

GREENHOUSE GAS EMISSIONS BY SECTOR ELABORATE 1 LESSON 12



Dairy Industry Emissions Data

Table 4.1 Milk production and related GHG emissions – global averages:

Commodities	Total production (Million tonnes)	GHG emissions (Million tonnes CO ₂ -eq.) *	GHG emissions (kg CO ₂ -eq. per kg of product) *	Contribution to total anthropogenic emissions in 2007 (%) *
Milk: production, processing and transport	553	1 328	2.4	2.7

4.5.2 Energy consumption

The amount of energy used for milk transportation and processing depends on:

- the distance between the production site and the dairy plant;
- the type of processing;
- the type of packaging;
- the distance and type of transport (e.g. cooled vs. non cooled lorries) between the dairy plant and the retailer; and
- the technical standards of the dairy plant.

Clearly, GHG emissions from a given dairy plant depend on the type of energy used, and how it is produced in the region. In Europe, on average, GHG emissions related to processing are estimated at 0.155 kg of CO₂-eq. per kilogram of milk at farm gate (0.155 kg CO₂-eq./kg milk). Of this, 0.086 kg of CO₂-eq. is from processing. Packaging accounts for 0.038 kg of CO₂-eq., and transport (from farm to dairy and dairy to retail) adds another 0.030 kg of CO₂-eq./kg milk (Table 4.8).



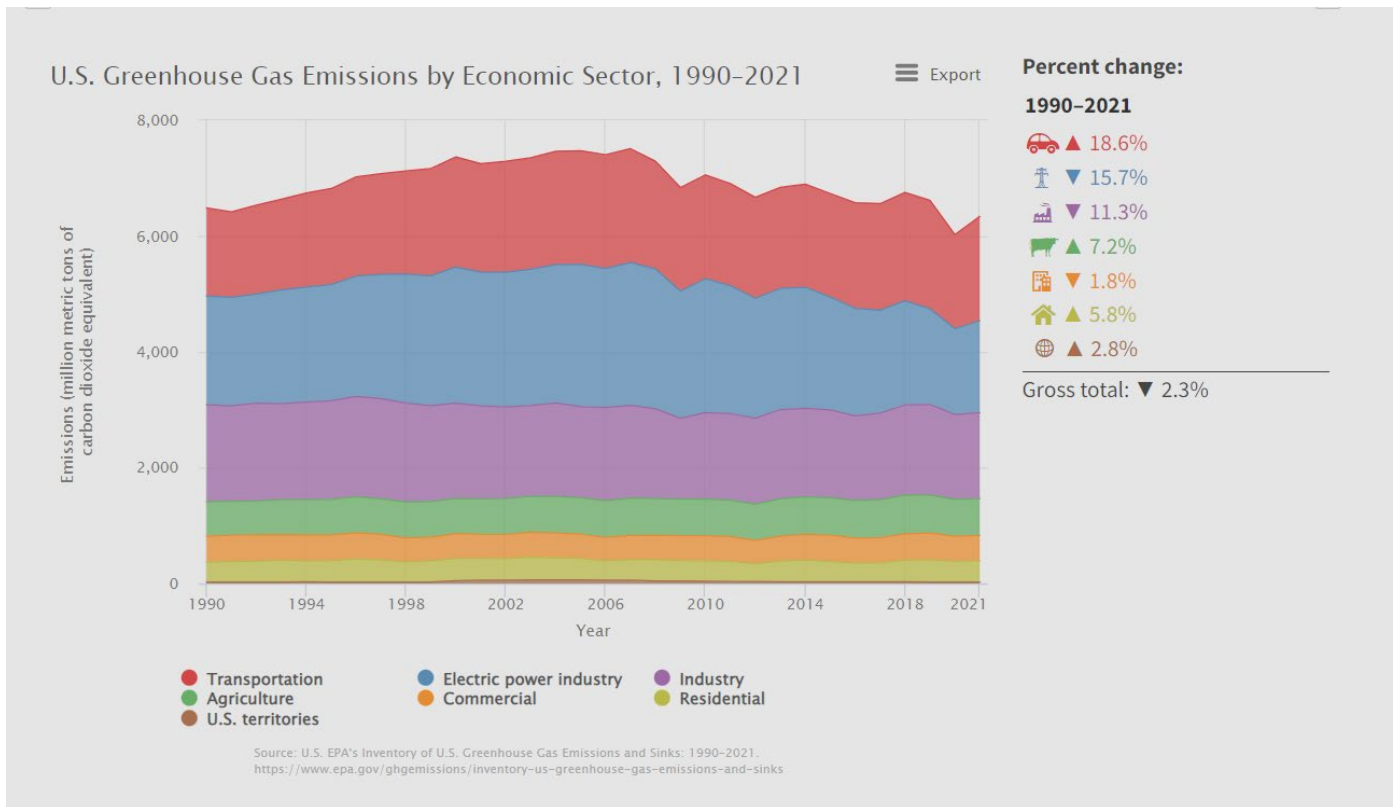
Table 4.8. Estimated energy use and GHG emissions for milk transport, processing and production of packaging: average values for Europe

	CO ₂ emissions (kg CO ₂ -eq./kg milk at farm gate)
Transport from farm to dairy	0.016
Processing in dairy	0.086
Packaging	0.038
Transport from dairy to retail	0.014
Total	0.155

The production of packaging material is particularly energy intensive and therefore boosts emissions (Table 4.8).

