The coal industry across Europe and the outlook for coal

*European Coal in Transition: rising like a phoenix*

RFCS High-level Workshop
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Senior Vice President
EURACOAL: 23 members and an observer from 14 countries

- DEBRIV – Deutsche Braunkohlen-Industrie-Verein (DEU)
- ZSDNP – Czech Confederation of Coal and Oil Producers (CZE)
- PPC – Public Power Corporation (GRC)
- PGG – Polska Grupa Górnicza S.A. (POL)
- PPWB – Confederation of Polish Lignite Producers (POL)
- GIPH – Górnicza Izba Przemysłowo-Handlowa (POL)
- PATROMIN – Asociația Patronală Minieră din Romania (ROU)
- BAZ – Borsod-Abáuj-Zemplén County Government (HUN)
- MMI – Mini Maritza Istok (BGR)
- GIG – Central Mining Research Institute (POL)
- CPERI/CERTH – Chemical Process and Energy Resources Institute (GRC)
- BSN – Branchenverband Steinkohle und Nachbergbau (DEU)
- DTEK (UKR)
- Donetsksteel (UKR)
- Lubelski Węgiel „Bogdanka” S.A. (POL)
- Premogovnik Velenje, d.o.o. (SVN)
- HBP – Hornonitrianske bane Prievidza, a.s. (SVK)
- EPS – Electric Power Industry of Serbia (SRB)
- TKI – Turkish Coal Enterprises (TUR) – observer
- RMU “Banovići” d.d. (BIH)
- IMG-PAN Strata Mechanics Research Institute (POL)
- SYSTRA SUBTERRA Ingeniería S.L. (ESP)
- DMT GmbH & Co. KG (DEU)
Coal in Europe 2023

lignite production, hard coal production and coal imports

EU-27 million tonnes c.f. 2022

- lignite 223.8 - 24%
- hard coal 49.7 - 9%
- imports 94.2 - 26%

Coal mining is now concentrated in Central, Eastern and Southeastern Europe but every European country imports coal in one form or another.

Source: EURACOAL members - * 2022 data
Note: bars show million tonnes of coal equivalent (Mtce) while figures at top of bars show millions of physical tonnes (Mt)
Production of coal and lignite, 2022

The chart shows the production of coal and lignite in million tonnes for various countries in 2022. The countries are listed from left to right as Germany, Poland, Bulgaria, Czechia, Romania, Greece, Hungary, Slovenia, Slovakia, and Norway. The bars indicate the production with brown coal and hard coal represented in different colors. Germany has the highest production, followed by Poland, Bulgaria, Czechia, Romania, Greece, Hungary, Slovenia, Slovakia, and Norway with the least. The production is measured in million tonnes.

Sources: Eurostat, EURACOAL
Coal and lignite in EU electricity generation, 2022

Source: Eurostat database (n.b. coal includes peat* and oil shale**)

- Global average: 35%
- EU average: 17%

**Table:**

<table>
<thead>
<tr>
<th>Country</th>
<th>Coal Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>70%</td>
</tr>
<tr>
<td>Estonia</td>
<td>66%</td>
</tr>
<tr>
<td>Czechia</td>
<td>44%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>43%</td>
</tr>
<tr>
<td>Germany</td>
<td>33%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>23%</td>
</tr>
<tr>
<td>Romania</td>
<td>19%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>14%</td>
</tr>
<tr>
<td>Croatia</td>
<td>13%</td>
</tr>
<tr>
<td>Greece</td>
<td>11%</td>
</tr>
<tr>
<td>Finland</td>
<td>11%</td>
</tr>
<tr>
<td>Hungary</td>
<td>9%</td>
</tr>
<tr>
<td>Italy</td>
<td>9%</td>
</tr>
<tr>
<td>Ireland</td>
<td>8%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>8%</td>
</tr>
<tr>
<td>Spain</td>
<td>3%</td>
</tr>
<tr>
<td>Austria</td>
<td>3%</td>
</tr>
<tr>
<td>Belgium</td>
<td>2%</td>
</tr>
<tr>
<td>France</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Notes:**
- *: peat
- **: oil shale

Last update: 19.12.2023

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Coal demand forecasts to 2030 and 2050 under EU policy

Fit-for-55 (European Green Deal) and REPowerEU (security)

Sources: European Commission, SWD(2022) 230, Figure 1; Eurostat nrg_bal_s database, last updated 19.12.2023; and Eurostat nrg_cb_sffm database last updated 21.12.2023 (2023 estimate)

Sources: EU Reference Scenario 2020 – trends to 2050, European Commission, 2021; Policy scenarios for delivering the European Green Deal, European Commission, 2021; and World Energy Outlook, IEA, 2022
Fit-for-55 and REPowerEU – wind and solar PV forecast to grow

n.b. in 2022, the total installed capacity of all generation types in the EU was c.1000 GW

sources: European Commission SWD(2023) 58 and ENTSO-E
EU Emissions Trading System = most expensive carbon tax!

