



FACTS BEHIND THE DEBATE

Recent trends in EU coal, peat and oil shale regions

HEADLINES

- Europe is undergoing a transformation of its energy system. Traditional energy sectors relying on the production and use of fossil fuels will shrink, with concomitant negative impacts on employment in these sectors.
- Coal activities are identified in 19 EU countries and 94 NUTS 2 regions, supporting nearly 208 000 direct jobs.
- Between 2020 and 2030, the total number of jobs at risk in the coal sector under various coal phase-out scenarios is likely to range from 54 000 to 112 000.
- Coal-related jobs at risk by 2030 are concentrated in Poland, Germany, Romania, Bulgaria and Greece.
- Peat is used for energy in six countries (Estonia, Finland, Ireland, Latvia, Lithuania and Sweden), while oil shale is currently used only in Estonia. Peat is associated with 6 300 jobs and oil shale with nearly 5 200 jobs.
- While the transition from coal may bring notable challenges for the regions concerned, changes in peat and oil shale are not expected to have such a profound impact.
- The deployment of renewable energy technologies in coal regions can create up to 315 000 jobs by 2030, and up to 460 000 jobs by 2050 in previously identified coal regions.*

*[Clean energy technologies in coal regions: Opportunities for jobs and growth](#)

INTRODUCTION AND POLICY CONTEXT

In December 2019, the European Commission announced the European Green Deal, building on work carried out under the 'Clean Energy for All Europeans' package. This is an integral part of this Commission's strategy to support the EU objective of reaching climate neutrality by 2050. Under the Green Deal, the Just Transition Mechanism (JTM) is a key tool to ensure that the transition towards a climate-neutral economy happens in a fair way, leaving no one behind.

In September 2020, the Commission presented its plan to reduce EU greenhouse gas emissions by at least 55 % by 2030, compared to 1990 levels. This level of ambition for the next decade will put the EU on a pathway to climate neutrality by 2050. It will require a fundamental rebalancing of our energy system, moving towards coal phase-outs and more sustainable economic frameworks. This will potentially pose significant challenges for many European regions that rely on fossil fuels like coal, peat and oil shale for energy, especially when it comes to associated jobs.

The JRC has been involved in work relating to the regional transition since 2017 and has provided numerous outputs used for steering discussions and supporting policymakers. "[EU coal regions in transition: opportunities and challenges ahead](#)", published in 2018, highlighted the challenges the coal regions may face in their transition beyond coal. "[Recent trends in EU coal, peat and oil shale regions](#)" updates this work, extending it to peat and oil shale.

CURRENT SITUATION

Coal

In 2018, the most recent year for which data are available, 90 coal mines were operating in 11 EU countries: Bulgaria, Czechia, Germany, Greece, Hungary, Italy, Poland, Romania, Slovakia, Slovenia and Spain. Altogether, they produced 442 million tonnes of hard coal and lignite.

The share of electricity from coal-fired power plants in the EU-27 power generation mix started to decrease in 2016, reaching 20 % in 2018. In 2020, there were 166 coal-fired power plants operating in 18 EU countries, with a total capacity of 112 GW.

We estimate that activities in coal mining and coal-fired power plants offered direct employment to 208 000 people across Europe in 2018 (Figure 1); 76 % of these jobs are in the mining sector. The regions with the highest number of jobs in the coal sector (mines and power plants) are in Poland, Germany, Czechia, Romania and Bulgaria.

From 2013 to 2018 we estimate a decrease of almost 37 % in the number of jobs indirectly related to the coal sector in the EU, assuming the regional economic structure did not change in that time frame.

