly understate the electricity carbon intensity for many countries.

Electricity-only indicator: allocation of emissions from CHP plants

To allocate the CHP input to electricity and heat separately, the simplest method would be a **proportionality approach**, allocating inputs based on the proportion of electricity and heat in the output, also used by the IEA electricity questionnaire. This is equivalent to fixing the efficiency of electricity and heat to be equal. With the advantage of simplicity and transparency, the proportionality approach however tends to overstate electricity efficiency and to understate heat

efficiency. For example, for CHP generation in OECD countries, total efficiency is around 60%. However, total electricity-only plant efficiency is around 41% in OECD countries. Similarly, 60% is quite low for heat generation (given typical heat-only plant efficiencies of 80-95%).

An alternative method to avoid unrealistic efficiencies is a **fixed-heat-efficiency approach**, fixing the efficiency of heat generation to compute the input to heat, and calculating the input to electricity as a residual from the total input. The standard heat efficiency was set to that of a typical heat boiler, 90%.

Implementation problems arise in two cases: i) when the observed efficiency is over 100% (i.e. there are problems in data quality), and ii) when the observed efficiency is between 90% and 100% (the total efficiency may be correct or it may be overstated).

In the first case, when the total efficiency is over 100% because the data are not reported correctly, it is not possible to use the fixed-heat-efficiency approach and by default the proportionality approach was used to allocate the inputs based on the output shares.

In the second case, where the total CHP efficiency was between 90% and 100% (which may or may not indicate a data quality problem), assuming a 90% efficiency for heat generation would incorrectly imply that the efficiency of power generation was equal to or higher than that of heat generation. However, as the real heat efficiency cannot be determined, the proportionality approach was used also here by default.

In general, the fixed-heat-efficiency approach attributes larger emissions to electricity than the proportionality approach, with values much closer to those of electricity-only plants. The IEA has used the fixed-heat-efficiency approach for several editions of its *World Energy Outlook*.

Comparison between electricity-only and combined electricity and heat ratios (2014 data, from the 2016 edition)

For the majority of OECD countries, the electricity-only indicator is not significantly different from the combined electricity and heat indicator, shown in previous editions of this publication and in the online database. For the OECD total in 2014, the electricity-only indicator is 4% higher, while 19 of the OECD's 34 countries saw a difference of 5% or less. Of the 15 countries with differences of more than 5%, 7 countries had large amounts of non-emitting electricity generation, giving them a small ratio to begin

Implied carbon emission factors from electricity generation (CO₂ / kWh) for selected products

Average implied carbon emission factors from electricity generation by product are presented below, for selected products. Those values are given as a complement of the CO₂ emissions per kWh from electricity generation by country presented in the Summary tables. The values below represent the average amount of CO₂ per kWh of electricity produced in OECD member countries between 2011 and 2015. As they are very sensitive to the quality of underlying data, including net calorific values, and of reported input/output efficiencies, they should be taken as indicative; actual values may vary considerably.

Product	gCO ₂ / kWh
Anthracite*	860
Coking coal*	845
Other bituminous coal	870
Sub-bituminous coal	940
Lignite	1020
Gas works gas*	330
Coke oven gas*	390
Blast furnace gas*	2430
Other recovered gases*	1585
Oil shale*	1195
Peat*	765
Natural gas	400
Crude oil*	600
Refinery gas*	460
Liquefied petroleum gases*	540
Kerosene*	655
Gas/diesel oil*	700
Fuel oil	675
Petroleum coke*	940
Municipal waste (non-renew.)*	1195

* The electricity output from these products represents less than 1% of electricity output in the average of OECD member countries for the years 2011-2015. Values will be less reliable and should be used with caution.

with (thus more prone to change). In addition, non-emitting generation is generally electricity-only, and so when the heat-only and heat CHP emissions are removed from the calculation, greater weight is attached to the non-emitting generation, with a lower level for the final indicator.

The countries in the OECD with larger differences are generally coal-intensive countries with large amounts of heat generation. As mentioned, in general, heat plants are more efficient than electricity-only or CHP plants; therefore, excluding heat plants from the calculation increases CO₂ intensity. The same is true if we allocate a high efficiency to the heat part of CHP generation; this decreases the efficiency of the electricity part and thus increases electricity's carbon intensity. Further, CHP and heat plants are more likely to be powered by CO₂-light natural gas while electricity-only plants tend to be powered by CO₂-heavy coal, making the new ratio more CO₂ intensive for these countries.

Specific country examples

The country with the largest difference between the two ratios within the OECD was **Sweden**; in 2014, the electricity only indicator was 64% lower than the combined electricity and heat indicator. This is due to the high share of non-emitting sources such as hydro (42%) and nuclear (also 42%) in Sweden's electricity generation mix.

Similarly, the electricity only indicator for **Norway** in 2014 was 36% lower than the combined indicator, as the vast majority of the electricity output (96%) is from non-emitting hydroelectric generation.

Conversely, for **Estonia** in 2014 the electricity-only indicator was 36% higher than the combined electricity and heat indicator. This can be explained by the fact that the majority of electricity-only generation comes from oil shale, a fuel with a relatively high carbon emission factor, while heat plants (with a relatively

large share of output) are largely fuelled by natural gas and primary solid biofuels.

Another OECD country with a higher electricity-only ratio was **Denmark** (25% higher in 2014). The majority of fossil generation in Denmark is from CHP and the output from these plants is approximately half electricity and half heat. In addition, CHP plants in Denmark have efficiencies of 60-70%. When the heat part of CHP is set to be 90%, the efficiency of the electricity generation is lowered and the indicator is increased.

In many non-member countries, heat data are either zero or not available, which leads to changes of less than 1% in almost 80% of the non-member countries in 2014. The majority of countries which do change are the European and former Soviet Union countries (where district heating is often present).

