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on the 9th Cohesion Report

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and reskilling of workers, investments in small and medium-sized enterprises, creation of new firms, research and innovation, environmental rehabilita- tion, clean energy, job-search assistance and trans- formation of existing carbon-intensive installations.

It is equally essential to prioritise social equity and provide support for workers affected and their households. Investing in retraining programmes through JTF support can help people acquire the skills to take up green economy jobs, while finan- cial support can reduce the burden on low-income households and create a more equitable transition path.

1.1 Progress toward a just transition in fossil and energy- intensive industries

This section presents regional statistics on current employment in carbon-dependent or carbon-inten- sive sectors in the EU and identifies the areas and activities where the green transition is creating new jobs. It also assesses the territorial impact of extending the ETS to fuels for residential heating and transport. Coal and carbon-intensive regions in the EU that are identified as most severely af- fected by transition process, receive support from the JTF to support the diversification of their econ- omies in the affected sectors.

Almost 340 000 people were directly and indirectly employed in the coal industry in the EU in 2018. The jobs concerned are highly concentrated, with 60 % in just seven regions (Śląskie and Łódzkie in Poland, Sud-Vest Oltenia in Romania, Yugoiztochen in Bul- garia, Severozápad in Czechia, Köln and Branden- burg in Germany, and Dytiki Makedonia in Greece) (Map 4.17). It is estimated that between 54 000 and 112 000 direct jobs could be lost by 2030[47].

The peat and oil shale industries are smaller. The former is estimated to employ, directly and indirectly, just under 12 000 and the latter almost 7 000, all in Estonia, the only country in the EU with such an industry. Closing down these indus- tries could have a significant impact on local and regional employment and will require economic restructuring.

More people work in carbon-intensive industries. In 2020, nearly 6 million people were employed in the car, steel, minerals, paper, chemicals, coke and petroleum sectors, 3 % of total employment in the EU. The main employment clusters in these sectors are in central Europe (Map 4.18).

The coal industry and carbon-intensive manufactur- ing face transformational challenges given the EU commitment to becoming climate-neutral by 2050. This means phasing out coal and shifting to low-car- bon technologies, such as those based on hydrogen, and using carbon capture and storage where decar- bonisation is not yet possible. It also means helping to mitigate the socio-economic and environmental impact of the transition on regions and the people living there. Case studies of fossil fuel phase-out (coalmining in the UK, oil refining in Croatia, and peat extraction in Finland) have shown that car- bon-dependent industries are often deeply rooted in local culture and identity[48]. The industries are con- centrated in a few places and job losses have been shown to have long- term adverse physical, mental and social effects on the people and communities concerned. Attempting to retrain the workers losing their jobs is insufficient. There needs to be long- term cohesive educational, financial and social sup- port to ensure a just transition. The support involved needs to be early and targeted, with collaboration with existing local support networks and alignment of interests among key stakeholders. The case stud- ies highlight the importance of place-based meas- ures, centred on partnership.