Carbon trading prices around the world, November 2023

- South Korea
- China
- Canada (provinces)
- New Zealand
- United Kingdom
- US (states)
- European Union

€/tCO₂e

Source: International Carbon Action Partnership Allowance Price Explorer
Electricity prices for median household consumers, 2023 H2

purchasing power standards (PPS) per 100 kWh

Map showing electricity prices in different countries across Europe.
European coal and lignite production 1800-2022 and forecast

- Great Depression
- WWI
- WWII
- oil shocks
- 1990 collapse of the Eastern Bloc
- SARS-CoV-2 pandemic

Note: includes production in the EU, Türkiye, Ukraine and Western Balkans

N.B. includes production in the EU, Türkiye, Ukraine and Western Balkans

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Coal, peat & oil shale phase-out plans in EU Member States

2020-2030
- Austria
- Sweden
- Portugal
- Slovakia
- Ireland
- France
- Hungary
- Italy
- Greece
- Spain
- Denmark
- The Netherlands
- Finland

2032-2049
- Romania
- Croatia
- Slovenia
- Czech Republic
- Estonia
- Bulgaria
- Germany
- Poland
China coal production 1900-2022 – and European production

The world’s uneven CO₂ footprint – estimated cumulative CO₂ emissions between 1970 and 2021 by country

Source: Statistica, November 2022 based on Emissions Database for Global Atmospheric Research (EDGAR), European Commission
Commodities:
- iron and steel
- cement
- aluminium
- fertilisers
- electricity
- hydrogen

Reporting requirements since October 2023: importers must declare embedded emissions

Phase in of tax: 2.5% of weekly average EU ETS auction prices from 2026 rising to 100% by 2034

EU strategy: to create a global system of linked carbon trading schemes
Restrictions on methane flaring:
- >99% combustion efficiency from 1 January 2025 (except in emergencies)

Restrictions on methane venting at non-coking coal mines:
- 5 tCH$_4$/kt from 1 January 2027
- 3 tCH$_4$/kt from 1 January 2031
- Worker safety shall not be compromised

Restrictions on methane venting at coking coal mines:
- European Commission to publish a delegated act by 2027

Incentives to reduce methane emissions:
- Fees, charges or penalties by member states

Methane use obligation from 2030 for closed mines (unless unfeasible)

Requirements on importers from 1 January 2027:
- Monitoring, reporting and verification equivalent to EU rules
For **underground mines**:
- continuous (90%), source-level, direct measurement and quantification of ventilation exhaust shafts (±5% or ±500 tCH₄/year)
- source-level direct measurement and quantification of all methane captured, used and flared at drainage stations

For **surface mines**:
- deposit-specific methane emission factors to be established quarterly, based on state-of-the-art-industry practices and best available technologies
- European Commission to publish an EU standard by delegated act

For **closed mines** (where operations ceased within last 70 years):
- monitoring and reporting unless emissions below a *de-minimis* 0.5 tCH₄/year
- except for mines flooded for >10 years and with no material emissions

Independent verification before submission to Competent Authorities
Average GHG intensity of US LNG, pipeline gas & coal in EU

Source: Comparative GHG Footprint Analysis for European and Asian Supplies of US LNG, Pipeline Gas, and Coal. Berkeley Research Group, LLC (BRG) Energy & Climate, April 2024
Coal and lignite are in decline and have been in decline since 1990. End dates are set, and the end may come sooner in some countries. Outlook depends on future EU priorities:
- commitment to climate protection goals (net-zero emissions by 2050)
- energy costs for economic and industrial competitiveness
- energy diversification for security of supply
- environmental standards to achieve European Green Deal goals
Secure and flexible coal (or gas) power complements intermittent RES
EU coal industry continues to restructure with new activities, often energy related. New technologies are essential.

RFCS needs to support coal industry diversification in the coal regions
New technologies to electrify the net-zero EU economy

Source: Energy Technology Perspectives 2023, Figure 1.3, International Energy Agency, Paris, January 2023
Thank you!