As **China** has no (reported) CHP generation, the current IEA energy balance shows electricity-only and heat-only plants, not CHP plants. Heat-only plants are in general much more efficient per unit of energy than electricity-only plants and this explains why the electricity-only ratio is 4% higher in 2014.

In the **Russian Federation**, a large amount (25-35% of total power output) comes from heat-only plants, whose relatively efficient generation is excluded from the new ratio. The large amount of heat output generated by CHP plants also explains why the electricity-only ratio is 19% higher in 2014.

The electricity-only indicators calculated for the following non-member countries are also lower than the combined electricity and heat indicator: **Croatia, Kyrgyzstan, Latvia** and **Tajikistan**. This is because their electricity production is mainly or exclusively clean hydro, while their CHP and heat-only production is fossil based. Implementing the electricity-only indicator using the fixed-heat-efficiency approach increased hydro's weight (therefore decreasing the carbon intensity).

7. IEA ESTIMATES: CHANGES UNDER THE 2006 IPCC GUIDELINES

The 2006 IPCC Guidelines methodology: key concepts

This section briefly presents the Tier 1 methodology to estimate CO₂ emissions from fuel combustion based on the *2006 GLs*, outlining the main differences with the *1996 GLs* - used for previous editions of this publication. The focus is on the key points relevant to the IEA estimation. For the complete methodology, the reader should refer to the full IPCC documents.¹⁰

Generally, the Tier 1 estimation of CO₂ emissions from fuel combustion for a given fuel can be summarised as follows:

$$\text{CO}_2 \text{ emissions from fuel combustion} \\ \text{CO}_2 = \text{AD} * \text{NCV} * \text{CC} * \text{COF}$$

where:

- CO₂** = CO₂ emissions from fuel combustion;
- AD** = Activity data;
- NCV** = Net calorific value;
- CC** = Carbon content;
- COF** = Carbon oxidation factor.

Emissions are then summed over all fuels.

While the basic concept of the calculation - the conservation of carbon - is unchanged, the *2006 GLs* differ from the *1996 GLs* in the:

- default **net calorific values** by product;
- default **carbon content** by product;

- default **carbon oxidation factors**;
- treatment of fuels used for **non-energy** purposes;
- **allocation** of fuel combustion emissions across the Energy and IPPU categories.

2006 Guidelines: overview of changes

This section describes the key methodological changes *2006 GLs* for a Tier 1 estimation of CO₂ emissions from fuel combustion, with a short assessment of their impact on results.

Net calorific values

Net calorific values (NCVs) are used to convert the activity data for all the different fuels from "physical" units (e.g. tonnes) to "energy" units (e.g. Joules).

In the *1996 GLs*, country-specific net calorific values were given for primary oil (crude oil and NGL), for primary coal and for a few secondary coal products. These NCVs were based on the average 1990 values of the 1993 edition of the *IEA Energy Balances*.

In the *2006 GLs*, those country-specific NCVs were removed, and one default is provided for each fuel (with upper and lower limits, as done for the carbon content). Large differences were therefore observed for products whose quality varies a lot from country to country, such as primary oil and coal products. Replacing country-specific values with one default value would significantly affect emissions calculations if the default values were used.

10. Both the *1996 GLs* and the *2006 GLs* are available from the IPCC Greenhouse Gas Inventories Programme (www.ipcc-nggip.iges.or.jp).

The IEA CO₂ emissions from fuel combustion estimates are based on the IEA energy balances, computed using time-varying country-specific NCVs. Therefore, they are not affected by changes to the default net calorific values of the 2006 GLs.

Carbon content

Carbon content is the quantity of carbon per unit of energy of a given fuel. Some of the fuel-specific default values for carbon content, called “carbon emission factors” in the 1996 GLs, were revised in the 2006 GLs. In addition, values were added for some fuels not directly mentioned in the 1996 GLs.

As the carbon content may vary considerably for some fuels, the 2006 GLs introduced ranges of values, *i.e.* providing for each fuel a default value with lower and upper limits. The IEA CO₂ emissions are calculated using the IPCC default values.

A summary of the default carbon content values in the two set of guidelines is shown in Table 1. Relative changes between the 2006 GLs and the 1996 GLs range between -13.7% (refinery gas) and + 7.3% (blast furnace gas), although for many fuels the variation is minimal, or zero. Such systematic changes are reflected in Tier 1 CO₂ emissions estimates.

Carbon oxidation factors

A small fraction of the carbon contained in fuels entering the combustion process (typically less than 1-2%) is not oxidised. Under the 1996 GLs, this amount was subtracted from emissions in the calculations by multiplying the calculated carbon content of a fuel by a “fraction of carbon oxidised”. The fraction of carbon oxidised had a value of less than 1.0, which had the effect of reducing the emissions estimate. However, in most instances, emissions inventory compilers had no “real” information as to whether this correction was actually applicable.

Therefore, in the 2006 GLs, it was decided that all carbon is assumed to be emitted by default, unless more specific information is available. Therefore, under the 2006 GLs, the default carbon oxidation factor is equal to 1 for all fuels.

A summary of the default carbon oxidation factors in the two set of guidelines is shown in Table 2. Relative changes from the 1996 GLs and the 2006 GLs are +0.5% for natural gas; +1% for oil, oil products and peat; and +2% for coal. Such changes are reflected in systematic increases in Tier 1 CO₂ emissions estimates.