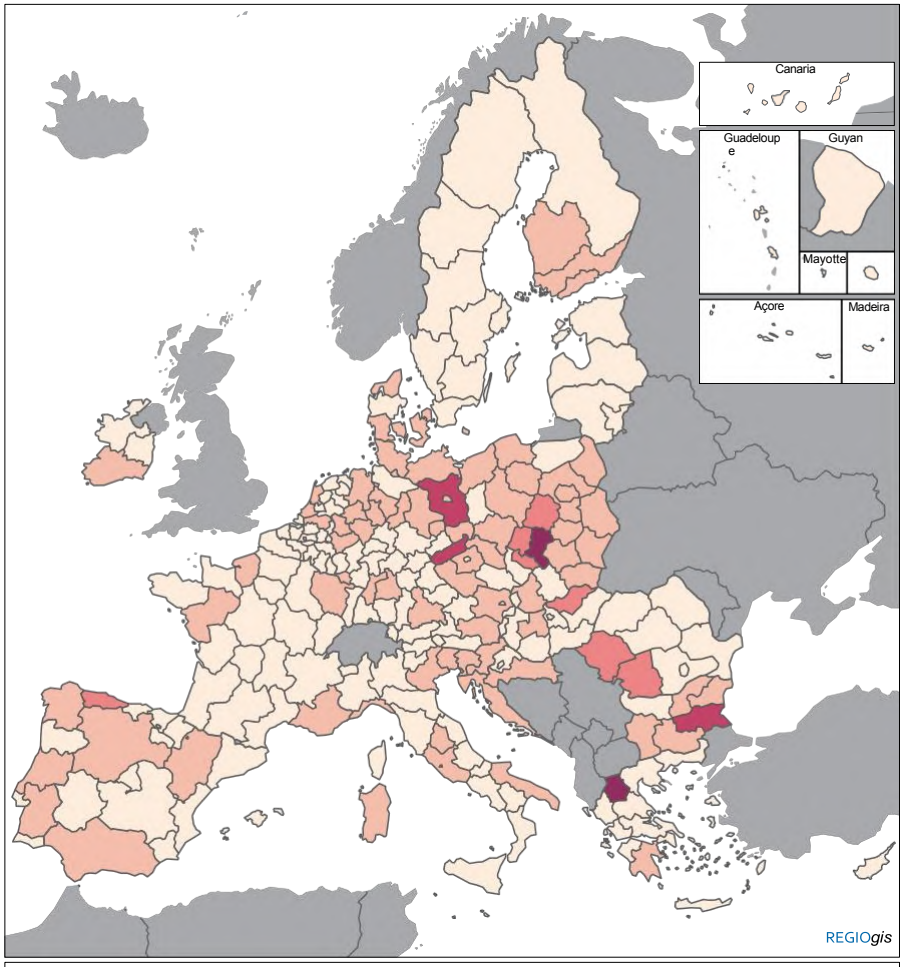
1.2 Competitiveness and sustainability of sectors in the climate and energy transition

The transition to a competitive green economy is underway, but the pace varies between regions. The regional competitive environmental sustaina- bility indicator[49] has been developed to show the share of employment in 56 NACE (nomenclature

