Towards resilient and sustainable industries in regions

Industrial regions will have to undergo deep transformations to meet climate neutrality goals.

In OECD countries, the manufacturing sector (including oil refineries and the transformation industry) is the third-largest contributor to territorial emissions after the energy and transport sectors, accounting for 20% of total emissions (Crippa et al., 2021), while accounting for 12% of total employment. With a 27% reduction in GHG emissions since 1970, manufacturing is the sector with the largest decline in emissions. This can be explained by a drop in employment driven in part by globalisation, as in many OECD countries manufacturing industries have been relocated offshore. Metropolitan regions experienced the largest decline in manufacturing emissions (-31%) but, in remote regions, they increased by 7%. Within the manufacturing industry, emissions are particularly concentrated in four specific sectors: the manufacture of coke and petroleum products; of chemicals and chemical products; of non-metallic mineral products (i.e. cement); and of basic metals (i.e. steel). In EU27 countries, these 4 sectors account for 80% of total manufacturing GHG emissions. These sectors can drive the differences in manufacturing emissions observed within OECD countries. For example, in the Netherlands, the manufacturing emissions per unit of gross value added (GVA) in the region of Zeeland are almost seven times higher than in Limburg. Although the manufacturing industry accounts for more than 20% of total GVA in both regions, emissions in Zeeland are particularly high due to the manufacture of chemicals and chemical products (Figure 2.14).

The transition to climate neutrality will affect more strongly regional economies with high employment shares in emission-intensive manufacturing sectors. In European OECD countries, the regions with the highest share of employment in the four most-emitting manufacturing sectors are Northwest (Czech Republic), Rhineland-Palatinate, Saxony-Anhalt (Germany) and North Middle Sweden, where such sectors account for around 7% of total regional employment (Eurostat, 2021). Emissions are particularly high in specific regions. For example, emissions in the four most-emitting manufacturing sectors are concentrated in Lower Saxony, North Rhine-Westphalia and Rhineland-Palatinate for Germany (OECD, 2022) (Figure 2.16).

The manufacturing sector also tends to be more energy-intensive compared to other sectors. In 2019, for OECD countries, manufacturing accounted for 18% of the total final energy consumption, 30% of natural gas consumption and 25% of electricity consumption (IEA, 2022b). Manufacturing industries heavily relying on energy are unevenly distributed within countries, making some regions' economies more vulnerable to increases in energy prices. Within OECD countries, the most energy-intensive region consumes on average 16 times more energy per unit of GVA than the least energy-intensive region. This occurs as the most energy-intensive manufacturing sectors can be very concentrated in a few places. For example, in Greece, the Netherlands and Norway, most of the national employment in the manufacturing of coke and refined petroleum products is concentrated in one single region (Peloponnese, South Holland and Western Norway) (Figure 2.15).

Definition

Manufacturing industry emissions in OECD regions were estimated using EDGAR, version 6 (Crippa et al., 2021) and expressed in CO_2-eq. Manufacturing industry emissions include combustion for manufacturing, oil refineries and transformation industry, chemical processes, non-metallic minerals production, iron and steel production, non-ferrous metals production and non-energy use of fuels and solvents and products use.

Emissions in **key manufacturing sectors** in European regions were estimated using EU-ETS matched with the ORBIS database (OECD, 2022). Emissions are expressed in CO_2-eq and include CO_2, N_2O, CH_4 and F-gases. Key manufacturing sectors refer to the manufacture of coke and refined petroleum products (NACE 19), chemicals and chemical products (NACE 20), non-metallic mineral products (NACE 23) and basic metals (NACE 24).

See Annex C for more details.

Sources

Crippa, M. et al. (2021), *EDGAR v6.0 Greenhouse Gas Emissions*, Joint Research Centre (JRC), European Commission, *http://data.europa.eu/89h/97a67d67-c62e-4826-b873-9d972c4f670b*.

Eurostat (2021), "Structural Business Statistics data by NUTS 2 regions and NACE Rev. 2 (from 2008 onwards)", *https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=sbs_r_nuts06_r2&lang=en*.

IEA (2022a), "OECD - Natural gas supply and consumption", *IEA Natural Gas Information Statistics (database)*, *https://doi.org/10.1787/data-00481-en*.

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OECD (2022), "Regional industrial transitions to climate neutrality: Identifying vulnerable regions", OECD, Paris.

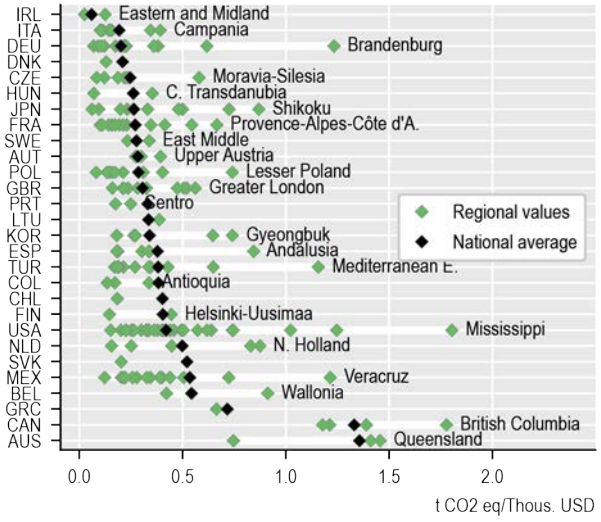
Figure notes

2.14: 2017 for JPN. Only regions where the GVA in manufacturing is higher than USD 10 billion (constant prices, constant purchasing power parity [PPP], base year 2015) are represented.