Table 1. Comparison of default carbon content values*

Kilogrammes / gigajoule

Fuel Type	1996 Guidelines	2006 Guidelines**	Percent Change
Anthracite	26.8	26.8	0.0%
Coking Coal	25.8	25.8	0.0%
Other Bituminous Coal	25.8	25.8	0.0%
Sub-Bituminous Coal	26.2	26.2	0.0%
Lignite	27.6	27.6	0.0%
Patent Fuel	25.8	26.6	+3.1%
Coke oven coke	29.5	29.2	-1.0%
Gas Coke	29.5	29.2	-1.0%
Coal Tar	..	22.0	x
BKB	25.8	26.6	+3.1%
Gas Works Gas	..	12.1	x
Coke Oven Gas	13.0	12.1	-6.9%
Blast Furnace Gas	66.0	70.8	+7.3%
Other recovered gases	..	49.6	x
Peat	28.9	28.9	0.0%
Oil shale	29.1	29.1	0.0%
Natural Gas	15.3	15.3	0.0%
Crude Oil	20.0	20.0	0.0%
Natural Gas Liquids	17.2	17.5	+1.7%
Refinery Feedstocks	20.0	20.0	0.0%
Orimulsion	22.0	21.0	-4.5%
Refinery Gas	18.2	15.7	-13.7%
Ethane	16.8	16.8	0.0%
Liquefied petroleum gases (LPG)	17.2	17.2	0.0%
Motor Gasoline excl. bio	18.9	18.9	0.0%
Aviation Gasoline		19.1	+1.1%
Gasoline type jet fuel		19.1	+1.1%
Kerosene type jet fuel excl. bio	19.5	19.5	0.0%
Other Kerosene	19.6	19.6	0.0%
Gas/Diesel Oil excl. bio	20.2	20.2	0.0%
Fuel Oil	21.1	21.1	0.0%
Naphtha	20.0	20.0	0.0%
Lubricants	20.0	20.0	0.0%
Bitumen	22.0	22.0	0.0%
Petroleum Coke	27.5	26.6	-3.3%
Non-specified oil products	20.0	20.0	0.0%
Other hydrocarbons		20.0	0.0%
White Spirit & SBP		20.0	0.0%
Paraffin Waxes		20.0	0.0%
Industrial Waste	..	39.0	x
Municipal Waste (non-renewable)	..	25.0	x

* “Carbon content” was referred to as the “carbon emission factor” in the 1996 GLs.

** The 2006 GLs also give the lower and upper limits of the 95 percent confidence intervals, assuming lognormal distributions.

Table 2. Comparison of default carbon oxidation factors*

Fuel Type	1996 Guidelines	2006 Guidelines**	Percent Change
Coal	0.980	1.00	+2.0%
Oil and oil products	0.990	1.00	+1.0%
Natural gas	0.995	1.00	+0.5%
Peat **	0.990	1.00	+1.0%

* “Carbon oxidation factor” was referred to as “fraction of carbon oxidised” in the 1996 GLs.

** The 1996 GLs specified a carbon oxidation factor for peat used for electricity generation only.

Treatment of fuels used for non-energy purposes

Many hydrocarbons are used for non-energy purposes e.g. petrochemical feedstocks, lubricants, solvents, and bitumen. In some of these cases, the carbon in the fuel is quickly oxidised to CO₂, in other cases, it is stored (or sequestered) in the product, sometimes for as long as centuries.

In the *1996 IPCC GLs*, Tier 1 Sectoral Approach emissions included emissions from fuels used for non-energy purposes. The share of carbon assumed to be stored (not emitted) was estimated based on default “fractions of carbon stored” (shown for reference in Table 3).

Table 3. Fraction of carbon stored in the 1996 GLs

Fuel Type	1996 Guidelines
Naphtha*	0.8
Lubricants	0.5
Bitumen	1.0
Coal Oils and Tars (from coking coal)	0.75
Natural Gas*	0.33
Gas/Diesel Oil*	0.5
LPG*	0.8
Ethane*	0.8
Other fuels for non-energy use	To be specified

* When used as feedstocks.

Note: this table is included only for reference. CO₂ emissions from fuel combustion in this publication do not include emissions from non-energy use of fuels.

In the *2006 GLs*, all deliveries for non-energy purposes are excluded. Numerically, excluding all non-energy use of fuel from energy sector emissions calculations is equivalent to applying a fraction of carbon stored equal to 1 to all quantities delivered for non-energy purposes.

In the case of a complete greenhouse gas inventory covering all IPCC Source/Sink categories, any emissions associated with non-energy use of fuels would be accounted in another Source/Sink category. However, as this publication only deals with CO₂ emissions from fuel combustion, emissions associated with non-energy use of fuels are not any longer included in the IEA CO₂ emissions estimates.

Within the IEA estimates, the effect of this change is mainly noticeable for countries whose petrochemical sectors are large in comparison to the size of their economies, e.g. the Netherlands.

Allocation of fuel combustion emissions across the Energy and the IPPU sectors

To avoid possible double counting, the *2006 GLs* state that combustion emissions from fuels obtained directly or indirectly from the feedstock for an Industrial Processes and Product Use (IPPU) process will be allocated to the source category in which the process occurs, unless the derived fuels are transferred for combustion in another source category.

In the case of a complete inventory, this reallocation would not affect total emissions. Still, the effect on individual source categories could be quite significant, especially in countries with large IPPU sectors (e.g. the iron and steel, and non-ferrous metals industries).

To provide continuity with previous editions of this publication and to fully account for fuel combustion emissions, the IEA CO₂ emissions from fuel combustion include all emissions from fuel combustion, irrespective of the category of reporting (Energy or IPPU) under the *2006 GLs*.