32 Alves Dias et al. (2021).

33 Kaizuka (2022).

34 Marques Santos et al. (2023) and update for 2019 and 2020 in Marques Santos et al. (2024).

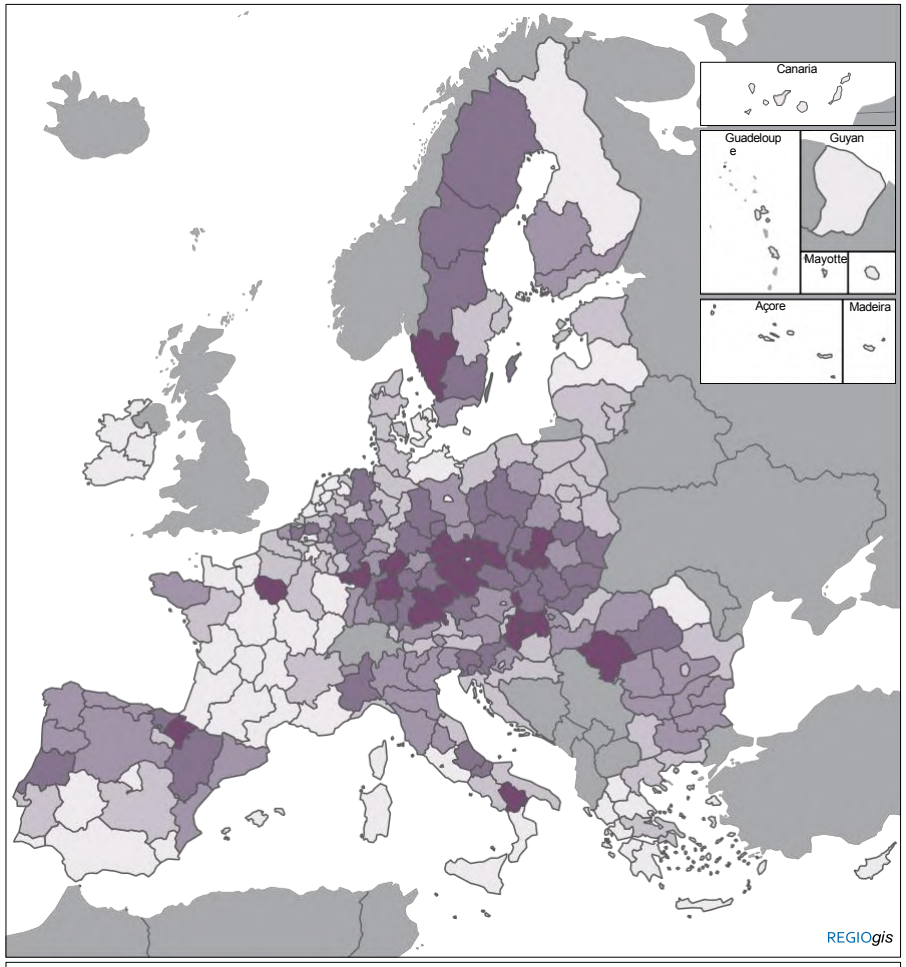


Map 4.17 Employment in the coal industry in NUTS 2 regions, 2018

% of total employment
- none
- <= 0.8
- 0.8 – 2.3
- 2.3 – 4.8
- > 4.8

Direct and indirect jobs in coalmining and coal-fired power
Source:

0 500 km



Map 4.18 Employment in carbon-intensive manufacturing in NUTS 2 regions, 2020

% of total employment
- <= 1.2
- 1.2 – 2.4
- 2.4 – 3.9
- 3.9 – 6.1
- > 6.1

Direct employment in paper and pulp (NACE17), coke and petroleum products (NACE19), chemicals (NACE20), non-metallic minerals (NACE23), basic metals (NACE24), and motor vehicles (NACE29).
Source: Eurostat.

0 500 km

of economic activities) sectors that are systemat- ically more competitive and sustainable than the EU median (Map 4.19). Sectoral competitiveness is measured by labour productivity and sustaina- bility by GHG emissions per worker. The indicator has been calculated for the years 2008–2020 and shows the shift in employment towards greener and more productive sectors over this period.

In 2019, the average region had 17 % of employ- ment in sectors that were both more competitive and more sustainable than the EU median. The share was largest in southern Germany, northern Austria, southern Ireland, and southern Scandi- navia, as well as in capital city regions. Between 2008 and 2020, the share increased by signifi- cantly more in more developed regions than in less developed or transition ones (Figure 4.15), widen- ing the difference between them.

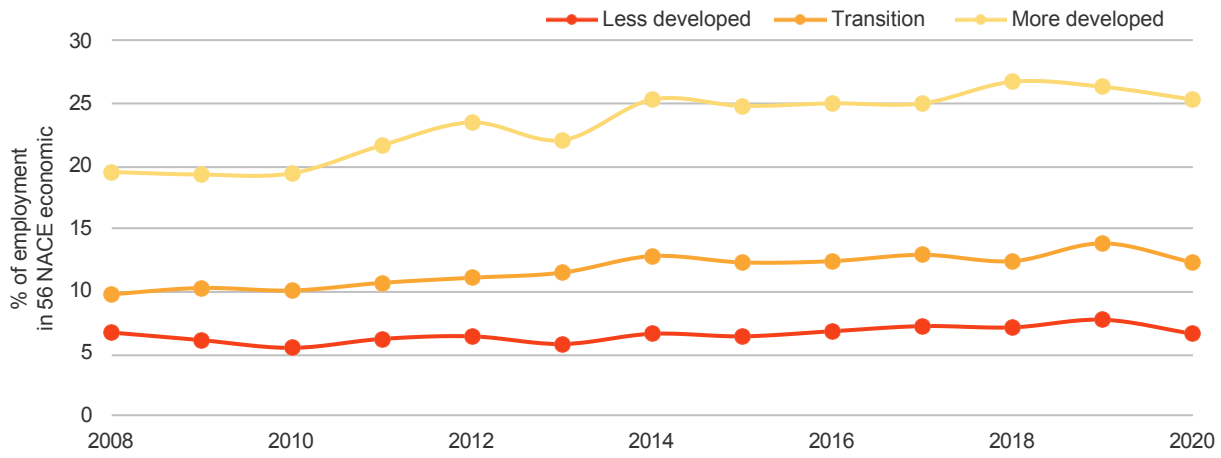
Econometric analysis suggests that the transi- tion to more competitive and sustainable regional economies is positively associated with investment co-funded by the ERDF, CF and European Social Fund[50]. This is particularly true in respect of com- petitiveness and the restructuring towards higher value-added sectors, which is especially evident in less developed regions that receive most funding.