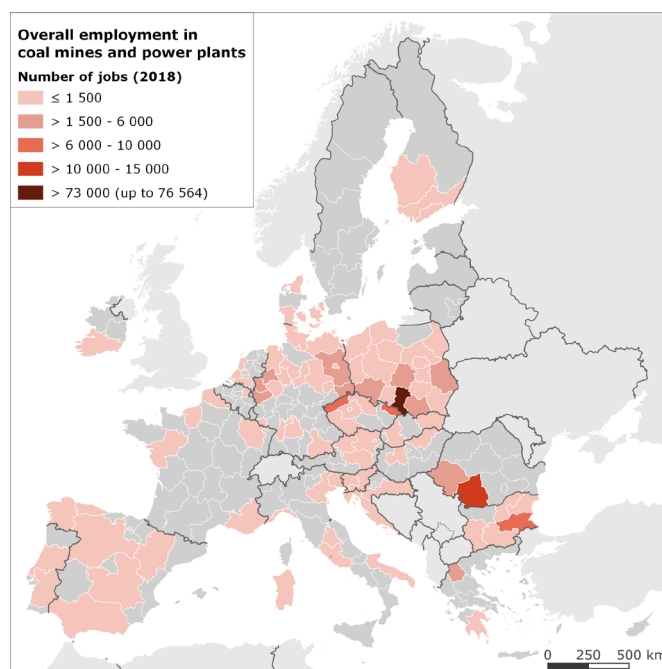


Figure 1: Overall number of jobs in coal-fired power plants and coal mines in EU coal regions.

Changes in the coal sector

Between 2015 and 2018 in the EU, 37 mines closed out of 127, in Bulgaria, Czechia, Germany, Poland, Romania, Slovakia and Spain. Lignite production decreased by 8 % in this period and hard coal sales declined by 20 %. Over the last four years (2020 included), more than 26 GW of coal-fired capacity was retired in the EU, mainly in Germany (9.3 GW), Spain (5.3 GW), Poland (3.2 GW), Czechia (1.3 GW) and Italy (1.3 GW).

According to Euracoal,¹ between 2010 and 2018, direct jobs in EU coal mining decreased from 239 400 to nearly 160 000, a decline of 32 %. The countries that lost the highest shares of these jobs were Germany and Czechia (32 % and 27 %, respectively).

Peat and oil shale

In 2018, six EU countries (Estonia, Finland, Ireland, Latvia, Lithuania and Sweden) produced nearly 9.4 million tonnes of peat for energy use. Finland uses the highest share of peat for heating purposes (25 % of national gross heat production).

There are 208 peat-fired energy plants² in these six countries, primarily for heat production.

JRC experts estimate that peat activities related to energy use employ nearly 6 300 people in these countries (Figure 2), or 63 % of the people employed in peat extraction activities for all uses (including, for example, peat for horticulture).

Estonia produced nearly 16 million tonnes a year of oil shale (Figure 3). Oil shale activities directly employed nearly 5 200 people in 2018, almost 0.4 % of the Estonian working population.

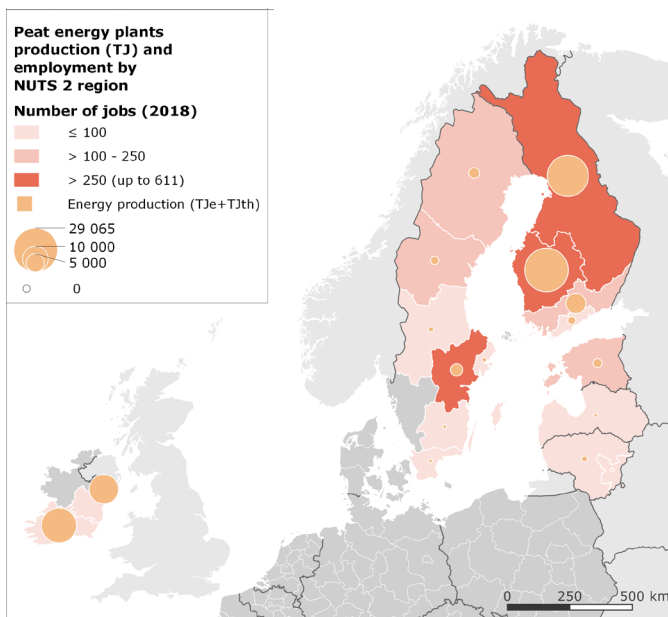
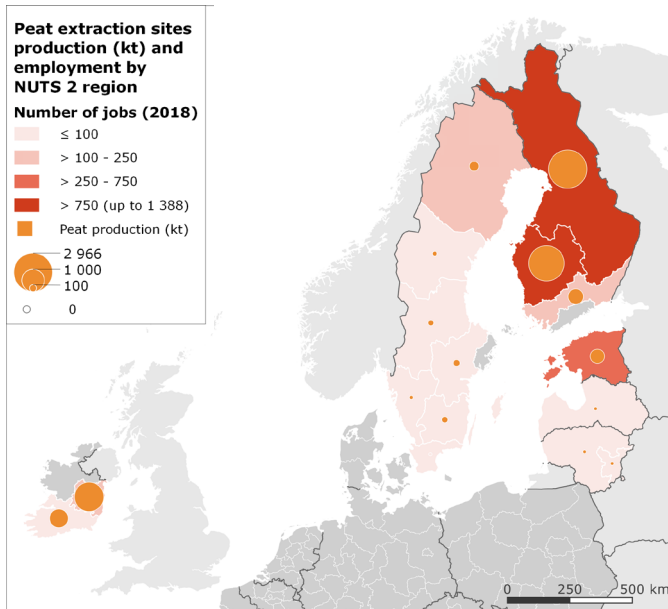