To ensure comparability with submissions from Parties, an additional online database provides a summary of CO₂ emissions calculated according to the IPCC Reference and Sectoral Approaches, and a breakdown of the fuel combustion emissions which would be reallocated to IPPU under the *2006 GLs*.¹¹

Assessing the overall impact of methodological changes on IEA estimates

Table 4 shows IEA estimates of total CO₂ emissions from fuel combustion for OECD countries, for the 2014 data (from the 2016 edition). Emissions are calculated using: i) the *1996 GLs* Sectoral Approach, methodology as in previous publications, and ii) the *2006 GLs*¹² - which correspond to the data published in this edition.

11. Note that the data available to the IEA do not allow assessing whether fuels derived from IPPU processes are transferred for combustion in another source category.

12. Including the emissions which may be reallocated from Energy to IPPU under the *2006 GLs*.

The overall impact of the change in methodology on the IEA estimates of CO₂ emissions from fuel combustion varies from country to country, mainly depending on the underlying fuel mix and on the relative importance of non-energy use of fuels in the total.

Most countries show a decrease in CO₂ emissions levels under the new methodology, as the reductions due to the removal of non-energy use emissions are generally larger than the systematic increase due to changes in the oxidation factor.

For the year 2014, reductions of 1% or greater are observed for sixty-five countries, with thirteen showing a decrease of 5% or more. The largest relative decreases are observed in countries with high non-energy use of fuels (mainly oil products and natural gas) relative to their total energy consumption: Trinidad and Tobago (-39%), Gibraltar (-17%), Lithuania (-14%), and Singapore, the Netherlands, Belarus and Brunei Darussalam (all -11%). As emissions from non-energy use of fuels are not included in

energy sector emissions under the 2006 GLs, emissions previously attributed to non-energy use of oil products and natural gas are no longer included in IEA CO₂ emissions from fuel combustion estimates for these countries. One country, Curaçao presented a large increase (27%) in 2014. This was due to the inclusion of emissions from reported energy use of bitumen, which had been excluded (considered carbon stored / non-energy use) under the 1996 GLs.

Within the IEA databases, these changes will also be reflected in all indicators derived from CO₂ emissions totals (e.g. CO₂/TPES, CO₂/GDP). Impacts on trends should be visible when the relative weight of the non-energy use of fuels changes in time.

However, as mentioned, most of the methodological changes would not have significant impact in the case of a complete inventory covering all IPCC source/sink categories; in particular, the reallocation of emissions between categories would not affect total emissions estimates, nor the overall trends.

Table 4. Comparison of IEA CO₂ emissions estimates (2014 data, 2016 edition)

MtCO₂

Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change	Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change
World	32903.3	32381.0	-1.6%	Non-OECD Europe and Eurasia			
Annex I Parties	12852.2	12628.4	-2%	Albania	4.3	4.1	-4.7%
Non-Annex I Parties	18932.1	18622.2	-2%	Armenia	5.2	5.2	0.0%
OECD				Azerbaijan	31.3	30.8	-1.6%
Australia	375.2	373.8	-0.4%	Belarus	64.3	57.4	-10.7%
Austria	60.8	60.8	0.0%	Bosnia and Herzegovina	21.2	21.6	1.9%
Belgium	95.0	87.4	-8.0%	Albania	42.2	42.1	-0.2%
Canada	574.6	554.8	-3.4%	Croatia	15.8	15.1	-4.4%
Chile	76.4	75.8	-0.8%	Cyprus ¹³	5.7	5.8	1.8%
Czech Republic	98.4	96.6	-1.8%	Georgia	8.0	7.7	-3.8%
Denmark	34.7	34.5	-0.6%	Gibraltar	0.6	0.5	-16.7%
Estonia	17.5	17.5	0.0%	Kazakhstan	220.3	223.7	1.5%
Finland	46.4	45.3	-2.4%	Kosovo	7.3	7.4	1.4%
France	295.8	285.7	-3.4%	Kyrgyzstan	8.3	8.4	1.2%
Germany	734.6	723.3	-1.5%	Latvia	6.7	6.7	0.0%
Greece	66.4	65.9	-0.8%	Lithuania	12.0	10.3	-14.2%
Hungary	41.3	40.3	-2.4%	FYR of Macedonia	7.3	7.4	1.4%
Iceland	2.0	2.0	0.0%	Malta	2.3	2.3	0.0%
Ireland	33.7	33.9	0.6%	Republic of Moldova	7.2	7.2	0.0%
Israel	66.3	64.7	-2.4%	Montenegro	2.2	2.2	0.0%
Italy	325.7	319.7	-1.8%	Romania	69.0	68.2	-1.2%
Japan	1193.3	1188.6	-0.4%	Russian Federation	1525.3	1467.6	-3.8%
Korea	589.5	567.8	-3.7%	Serbia	37.9	38.1	0.5%
Luxembourg	9.2	9.2	0.0%	Tajikistan	4.6	4.7	2.2%
Mexico	432.1	430.9	-0.3%	Turkmenistan	66.6	67.0	0.6%
Netherlands	166.6	148.3	-11.0%	Ukraine	239.6	236.5	-1.3%
New Zealand	33.2	31.2	-6.0%	Uzbekistan	101.0	97.9	-3.1%
Norway	36.9	35.3	-4.3%	Non-OECD Europe and Eurasia	2516.4	2446.1	-2.8%
Poland	281.3	279.0	-0.8%				
Portugal	43.2	42.8	-0.9%				
Slovak Republic	29.9	29.3	-2.0%				
Slovenia	12.6	12.8	1.6%				
Spain	234.8	232.0	-1.2%				
Sweden	38.7	37.4	-3.4%				
Switzerland	37.7	37.7	0.0%				
Turkey	304.8	307.1	0.8%				
United Kingdom	409.0	407.8	-0.3%				
United States	5235.9	5176.2	-1.1%				
OECD Total	12033.5	11855.6	-1.5%				