Improvements in sustainability, however, are much less evident, suggesting that this is more difficult to achieve and that the transition to a low-carbon economy requires more time and effort. Factors such as R&D, the quality of government, and the qualifications of the workforce seem to be impor- tant in this regard. Adequate policy-making, reforms and investment are essential to implement the tran- sition to a low-carbon economy and adjust to new circumstances in a way that spurs employment, competitiveness and economic growth, with a focus on leveraging circular economy principles and de- ploying clean technology solutions to drive innova- tion and efficiency across industries.

1.3 Longer-term impact of the extension of the ETS and the transformation of industrial and service sectors

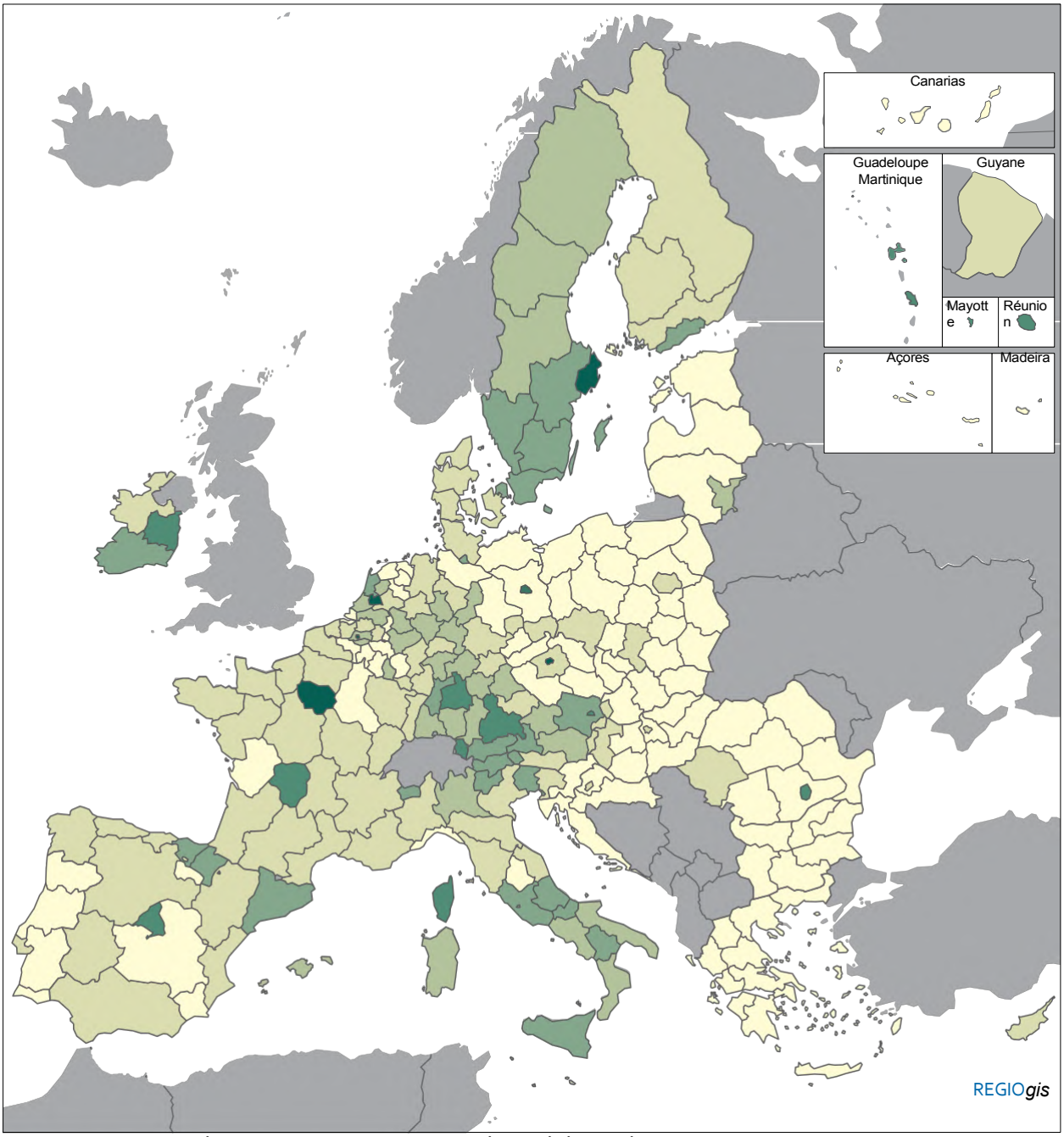
The ETS is designed to limit emissions of GHGs from power generation and large industrial plants through a cap-and-trade mechanism. In 2021, the ETS covered 40 % of GHGs emitted in the EU. In 2023, the EU approved a new ETS for fuel com- bustion in buildings, road transport and a few oth- er sectors. The emissions concerned account for another 40 % of EU emissions and so are equally

