A fair transition away from coal
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Outline

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Introduction: who we are

“A team of financial specialists making climate risk real in today’s financial markets”

Our research on unburnable carbon and stranded assets has started a new debate on how to align the financial system in the transition to a low carbon economy.
Coal power in the EU

• 155 GW of coal plant
• Around ¼ of total electricity generation
• “Paris-compliant” scenarios see no EU coal by 2030
• Already seen large disruption:
  • Between 2008-13 the five largest utilities lost over €100bn in value
A Paris compatible pathway

The IEA’s B2DS gross power generation in the EU28
## Main offenders - lignite plants in the EU

### TOP 10 EUROPEAN POLLUTERS

<table>
<thead>
<tr>
<th>RANK</th>
<th>PLANT</th>
<th>OWNER</th>
<th>2017 CO$_2$ EMISSIONS (Mt)</th>
<th>YEAR ON YEAR CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Belchatow</td>
<td>PGE</td>
<td>37.6</td>
<td>8%</td>
</tr>
<tr>
<td>2</td>
<td>Neurath</td>
<td>RWE</td>
<td>29.9</td>
<td>-5%</td>
</tr>
<tr>
<td>3</td>
<td>Niederaußem</td>
<td>RWE</td>
<td>27.2</td>
<td>9%</td>
</tr>
<tr>
<td>4</td>
<td>Jänschwalde</td>
<td>LEAG</td>
<td>23.6</td>
<td>-1%</td>
</tr>
<tr>
<td>5</td>
<td>Weisweiler</td>
<td>RWE</td>
<td>18.9</td>
<td>1%</td>
</tr>
<tr>
<td>6</td>
<td>Schwarze Pumpe</td>
<td>LEAG</td>
<td>11.4</td>
<td>-7%</td>
</tr>
<tr>
<td>7</td>
<td>Lippendorf</td>
<td>EPH</td>
<td>11.4</td>
<td>6%</td>
</tr>
<tr>
<td>8</td>
<td>Kozienice</td>
<td>ENEA</td>
<td>11.2</td>
<td>-7%</td>
</tr>
<tr>
<td>9</td>
<td>Boxberg</td>
<td>LEAG</td>
<td>10.6</td>
<td>9%</td>
</tr>
<tr>
<td>10</td>
<td>Maritsa East 2</td>
<td>TPP</td>
<td>10.5</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: [Sandbag Climate Campaign](https://sandbag.org/)
Bełchatów
Lignite of the Living Dead

Our assumptions:

• Fuel price by country and fuel
• Electricity tariff by country
• Both assumed flat out to 2030
• Carbon price rising to €20 by 2030
• Evaluated pollution control technologies at plant level
• Higher fixed costs for lignite
• Lower efficiency with age
• Ongoing capital additions and maintenance
Profitability of coal plants

Gross profitability of operating EU coal fleet in 2017

2017: ~50% of EU coal fleet is cash flow negative

Gross profitability (GW)

Cumulative coal capacity (MW)

Source: Lignite of the Living Dead, Carbon Tracker (2017)
Profitability of coal plants

Gross profitability of operating EU coal fleet

March 2018: ~66% of EU coal fleet is cash flow negative

Source: Lignite of the Living Dead, Carbon Tracker (2017)
Profitability of coal plants

Gross profitability of operating EU coal fleet

Liberalised power markets phase-out coal through economics

2030: ~100% of EU coal fleet is cash flow negative

Cumulative coal capacity (MW)

Source: Lignite of the Living Dead, Carbon Tracker (2017)
Findings: Stranded Value in the EU

-6,000 -5,000 -4,000 -3,000 -2,000 -1,000 0 1,000

Stranded value EU coal power owners

Since most coal generation in the EU is loss-making, utilities could save money by retiring coal power in accordance with the Paris Agreement.

Source: Lignite of the Living Dead, Carbon Tracker (2017)
Findings: Stranded Value in the EU

Below 2°C stranded value for the EU28 member states

Source: Lignite of the Living Dead, Carbon Tracker (2017)
New Czech firm to invest 1 billion euros in European power

Eon sells power plant

PRAGUE, Feb 22 (Reuters) - German utility Eon's holding company to invest more in renewable energy by fossil fuels, even as many utilities across Europe are increasingly looking to sell power plants and reduce their dependence on coal.

EON to Acquire RWE's Innogy, Transforming German Energy Industry

By Eyk Henning, Aaron Kirchfeld, Dinesh Nair, and Manuel Baigorri
11 March 2018, 09:16 CET Updated on 11 March 2018, 21:50 CET

→ RWE will emerge owning minority stake in enlarged EON
→ Deal sees RWE taking both Innogy and EON's renewable assets
Our theory of change for existing coal power

Coal power is economically obsolete

1. Inflection point 1.
2. Inflection point 2.
3. Inflection point 3.

New dispatchable renewables outcompete operating existing coal

New renewables outcompete operating existing coal

New renewables outcompete new coal

Source: Carbon Tracker illustration
Inflection point 1 – RE already outcompetes coal

EU LCOE of power generation technologies in 2017

Based on data from BNEF and IEA as well as Carbon Tracker assumptions. Source: Lignite of the Living Dead, Carbon Tracker (2017)
Inflection point 2 – New RE is going to outcompete operating coal

EU: LCOE of wind and solar versus operating cost of coal

- 2024: New wind cheaper than operating coal
- 2027: New solar PV cheaper than operating coal

Operating cost is based on a capacity weighted average. Learning rate of 20% for solar and 5% for wind. Capacity additions based on IEA B2DS.

Source: Lignite of the Living Dead, Carbon Tracker (2017)
National coal phaseouts

Announced:
- France: 2021
- Sweden: 2022
- UK: 2025
- Italy: 2025
- Austria: 2025
- Finland: 2030
- Denmark: 2030
- Portugal: 2030

Considering:
- Germany
- Ireland
- Slovakia

No coal:
Belgium (since 2016), Iceland, Norway, Albania, Switzerland, Latvia, Lithuanian, Estonia

Source: Beyond-Coal Campaign https://beyond-coal.eu/
Why do uneconomic plants keep running?

- Hedge against future gas price increases
- In hope of future capacity or retirement payments
- Try to outlast competitors
- Not allowed to close (e.g. Iberdrola in Spain)
- Sometimes large costs for closure & cleanup (particularly if there is a captive mine)
Health impacts: SO2
For more information please visit:

www.carbontracker.org
@carbonbubble

If you are interested in knowing more, please get in touch:
lwatson@carbontracker.org
IEF & BREF

70% of operating coal capacity is non-compliant with BREF

The impact of BREF on operating coal plants in the EU

Source: Carbon Tracker analysis
IED & BREF

EU Coal Plants

BREF compliance by utility

Source: Carbon Tracker analysis