13. Please refer to the chapter *Geographical coverage*.

Table 4. Comparison of IEA CO₂ emissions estimates for Non-OECD Countries (2014 data, 2016 edition)MtCO₂

Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change	Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change
Africa				China			
Algeria	126.4	122.9	-2.8%	People's Republic of China	9199.1	9087.0	-1.2%
Angola	19.5	19.3	-1.0%	Hong Kong (China)	47.3	47.9	1.3%
Benin	5.7	5.7	0.0%	China (incl. Hong Kong)	9246.4	9134.9	-1.2%
Botswana	6.8	6.9	1.5%	Non-OECD Americas			
Cameroon	6.0	6.0	0.0%	Argentina	195.3	192.4	-1.5%
Congo	2.7	2.6	-3.7%	Bolivia	18.2	18.3	0.5%
Cote d'Ivoire	4.6	4.7	2.2%	Brazil	492.6	476.0	-3.4%
Dem. Rep. of Congo	9.3	9.4	1.1%	Colombia	73.0	72.5	-0.7%
Egypt	181.1	173.3	-4.3%	Costa Rica	7.1	7.2	1.4%
Eritrea	0.6	0.6	0.0%	Cuba	29.6	29.4	-0.7%
Ethiopia	9.2	9.1	-1.1%	Curaçao	3.7	4.7	27.0%
Gabon	3.5	3.5	0.0%	Dominican Republic	19.5	19.3	-1.0%
Ghana	13.3	13.1	-1.5%	Ecuador	38.7	38.7	0.0%
Kenya	12.3	12.4	0.8%	El Salvador	5.9	5.9	0.0%
Libya	48.1	47.9	-0.4%	Guatemala	16.1	16.1	0.0%
Mauritius	3.9	4.0	2.6%	Haiti	2.7	2.8	3.7%
Morocco	53.0	53.1	0.2%	Honduras	8.7	8.7	0.0%
Mozambique	3.8	3.9	2.6%	Jamaica	7.1	7.2	1.4%
Namibia	3.6	3.6	0.0%	Nicaragua	4.5	4.5	0.0%
Niger	2.0	2.0	0.0%	Panama	10.6	10.6	0.0%
Nigeria	61.9	60.2	-2.7%	Paraguay	5.2	5.2	0.0%
Senegal	6.4	6.3	-1.6%	Peru	48.4	47.8	-1.2%
South Africa	442.3	437.4	-1.1%	Suriname	2.0	2.0	0.0%
South Sudan	13.9	13.3	-4.3%	Trinidad and Tobago	38.0	23.2	-38.9%
Sudan	1.5	1.5	0.0%	Uruguay	6.5	6.3	-3.1%
United Rep. of Tanzania	10.4	10.4	0.0%	Venezuela	155.5	155.0	-0.3%
Togo	1.7	1.7	0.0%	Other Non-OECD Americas	19.9	20.1	1.0%
Tunisia	25.0	25.0	0.0%	Non-OECD Americas	1209.0	1173.9	-2.9%
Zambia	3.3	3.2	-3.0%	Middle East			
Zimbabwe	11.4	11.5	0.9%	Bahrain	31.8	29.7	-6.6%
Other Africa	32.3	31.0	-4.0%	Islamic Republic of Iran	576.1	556.1	-3.5%
Africa	1125.6	1105.3	-1.8%	Iraq	140.2	141.0	0.6%
Asia (excl. China)				Jordan	23.9	24.1	0.8%
Bangladesh	63.9	62.3	-2.5%	Kuwait	88.4	86.1	-2.6%
Brunei Darussalam	7.5	6.7	-10.7%	Lebanon	22.1	22.4	1.4%
Cambodia	6.0	6.1	1.7%	Oman	63.1	59.9	-5.1%
DPR of Korea	37.0	37.8	2.2%	Qatar	82.7	77.6	-6.2%
India	2038.9	2019.7	-0.9%	Saudi Arabia	521.4	506.6	-2.8%
Indonesia	442.3	436.5	-1.3%	Syrian Arab Republic	28.1	27.6	-1.8%
Malaysia	227.5	220.5	-3.1%	United Arab Emirates	175.8	175.4	-0.2%
Mongolia	17.8	18.2	2.2%	Yemen	21.1	21.3	0.9%
Myanmar	19.6	19.6	0.0%	Middle East	1774.7	1727.8	-2.6%
Nepal	5.8	5.9	1.7%				
Pakistan	141.0	137.4	-2.6%				
Philippines	94.5	95.7	1.3%				
Singapore	50.9	45.3	-11.0%				
Sri Lanka	16.5	16.7	1.2%				
Chinese Taipei	260.9	249.7	-4.3%				
Thailand	263.1	243.5	-7.4%				
Viet Nam	143.7	143.3	-0.3%				
Other Asia	41.7	42.1	1.0%				
Asia (excl. China)	3878.8	3807.0	-1.9%				

8. UNITS AND CONVERSIONS

General conversion factors for energy

To:	TJ	Gcal	Mtoe	MBtu	GWh
<i>From:</i>	multiply by:				
terajoule (TJ)	1	2.388x10 ²	2.388x10 ⁻⁵	9.478x10 ²	2.778x10 ⁻¹
gigacalorie (Gcal)	4.187x10 ⁻³	1	1.000x10 ⁻⁷	3.968	1.163x10 ⁻³
million tonnes of oil equivalent (Mtoe)	4.187x10 ⁴	1.000x10 ⁷	1	3.968x10 ⁷	1.163x10 ⁴
million British thermal units (MBtu)	1.055x10 ⁻³	2.520x10 ⁻¹	2.520x10 ⁻⁸	1	2.931x10 ⁻⁴
gigawatt hour (GWh)	3.600	8.598x10 ²	8.598x10 ⁻⁵	3.412x10 ³	1