Figure 4.15 Trends in the regional competitive environmental sustainability indicator by category of region for Cohesion Policy, 2008–2020



Note: Share of employment in 56 NACE sectors that are systematically more competitive and more sustainable than the EU median (%). Source: JRC.

35 For more details see Marques Santos et al. (2023).



Map 4.19 Regional competitive environmental suitability indicator, 2019

% of total employment

- <= 10
- 10 – 20
- 20 – 30
- 30 – 40
- 40 – 50
- 50 – 60
- > 60

Share of employment of 56 NACE sectors that are systematically more competitive and more sustainable than the EU median.
Source: JRC.

0 500 km

important for achieving climate objectives. The share of emissions covered varies between coun- tries and regions. The share is largest in Luxem- bourg (Figure 4.16), mainly because of interna- tional through traffic.

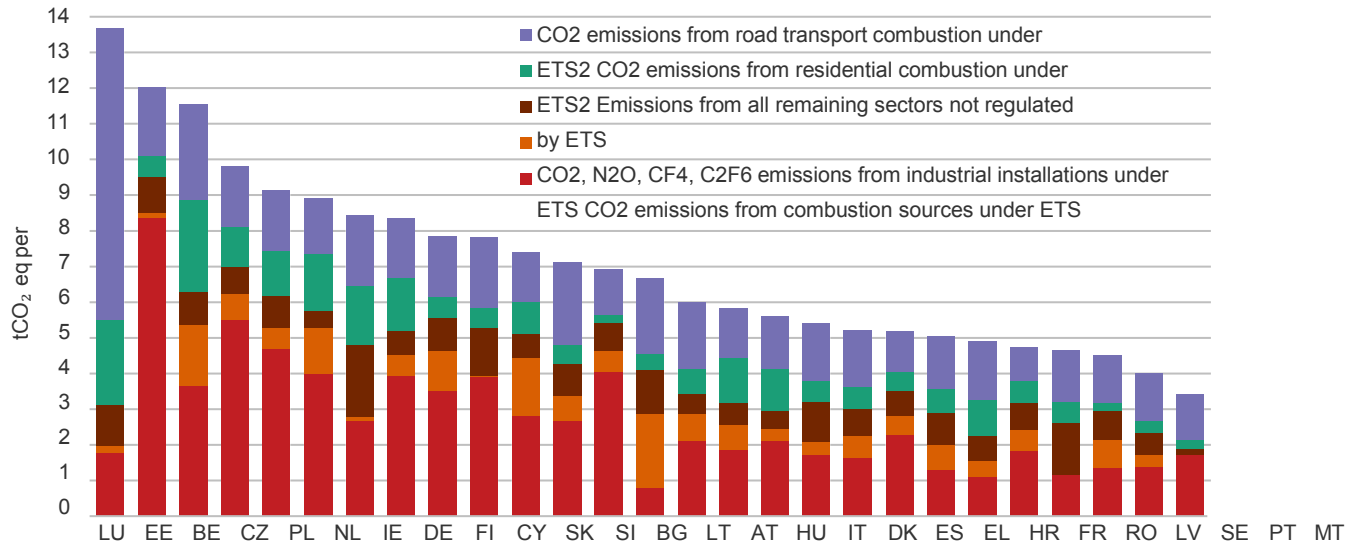
While GHG emissions from household energy con- sumption declined by 30 % between 1990 and 2021, those from road transport, which remains highly dependent on oil and petrol, increased by 18 %.