Figure 2 (top): Regional distribution of fuel peat end use and related employment, Figure 2 (bottom): Estimated employment related to the energy use of peat by region.

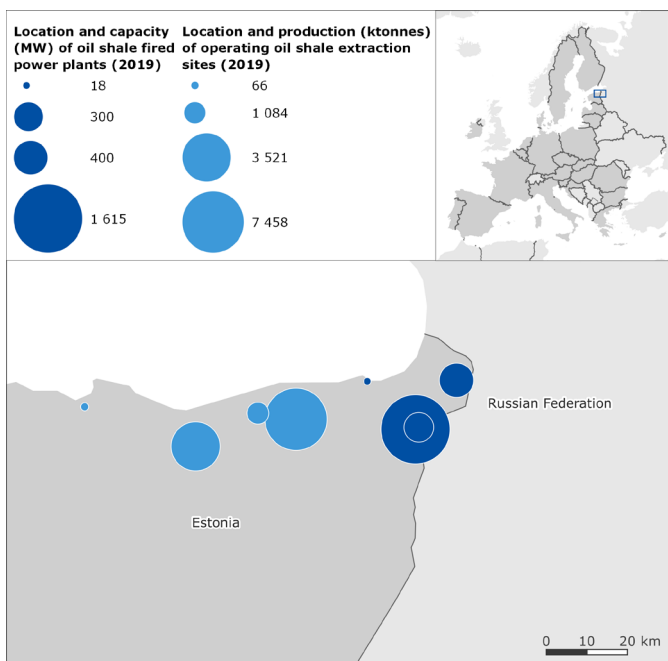


Figure 3: Location³ of oil shale-fired power plants and oil shale extraction sites, and their capacity and production.

Carbon-intensive industries

Carbon-intensive industries used coal in 85 % of the regions with operating coal mines in 2018-19. The biggest coal user by far is the iron and steel industry, accounting for 85 % of the total coal used in these sectors.

Industries such as steel, cement, chemicals and paper also use coal as feedstock and fuel, and together account for 96 % of coal use in industry. Germany is the largest user of coal in the iron and steel industry and in the non-metallic minerals sector, while Poland is responsible for nearly half (46 %) of all coal consumption in the chemicals and petrochemicals sector. Use of coal in the pulp and paper industry is mainly restricted to Germany, Poland and Austria.

The Finnish pulp and paper sectors use peat and the Estonian cement and lime sectors use oil shale.

FUTURE PERSPECTIVES

Energy scenarios show rapid changes in coal production and use: from a seven-fold reduction in the scenarios where coal still plays a role in the 27 EU countries, to an almost complete phase-out in the scenarios that are dominated by renewables, electrification and alternative fuels. Long-term energy scenarios do not report peat or oil shale separately.

Over the period 2021-2030, the number of jobs at risk of being lost could rise to around 31 000, due to the application of national coal phase-out policies in electricity generation, or to coal phase-out scenarios. Over the same period, additional employment losses resulting from the planned closure of mines may rise to a total of 2 400 in Czechia and Germany.

Between 2020 and 2030, total job losses in coal-fired power plants and mines under various coal phase-out scenarios are likely to range from 54 000 to 112 000 (Figure 4). The countries likely to see the most coal-related job losses are Poland, Germany, Romania, Bulgaria and Greece.