Conversion factors for mass

To:	kg	t	lt	st	lb
<i>From:</i>	multiply by:				
kilogramme (kg)	1	1.000x10 ⁻³	9.842x10 ⁻⁴	1.102x10 ⁻³	2.205
tonne (t)	1.000x10 ³	1	9.842x10 ⁻¹	1.102	2.205x10 ³
long ton (lt)	1.016x10 ³	1.016	1	1.120	2.240x10 ³
short ton (st)	9.072x10 ²	9.072x10 ⁻¹	8.929x10 ⁻¹	1	2.000x10 ³
pound (lb)	4.536x10 ⁻¹	4.536x10 ⁻⁴	4.464x10 ⁻⁴	5.000x10 ⁻⁴	1

Conversion factors for volume

To:	gal U.S.	gal U.K.	bbl	ft ³	l	m ³
<i>From:</i>	multiply by:					
U.S. gallon (gal U.S.)	1	8.327x10 ⁻¹	2.381x10 ⁻²	1.337x10 ⁻¹	3.785	3.785x10 ⁻³
U.K. gallon (gal U.K.)	1.201	1	2.859x10 ⁻²	1.605x10 ⁻¹	4.546	4.546x10 ⁻³
barrel (bbl)	4.200x10 ¹	3.497x10 ¹	1	5.615	1.590x10 ²	1.590x10 ⁻¹
cubic foot (ft ³)	7.481	6.229	1.781x10 ⁻¹	1	2.832x10 ¹	2.832x10 ⁻²
litre (l)	2.642x10 ⁻¹	2.200x10 ⁻¹	6.290x10 ⁻³	3.531x10 ⁻²	1	1.000x10 ⁻³
cubic metre (m ³)	2.642x10 ²	2.200x10 ²	6.290	3.531x10 ¹	1.000x10 ³	1

Decimal prefixes

10 ¹	deca (da)	10 ⁻¹	deci (d)
10 ²	hecto (h)	10 ⁻²	centi (c)
10 ³	kilo (k)	10 ⁻³	milli (m)
10 ⁶	mega (M)	10 ⁻⁶	micro (μ)
10 ⁹	giga (G)	10 ⁻⁹	nano (n)
10 ¹²	tera (T)	10 ⁻¹²	pico (p)
10 ¹⁵	peta (P)	10 ⁻¹⁵	femto (f)
10 ¹⁸	exa (E)	10 ⁻¹⁸	atto (a)

Tonne of CO₂

The *2006 GLs* and the *UNFCCC Reporting Guidelines on Annual Inventories* both ask that CO₂ emissions be reported in Gg (gigagrammes) of CO₂. A million tonnes of CO₂ is equal to 1 000 Gg of CO₂, so to compare the numbers in this publication with national inventories expressed in Gg, multiply the IEA emissions by 1 000.

Other organisations may present CO₂ emissions in tonnes of carbon instead of tonnes of CO₂. To convert from tonnes of carbon, multiply by 44/12, which is the molecular weight ratio of CO₂ to C.

Energy Data Officer/Statistician

Possible Staff Vacancies

International Energy Agency, Paris, France

The IEA

The International Energy Agency, based in Paris, acts as energy policy advisor to 29 member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Founded during the oil crisis of 1973-74, the initial role of the IEA was to co-ordinate measures in times of oil supply emergencies. As energy markets have changed, so has the IEA. Its mandate has broadened to incorporate the “Three E’s” of balanced energy policy making: energy security, economic development and environmental protection. Current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major consumers and producers of energy like China, India, Russia and the OPEC countries.

The Energy Data Centre, with a staff of around 30 people, provides a dynamic environment for young people just finishing their studies or with one to two years of work experience.

Job description

The data officers/statisticians compile, verify and disseminate information on all aspects of energy including production, transformation and consumption of all fuels, energy efficiency indicators, CO₂ emissions, and energy prices and taxes. The data officers are responsible for the production of data sets through receiving, reviewing and inputting data submissions from member countries and other sources. They check for completeness, correct calculations, internal consistency, accuracy and consistency with definitions. Often this entails proactively investigating and helping to resolve anomalies in collaboration with national administrations. The data officers/statisticians also design and implement computer macros used in the preparation of their energy statistics publication(s) alongside analysis of the data.

Principal qualifications

- University degree in a topic relevant to energy, or statistics. We currently have staff with degrees in mathematics, statistics, information technology, economics, engineering, physics, environmental studies, etc.
- Experience in the basic use of databases and computer software. Experience in Visual Basic is an advantage.
- Ability to work accurately, pay attention to detail and work to deadlines; ability to deal simultaneously with a wide variety of tasks and to organise work efficiently.
- Good communication skills; ability to work well in a team and in a multicultural environment, particularly in liaising with contacts in national administrations and industry; ability to understand, and communicate data.
- An excellent written and oral command of English; knowledge of other languages would be an asset.
- Some knowledge of energy industry operations and terminology would also be an advantage, but is not required.

Nationals of any IEA member country are eligible for appointment. Basic salaries start at 3 300 euros per month. The possibilities for advancement are good for candidates with appropriate qualifications and experience. Tentative enquiries about future vacancies are welcomed from men and women with relevant qualifications and experience. Applications in English, accompanied by a curriculum vitae, should be sent to:

Office of Management and Administration
International Energy Agency
31-35 rue de la Fédération
75739 Paris Cedex 15, France

Online Data Services

Users can instantly access not only all the data published in this book, but also all the time series used for preparing this publication and all the other statistics publications of the IEA. The data are available online, either through annual subscription or pay-per-view access. More information on this service can be found on our website: <http://data.iea.org>

Nine Annual Publications

■ World Energy Statistics 2017

World Energy Statistics presents comprehensive world energy statistics on all energy sources – coal, gas, oil, electricity, renewables and waste. It covers energy supply and consumption for 150 countries and regions, including all OECD countries, over 100 other key energy producing and consuming countries, as well as world totals. The book includes detailed tables by country in original units for the year 2015, and summary time series on production, trade, and final consumption by sector. It also presents provisional 2016 supply data for OECD countries, and initial 2016 estimates for non-OECD countries' production and trade of natural gas, primary coal and oil.