From: <https://www.fao.org/3/k7930e/k7930e00.pdf>

EPA Emissions Data by Sector

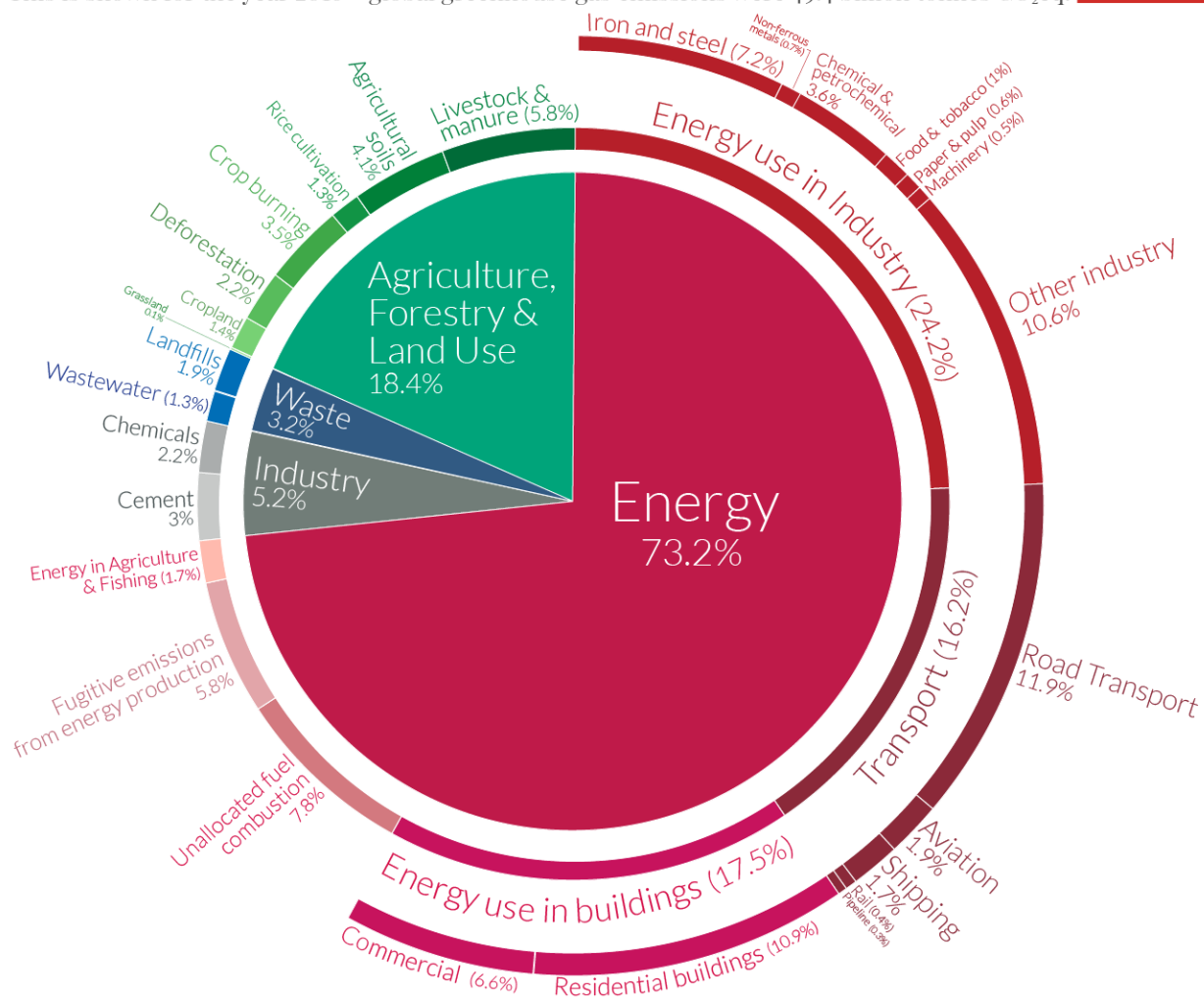


From: <https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/econsect/all>

Our World in Data Emissions by Sector

Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



OurWorldinData.org – Research and data to make progress against the world's largest problems.

Source: Climate Watch, the World Resources Institute (2020).