Higher prices for carbon fuels give an incentive for innovation and help to reduce emissions, but they tend to hit poorer households harder. The ex- tension of the ETS means that climate action will become more tangible for people, as they will be directly affected in heating their homes and using their cars as taxes are imposed or increased from 2027 under the system. Across the EU, households spend an average of between 3 % and 10 % of their income on heating and fuel (Figure 4.17). Although household expenditure on heating fu- els in the EU increases with household disposable income[51] – for the 20 % of households with the highest income (i.e. in the top quintile of the in- come distribution), expenditure is around twice as high as for the 20 % with the lowest levels – it in- creases less than in proportion. It, therefore, repre- sents a larger share of overall expenditure for the households in the bottom quintile than for those in the top. Fuel price increases, therefore, affect poorer households more because more of their budget goes on heating, posing increased risks of energy poverty. Households living in densely pop- ulated areas systematically spend less on heating than those in intermediate or sparsely populated areas, irrespective of income levels.

Total expenditure on fuel for transport is highest for all income groups in rural areas, and lowest in urban areas. The share decreases as income increases. As expected, the share of expenditure for transport fuels is larger in rural areas than others because of the greater use of private cars and motorcycles and a lower availability of public transport.

Extending the ETS to include fuel for heating and transport will therefore have a particularly large impact on low-income households in rural areas. The sharp increase in energy prices in 2022 seems to have led households to seek alternatives for heating their homes–firewood and heat pumps in particular.

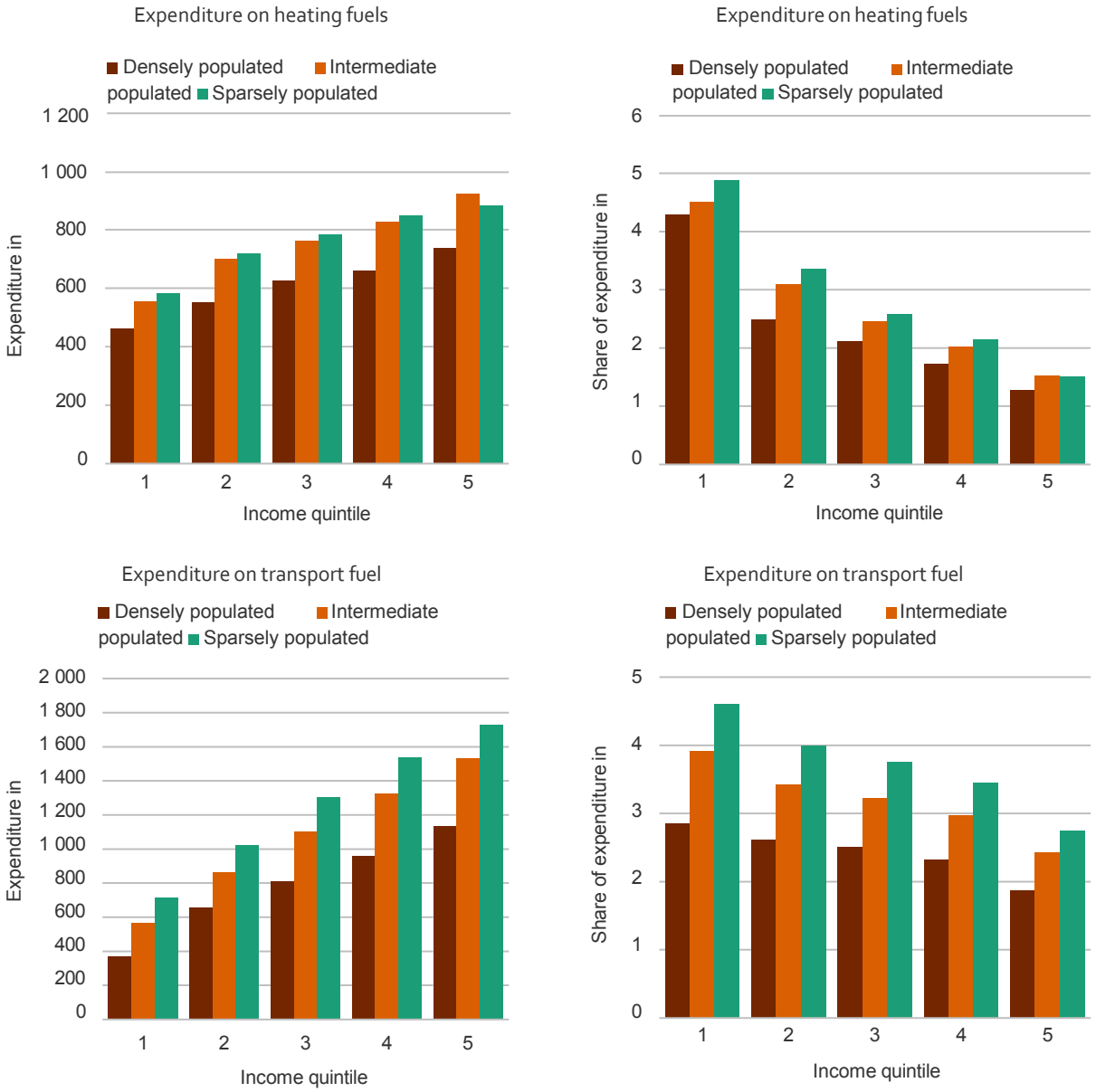
Figure 4.16 Emissions under the ETS and ETS2