2.16: The top four high-emission manufacturing sectors are the manufacture of coke and refined petroleum products (NACE 19), of chemicals and chemical products (NACE 20), of non-metallic mineral products (NACE 23) and of basic metals (NACE 24).

2.14. Regional disparities in manufacturing emissions intensity

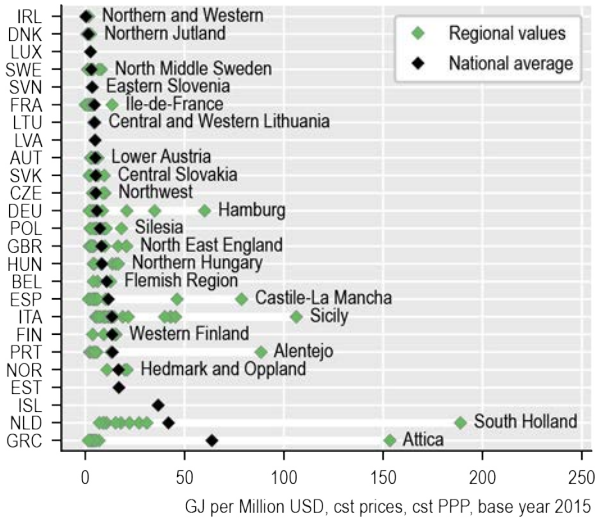
Emissions per unit of GVA in manufacturing, 2018, OECD large regions (TL2)



StatLink https://stat.link/3jlc2t

2.15. Manufacturing energy intensity is concentrated in a few regions

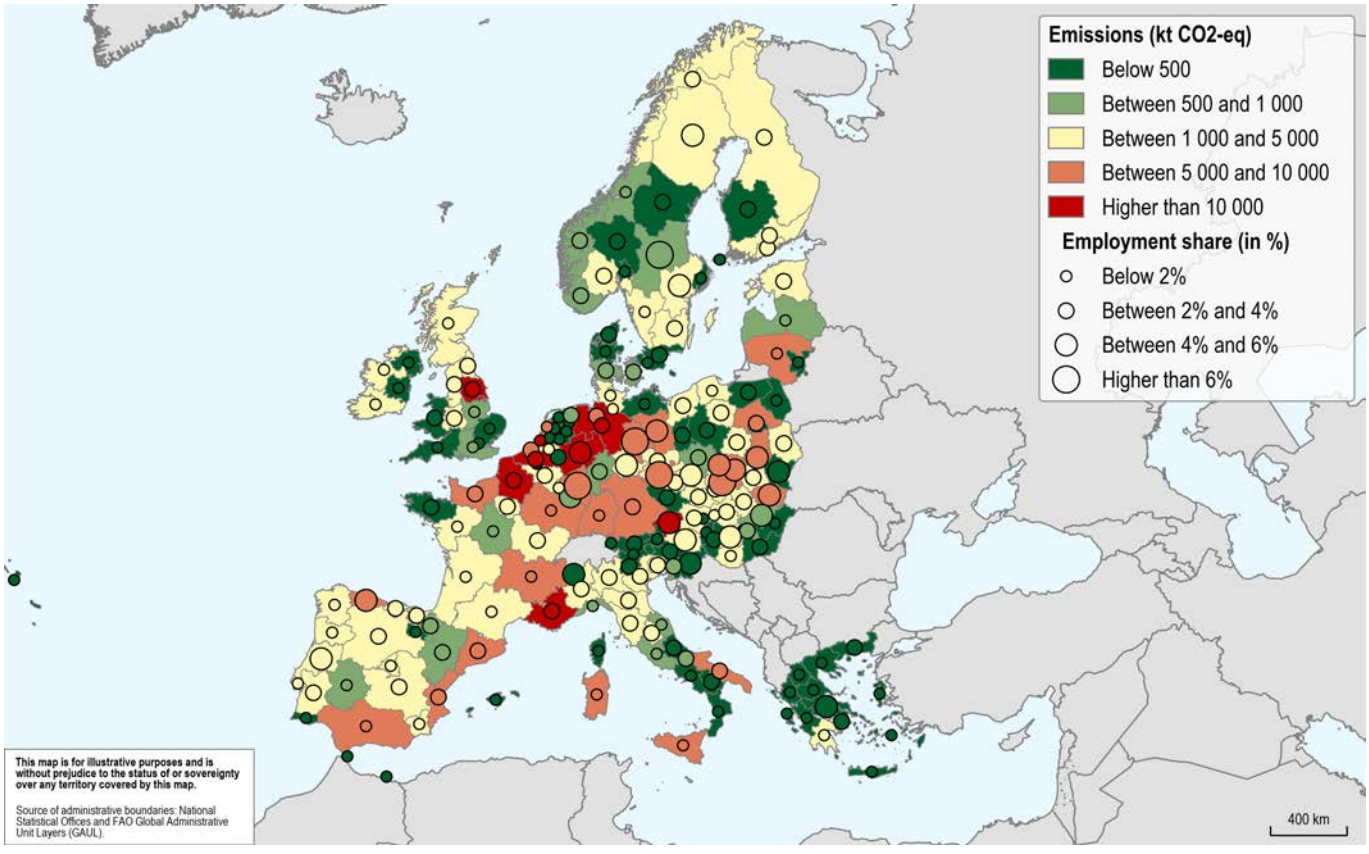
Manufacturing energy consumption per unit of GVA, 2018, European large regions (TL2)



StatLink https://stat.link/j5n61e

2.16. Manufacturing emissions are concentrated in a few regions

Emissions (kt CO2 eq) and employment share (%) in the top four high-emission manufacturing sectors, OECD European large regions (TL2), 2019



StatLink https://stat.link/d7epr5