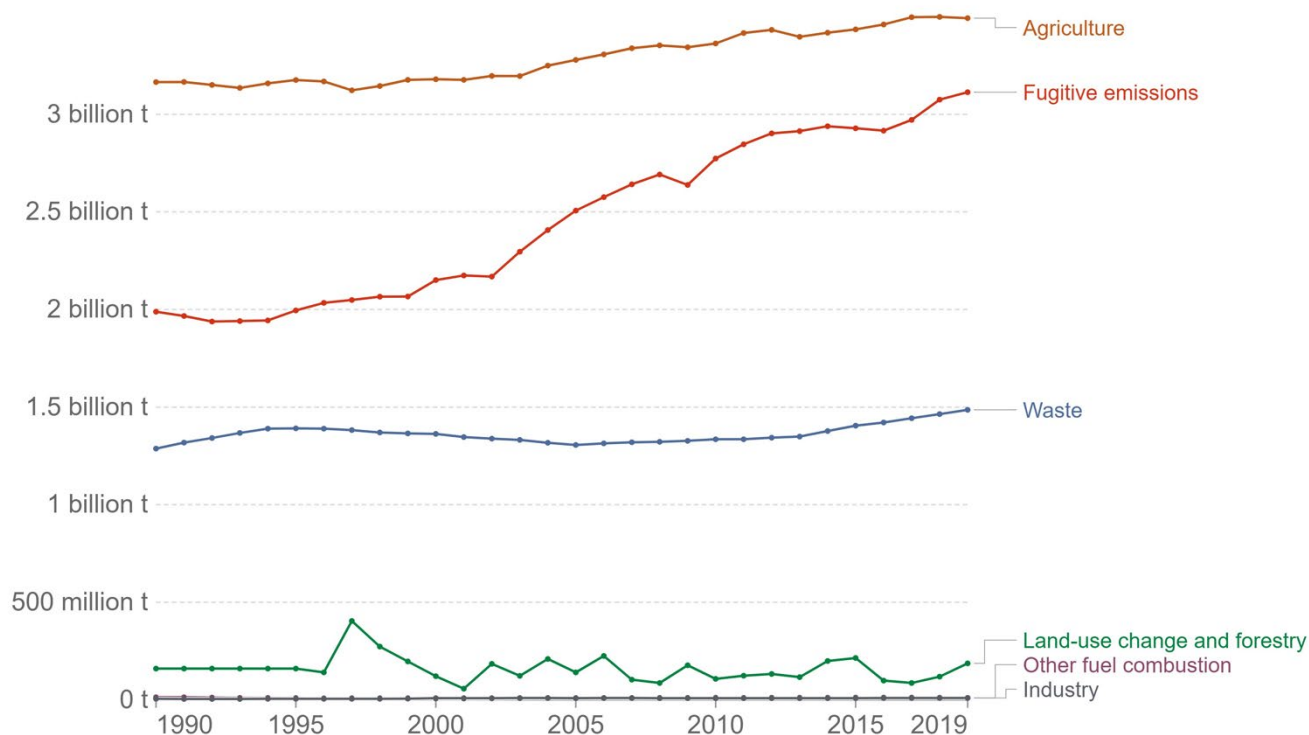
Licensed under CC-BY by the author Hannah Ritchie (2020).

Fugitive emissions are emissions from unintentional or intentional release of greenhouse gases (GHG) to the atmosphere. These usually occur due to leaks of gases or vapors from infrastructure such as appliances, storage tanks, pipelines, wells, or other pieces of equipment – mostly from industrial activities.

Methane emissions by sector, World

Methane (CH₄) emissions are measured in tonnes of carbon dioxide-equivalents¹.

Our World
in Data



Source: Our World in Data based on Climate Analysis Indicators Tool (CAIT).
OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY

1. Carbon dioxide-equivalents (CO₂eq): Carbon dioxide is the most important greenhouse gas, but not the only one. To capture all greenhouse gas emissions, researchers express them in 'carbon dioxide-equivalents' (CO₂eq). This takes all greenhouse gases into account, not just CO₂. To express all greenhouse gases in carbon dioxide-equivalents (CO₂eq), each one is weighted by its global warming potential (GWP) value. GWP measures the amount of warming a gas creates compared to CO₂. CO₂ is given a GWP value of one. If a gas had a GWP of 10 then one kilogram of that gas would generate ten times the warming effect as one kilogram of CO₂. Carbon dioxide-equivalents are calculated for each gas by multiplying the mass of emissions of a specific greenhouse gas by its GWP factor. This warming can be stated over different timescales. To calculate CO₂eq over 100 years, we'd multiply each gas by its GWP over a 100-year timescale (GWP100). Total greenhouse gas emissions – measured in CO₂eq – are then calculated by summing each gas' CO₂eq value.

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From: <https://ourworldindata.org/emissions-by-sector>