

Methodology for calculating CO₂ emissions from energy use

Carbon emissions from primary energy use are estimated by applying the Default CO₂ Emission Factors for Combustion to the consumption of each energy product type (coal, natural gas and various oil products) from the list of IPCC emission factors¹. Biofuels are considered as not emitting CO₂, consistent with the practice of the IEA. Second, the revised method takes account of fuel consumption used for non-combustion purposes, such as the use of oil products and natural gas in the petrochemicals industry or of oil to produce bitumen for road construction. Estimates of the share of non-combusted fossil fuels taken from the IEA's energy balances² are subtracted from the total consumption of fossil fuels before applying the relevant emission factors.

In addition to the carbon emissions calculated from our primary energy consumption figures, carbon emissions from flared natural gas are now also estimated and included in the total. These are calculated using data series on volumes of gas flared from two sources: Cedigaz up to 2012, and the Payne Institute for Public Policy, Colorado School of Mines from 2013 onward. Payne Institute's data include flaring from upstream, downstream oil and gas, while Cedigaz' include flaring from upstream only. Volumes of gas flared have been standardised using a Gross Calorific Value (GCV) of 40 MJ/m³. The IPCC Default CO₂ Emission Factor for Combustion for natural gas (56,100 kg CO₂ per TJ) is used and perfect combustion has been assumed. These emissions represent around 1% of total CO₂ emissions.

¹ IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T., and Tanabe K. (eds). Published: IGES, Japan; available at <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>

² 'Energy Statistics of OECD Countries', 'Energy Balances of OECD Countries', 'Energy Statistics of Non-OECD Countries, and 'Energy Balances of Non-OECD Countries'