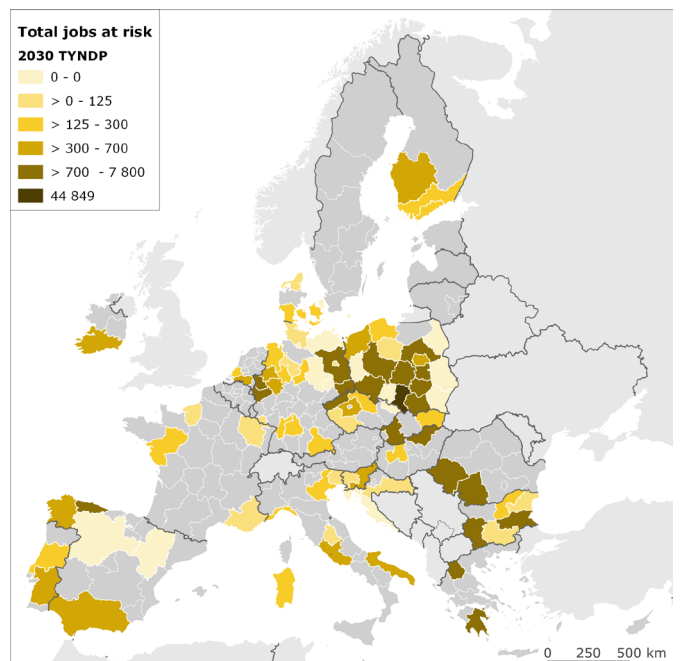


Figure 4(a): Potential job losses in 2020-2030 in the coal sector (coal mines and power plants), based on the TYNDP⁴ coal phase-out scenario.

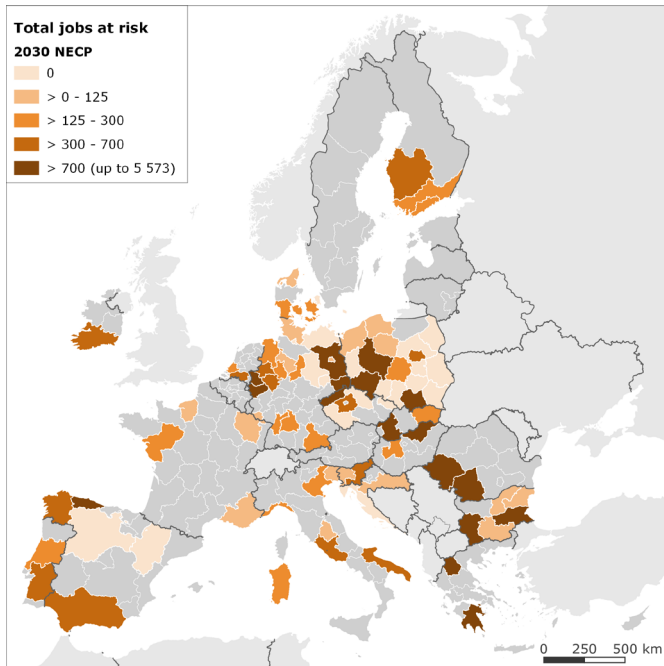


Figure 4(b): Potential job losses in 2020-2030 in the coal sector (including coal mines and power plants), based on the NECP⁵ coal phase-out scenario.

The number of jobs at risk indicates that the transition from coal may bring notable challenges for the regions concerned. Our previous work found promising potential in EU coal regions for job creation in the renewable energy sector. According to our estimations, and based on regions identified in 2018, we found that up to 315 000 jobs can be created by 2030 by deploying clean energy production technologies in coal regions as projected in EUCO3232.5, a European Commission decarbonisation scenario. The estimation reaches 460 000 new jobs in a 2050 horizon. Figures are even greater when taking into account the job creation potential of energy efficiency, with an additional 200 000 new jobs per year to be created by 2050, according to an in-house scenario. For an analysis of the deployment of renewable and other low-carbon energy technologies as alternatives for jobs at risk in affected regions, see our 2020 report on [Clean Energy Technologies in Coal Regions](#).

- 1 <https://euracoal.eu/info/euracoal-eu-statistics/>
- 2 In Finland, there are also 139 smaller boiler units.
- 3 Locations are approximate and may refer to companies.
- 4 ENTSO-E publishes a 10-year network development plan (TYNDP) every two years on how to develop the power grid over the next 10 to 20 years, so that it can contribute effectively to achieving these different and sometimes competing goals.
- 5 Each EU Member State has prepared a National Energy and Climate Plan (NECP) to meet the EU's energy and climate targets for 2030.

Contacts: Zoi.Kapetaki@ec.europa.eu; Jose.Moya@ec.europa.eu

Find out more: <https://publications.jrc.ec.europa.eu/repository/handle/JRC123508>

The European Commission's science and knowledge service
Joint Research Centre