Source: EDGAR (JRC).

36 Koukoufikis and Uihlein (2022); Ozdemir and Koukoufikis (2024).

Figure 4.17 Average expenditure and share of household income going on fuel for heating and transport by income quintile, EU, 2020



Note: Data for CZ, IE, IT, PL, PT, RO, FI and SE are not yet available for 2020; for CZ in 2015, population weights were adjusted with European Union statistics on income and living conditions (EU-SILC) weighted total number of households.
Source: JRC based on Eurostat.

The price of firewood and pellets[52], therefore, was 54 % higher in the EU in November 2022, when it peaked, than the year before, and in Austria, Den- mark, the three Baltic States, and Slovenia, twice as high, while sales of heat pumps in the EU increased by 39 % in 2022[53].

37 According to the Eurostat harmonised index of consumer prices (other solid fuels comprise coke, briquettes, pellets, firewood, charcoal and peat).

38 European Heat Pump Association (2023).

2. Key messages

The green transition has the potential to reduce regional inequalities, but it could equally lead to them widening. On the one hand, it is expected to create new jobs, provided it is supported by appro- priate policies, especially in rural, less developed regions that have high potential for the devel- opment of wind and solar power and for carbon capture and storage in natural ecosystems. On the other hand, there is evidence that the green tran- sition favours more developed regions, attracting investment and skilled workers there, while pos- ing challenges for employment and households in low-income rural areas, in particular, and poten- tially exacerbating social inequalities.

Addressing these challenges requires deepening the territorial approach to implementing the green transition in an equitable way. This can be done by supporting vulnerable regions through co-financing investment in renewable energy, energy-efficiency, clean and circular technologies, carbon-free vehicles and the corresponding infrastructure, and retraining and education, taking into account the 'do no signif- icant harm' principle to balance trade-offs. This is particularly important in less developed regions, which tend to be less prepared for the transition to a climate-neutral economy and to have more diffi- culty in reaping the potential benefits. It is equally important to prioritise social equity and provide sup- port for the workers affected, through retraining so that they have the skills to take up green jobs, and to help mitigate the burden on low-income households. As the green transition unfolds, minimising the im- pact on energy costs is vital to prevent heightened risks of energy poverty. Also, rural-proofing can help make policies on climate adaptation, energy, trans- port or employment fit for purpose.

Climate risk management and adaptation to climate change is becoming increasingly important to miti- gate the escalating costs of extreme weather events, floods, forest fires and water shortages. Better pre- paredness and increased climate resilience, such as by protecting and restoring ecosystems, depend on pro-active territorial policies to help vulnerable re- gions reduce the economic costs

of disaster mitiga- tion, infrastructure repairs and the consequences for healthcare, and so ensure their financial stability.

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