Published August 2017 - Price: Print €120; PDF €96

■ World Energy Balances 2017

World Energy Balances presents comprehensive energy balances for all the world's largest energy producing and consuming countries. It contains detailed data on the supply and consumption of energy for 150 countries and regions, including all OECD countries, over 100 other key energy producing and consuming countries, as well as world totals. The book includes graphs and detailed data by country for all energy sources – coal, gas, oil, electricity, renewables and waste - expressed in balance format, for the year 2015. Alongside this, there are summary time series on production, trade, final consumption by sector, as well as key energy and economic indicators. The volume also presents provisional 2016 supply data for OECD countries, and initial 2016 estimates for non-OECD countries' production and trade of natural gas, primary coal and oil.

Published August 2017 - Price: Print €120; PDF €96

■ Coal Information 2017

Coal Information provides a comprehensive review of historical and current market trends in the world coal sector, including 2016 provisional data. It provides a review of the world coal market in 2015, alongside a statistical overview of developments, which covers world coal production and coal reserves, coal demand by type, coal trade and coal prices. A detailed and comprehensive statistical picture of historical and current coal developments in the 35 OECD member countries, by region and individually is presented in tables and charts. Complete coal balances and coal trade data for selected years are presented on 22 major non-OECD coal-producing and -consuming countries, with summary statistics on coal supply and end-use statistics for about 40 countries and regions worldwide.

Published August 2017 - Price: Print €165; PDF €132

■ Electricity Information 2017

Electricity Information provides a comprehensive review of historical and current market trends in the OECD electricity sector, including 2016 provisional data. It provides an overview of the world electricity developments in 2015 covering world electricity and heat production, input fuel mix, supply and consumption, and electricity imports and exports. More detail is provided for the 35 OECD countries with information covering production, installed capacity, input energy mix to electricity and heat production, consumption, electricity trades, input fuel prices and end-user electricity prices. It provides comprehensive statistical details on overall energy consumption, economic indicators, electricity and heat production by energy form and plant type, electricity imports and exports, sectoral energy and electricity consumption, as well as prices for electricity and electricity input fuels for each country and regional aggregate.

Published August 2017 - Price: Print €150; PDF €120

■ Natural Gas Information 2017

Natural Gas Information is a detailed reference work on gas supply and demand covering not only the OECD countries but also the rest of the world; this publication contains essential information on LNG and pipeline trade, gas reserves, storage capacity and prices. The main part of the book concentrates on OECD countries, showing a detailed supply and demand balance for each country and for the three OECD regions: Americas, Asia-Oceania and Europe, as well as a breakdown of gas consumption by end user. Import and export data are reported by source and destination.

Published August 2017 - Price: Print €165; PDF €132

■ Oil Information 2017

Oil Information is a comprehensive reference book on current developments in oil supply and demand. This publication contains key data on world production, trade, prices and consumption of major oil product groups, with time series back to the early 1970s. Its core consists of a detailed and comprehensive picture of oil supply, demand, trade, production and consumption by end-user for each OECD country individually and for the OECD regions. Trade data are reported extensively by origin and destination.

Published August 2017 - Price: Print €165; PDF €132

■ Renewables Information 2017

Renewables Information provides a comprehensive review of historical and current market trends in OECD countries, including 2015 provisional data. It provides an overview of the development of renewables and waste in the world over the 1990 to 2015 period. A greater focus is given to the OECD countries with a review of electricity generation and capacity from renewable and waste energy sources, including detailed tables. However, an overview of developments in the world and OECD renewable and waste market is also presented. The publication encompasses energy indicators, generating capacity, electricity and heat production from renewable and waste sources, as well as production and consumption of renewables and waste.

Published August 2017 - Price: Print €110; PDF €88

■ CO₂ Emissions from Fuel Combustion 2017

In recognition of the fundamental importance of understanding energy related environmental issues, the IEA's *CO₂ Emissions from Fuel Combustion* provides a full analysis of emissions stemming from energy use. This annual publication has become an essential tool for analysts and policy makers in many international fora such as the Conference of the Parties, which will be meeting in Bonn, Germany, from 7 to 16 November 2017. The data in this book are designed to assist in understanding the evolution of the emissions of CO₂ from 1971 to 2015 for 150 countries and regions by sector and by fuel. Emissions were calculated using IEA energy databases and the default methods and emission factors from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Published November 2017 - Price: Print €165; PDF €132

■ Energy Efficiency Indicators Highlights 2017

Energy Efficiency Indicators Highlights is designed to help understand what drives final energy use in IEA member countries in order to improve and track national energy efficiency policies. It provides the first comprehensive selection of data that the IEA has been collecting each year after its member states recognised in 2009 the need to better monitor energy efficiency policies. The report includes country-specific analysis of end uses across the largest sectors – residential, services, industry and transport. It answers questions such as:

- What are the largest drivers for energy use trends in each country?
- Was energy saved because of efficiency progress over time?
- How much energy is used for space heating, appliances or cooking?
- What are the most energy-intensive industries?

Improving energy efficiency is a critical step for governments to take to move towards a sustainable energy system. This report highlights the key role of end-use energy data and indicators in monitoring progress in energy efficiency around the world.

