Recent trends in OECD CO₂ emissions from fuel combustion

Overall emissions

Total OECD CO₂ emissions from fuel combustion were broadly stable in 2013 (Figure 1) at 12 GtCO₂. Across the OECD, increases in CO₂ emissions from Coal (+1%) and Gas (+2%) were offset by a decrease in emissions from Oil (-1%).

Within the OECD regions, CO₂ emissions in OECD Americas grew (+2%), in OECD Europe fell (-2%), while in OECD Asia Oceania, emissions remained approximately stable between 2012 and 2013.
Emissions by source

In the OECD as a whole, in 2013, Oil was responsible for the largest share of CO₂ emissions from fuel combustion (39%), followed by Coal (34%) and Gas (26%). Figure 2 shows how the sources of emissions vary for the top-ten emitting OECD countries.

Figure 2: CO₂ emissions from fuel combustion by source in 2013
top-10 OECD emitting countries
**CO₂ emissions and drivers**

In 2009, during the economic crisis, OECD CO₂ emissions from fuel combustion declined to their lowest level since the mid-1990s. Although OECD emissions have rebounded since then, as of 2013, they remained below pre-crisis levels.

Between 2009 and 2013, CO₂ emissions increased by 2%, with a relatively stable carbon intensity of the mix (CO₂/TPES), and an economic output increase (GDP/population: +5%) more than offset by a decline in the energy intensity of economic output (TPES/GDP: -6%)\(^1\). Declines in energy intensity can be driven by improvements in efficiency, structural changes in the economy and variations in weather patterns, among other factors.

Over 1990-2013, effects of the increased economic output (GDP/population: +38%; and population +18%) were partly offset by significant decoupling of economic growth from energy consumption (TPES/GDP: -28%) and by a mild decline of the carbon intensity of the mix (CO₂/TPES: -7%) – linked to a continuing reliance on fossil fuels as a source of energy. Compared with their 1990 levels, OECD CO₂ emissions from fuel combustion were 9% higher in 2013.

---

\(1\). CO₂ emissions from fuel combustion can be broken down into the product of four driving factors: population, per-capita economic output (GDP/population), energy intensity of the economy (TPES/GDP) and carbon intensity of the energy mix (CO₂/TPES), through a decomposition known as the "Kaya identity":

\[
\text{CO}_2 = \frac{\text{CO}_2}{\text{TPES}} \times \frac{\text{TPES}}{\text{GDP}} \times \frac{\text{GDP}}{\text{population}} \times \text{population}. 
\]
Emissions by sector

In 2013, power generation was the largest emitting sector (40% in the region and above 45% in about ten countries), followed by transport (28%). Emissions from electricity and heat generation were driven almost equally by industry, residential and services. In 2013, the OECD produced 10,800 TWh of electricity (180% more than in 1971), of which 61% was derived from fossil fuels. OECD electricity generation produced 432 gCO₂/kWh in 2013, just 76 gCO₂ less than in 1990.

* Other includes agriculture/forestry, fishing, energy industries other than electricity and heat generation, and other emissions not specified elsewhere.

Released in July 2015.


Further information on CO₂ emissions statistics is available at:
www.iea.org/statistics/topics/CO2emissions

Queries should be addressed to: emissions@iea.org

In addition, a wide range of free energy statistics can be accessed at:
www.iea.org/statistics

Please note that all IEA publications and data are subject to specific conditions that limit their use and distribution. These terms and conditions are available online at www.iea.org/t&c/.