Published December 2017 - Free pdf

Two Quarterlies

■ Oil, Gas, Coal and Electricity

Oil, Gas, Coal and Electricity provides detailed and up-to-date quarterly statistics on oil, natural gas, coal and electricity for the OECD countries. Oil statistics cover production, trade, refinery intake and output, stock changes and consumption for crude oil, NGL and nine selected product groups. Statistics for electricity, natural gas and coal show supply and trade. Oil and coal import and export data are reported by origin and destination. Gas imports and exports data are reported by entries and exits of physical flows. Moreover, oil and coal production are reported on a worldwide basis.

Published Quarterly - Price €120, annual subscription: Print €380; PDF €304

■ Energy Prices and Taxes

Energy Prices and Taxes responds to the needs of the energy industry and OECD governments for up-to-date information on prices and taxes in national and international energy markets. It contains crude oil import prices by crude stream, industry prices and consumer prices. The end-user prices for OECD member countries cover main oil products, gas, coal and electricity. Every issue includes full notes on sources and methods and a description of price components in each country. Time series availability varies with each data series.

Published Quarterly - Price €120, annual subscription: Print €380; PDF €304

Electronic Editions

■ CD-ROMs and Online Data Services

To complement its publications, the Energy Data Centre produces CD-ROMs containing the complete databases which are used for preparing the statistics publications. Built-in software allows you to access and manipulate all these data in a very user-friendly manner and includes graphic facilities. These databases are also available on the internet from our online data service.

Annual CD-ROMS / Online Databases

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|--|-----------------------------|
| ■ World Energy Statistics 2017 | Price: €800 (single user) |
| ■ World Energy Balances 2017 | Price: €800 (single user) |
| ■ World Energy Statistics and Balances 2017
<i>(Combined subscription of the above two series)</i> | Price: €1 400 (single user) |
| ■ Coal Information 2017 | Price: €550 (single user) |
| ■ Electricity Information 2017 | Price: €550 (single user) |
| ■ Natural Gas Information 2017 | Price: €550 (single user) |
| ■ Oil Information 2017 | Price: €550 (single user) |
| ■ Renewables Information 2017 | Price: €400 (single user) |
| ■ CO ₂ Emissions from Fuel Combustion 2017 | Price: €550 (single user) |

Quarterly CD-ROMs / Online Databases

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|---------------------------|---|
| ■ Energy Prices and Taxes | Price: (four quarters) €900 (single user) |
|---------------------------|---|

A description of these services is available on our website: <http://data.iea.org>

Other Online Services

■ The Monthly Oil Data Service

The IEA *Monthly Oil Data Service* provides the detailed databases of historical and projected information which is used in preparing the IEA's monthly *Oil Market Report* (OMR). The IEA Monthly Oil Data Service comprises three packages available separately or combined as a subscriber service on the Internet. The data are available at the same time as the official release of the Oil Market Report.

The packages include:

- | | |
|---------------------------------------|------------------------------------|
| ■ Supply, Demand, Balances and Stocks | Price: €6 150 (single user) |
| ■ Trade | Price: €2 050 (single user) |
| ■ Field-by-Field Supply | Price: €3 080 (single user) |
| ■ Complete Service | Price: €9 200 (single user) |

A description of this service is available on our website: www.iea.org/statistics/mods

■ The Monthly Gas Data Service

The service provides monthly natural gas data for OECD countries:

- Supply balances in terajoules and cubic metres;
- Production, trade, stock changes and levels where available, gross inland deliveries, own use and losses;
- Highly detailed trade data with about 50 import origins and export destinations;
- LNG trade detail available from January 2002,
- From 2011 onwards, transit volumes are included and trade data corresponds to entries/exits.

The databases cover the time period January 1984 to current month with a time lag of two months for the most recent data.

- Monthly Gas Data Service: Natural Gas Balances & Trade
Historical plus 12 monthly updates

Price: €800 (single user)

For more information consult: www.iea.org/statistics/mgds

Moreover, the IEA statistics website contains a wealth of free statistics covering oil, natural gas, coal, electricity, renewables, energy-related CO₂ emissions and more for 150 countries and regions and historic data for the last 20 years. It also contains Sankey flows to enable users to explore visually how a country's energy balance shifts over up to 40 years, starting with production and continuing through transformation to see important changes in supply mix or share of consumption. The IEA Energy Atlas offers panoramas on every aspect of energy on a global basis and for 150 individual countries, with interactive maps and customisable charts that detail and compare a host of data based on the Agency's authoritative statistics. The website also includes free headline energy data in excel format for all OECD countries and global regions from 1971 onwards as well as for Association countries from 1990 onwards.

The IEA statistics website can be accessed at www.iea.org/statistics/

Online bookshop

www.iea.org/books

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Market Report Series

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

IEA/OECD possible corrigenda on: www.oecd.org/about/publishing/corrigenda.htm

IEA Publications

International Energy Agency

Website: www.iea.org

Contact information: www.iea.org/aboutus/contactus

Typeset by the IEA, October 2017

In recognition of the fundamental importance of energy-related environmental issues, the latest information on CO₂ emissions from fuel combustion – level, growth, source and geographic distribution – will be essential to analysts and policy makers in many international fora. To provide input to and in support of the UN Conference of Parties, which will be meeting in Bonn, Germany, from 7 to 16 November 2017, the IEA is making available for free download the “Highlights” version of its *CO₂ Emissions from Fuel Combustion*.

This annual publication contains, for more than 150 countries and regions:

- estimates of CO₂ emissions from 1971 to 2015;
- selected indicators such as CO₂/GDP, CO₂/capita and CO₂/TPES;
- a decomposition of CO₂ emissions into driving factors.

Emissions were calculated using IEA energy databases and the default methods and emission factors from the 2006 *IPCC Guidelines for National Greenhouse Gas Inventories*.

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