• **The Good**: Availability and cost may shorten asset lives of hard coal; high gas & CO2 prices shorten payback periods for renewables, still more competitive versus fossil fuels.

• **The Bad**: High gas prices may extend asset lives of lignite; shift Government focus away from climate security.

• **The Ugly**: Commodity prices are driving Government plans to buy out minority shareholders as owners of coal capacity at PGE, largely at Uniper and potentially at CEZ.

• This report includes separate company reports on each of the CA100+ EU coal names, **CEZ**, **PGE**, **RWE** and **Uniper**.
About Carbon Tracker

The Carbon Tracker Initiative is a team of financial specialists making climate risk real in today’s capital markets. Our research to date 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.

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With thanks to the wider Carbon Tracker tea
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1. Key Findings – EU Coal

- The gas price is central to the current cost of living crisis; governments will prioritise security of supply & affordability. Sharp moves in commodity prices are driving Government plans to buy out minority shareholders as owners of coal capacity at PGE & potentially CEZ and largely at Uniper. RWE is an exception.

- Achieving security of supply implies extending asset lives of coal and increasing carbon emissions into 2023. High commodity prices are absorbing increasing amounts of company liquidity for margin collateral, discouraging hedging, reducing earnings visibility and potentially delaying capex.

- However, market forces are bringing constructive change. Availability and cost of hard coal are putting pressure on profitability & asset lives, especially at Uniper. All four companies are reviewing capex for new build gas projects. High gas prices imply faster payback times for renewables; higher CO2 prices make renewables still more competitive versus coal & gas.

- The German and possibly Czech Government will likely bring forward phaseout of lignite from 2033 to 2030 (CEZ has shortened accounting asset lives to 2030). This should follow the expiry of German emergency laws in March 2024.

- Investors need to ask companies three questions:
  
  - How much capex is needed to keep coal assets operating and (where applicable) what are plans to fully fund provisions for closure of lignite by 2030?
  - How are your gas project plans changing and how will you decarbonise capex, aligning with the goals of the Paris Agreement?
  - As a source of more sustainable earnings growth, supportive of equity valuations with a more competitive generation mix, what are your plans to accelerate renewables capex (especially PGE & CEZ)?
2. EU Coal Overview

2.1 Why Coal?

Retiring coal represents the fastest route to decarbonisation and alignment with the goals of the Paris Agreement. The four CA100+ companies profiled, RWE, PGE, Uniper & CEZ accounted for around 220mt of CO2 emissions in 2021, of which more than 160mt is from European coal. In view of Russian gas supply issues and current level of gas prices, European CO2 emissions from coal will almost certainly be higher in 2022 and probably also higher in 2023.

All four companies mine lignite and generate more electricity from lignite than hard coal. With fixed extraction costs and economies of scale, lignite is more profitable and will be kept open longer than coal. However, it has a lower calorific value and produces more emissions than hard coal. Mining produces particulates & non-CO2 emissions; waste from coal is not regulated and companies need to make provisions for land reclamation. Accelerated asset retirement obligations add financial risk; higher interest rates may raise provisioning costs.

2.1.1 Why coal now?

Russian gas supply issues have increased the importance of security of supply, prolonging coal asset lives. The German Government has approved the reopening of 10GW of mothballed coal until March 2024. Security of supply partly explains the failure of activist shareholder Enkraft’s attempt to persuade shareholders at RWE’s 2022 AGM to spin off lignite. Faced with higher CO2 prices, PGE instead plans to spin off its entire coal business to Government by January 2023. For Uniper, preserving the viability of German gas system supply may take priority over decarbonisation.

Long term supply contracts may be an obstacle to closing plants, such as Uniper’s Datteln4 or Maasvlakte3 and capacity market contracts, such as 75-95% of PGE’s coal capacity for 2022-24. In the case of supply contracts, RWE shareholders are unwilling to forgo these revenues. We believe it will be up to Government to negotiate compensation to achieve early contract termination. With respect to capacity market contracts at PGE, Government, not shareholders, will shortly have full liability; these contracts must end by July 2025 anyway.

Litigation risk may also dissuade Governments from policy ending fossil fuels because of the Energy Charter Treaty (ECT). The ECT was drawn up in the 1990’s with the aim of protecting international energy investments by foreign companies and the European Commission has proposed modernising the ECT. However, this has yet to be ratified; the law continues to protect EU fossil fuel investments made before August 2023. Although the terms of its stabilisation package prevent Uniper from pursuing compensation from the Dutch Government, RWE is still pursuing claims.

A key issue with Government ownership is that, with Governments needing to address competing priorities, security of supply, the rising cost of energy, protecting local jobs and economy, this slows the speed of decision making. As majority shareholders in PGE & CEZ, the Polish and Czech Governments have been very slow in building renewables, while nuclear is unlikely to be commissioned in either country before 2040. Despite substantial minority shareholders at RWE, shareholders including local government voted against proposals to spin off lignite.
2.2 What are the costs of keeping coal open?

2.2.1 Environmental Cost

First and foremost is the environmental cost of keeping coal open. The four companies profiled accounted for 162.6mt of European CO2 emissions from coal last year, of which nearly 80% is from PGE & RWE. Latest figures show an increase Y-O-Y of around 4%. As the German auctions for coal phaseout cover hard coal and there is a risk to current availability and price of hard coal, the real issue here is lignite.

This requires a mix of policy responses co-ordinated at European level, including carbon pricing, tougher air quality standards, Government support for renewables and other zero carbon technologies. The EU’s «Fit for 55» package in July 2021 made a start, aiming to cut emissions 55% by 2030 mainly by raising renewables from 32% to 40% of the EU energy mix. The RePowerEU package in May 2022 raised the 40% target to 45% and planned renewables capacity to 1,236GW from 1,067 GW. Additional capex is €210bn, of which €86bn for solar and wind.

2.2.2 Financial Cost

Second is the cost of keeping coal open to taxpayers, customers, bondholders and shareholders. With PGE 60.9% and CEZ 69.8% Government owned respectively, taxpayers in Poland and the Czech Republic are most exposed. This is particularly true of Poland, where CO2 emissions levels are highest and the cost of buying out the entire Polish coal sector (not just PGE) shortly falls to Government.

At current emission and CO2 price levels, Polish taxpayers will pay a further €6bn, more than PGE’s enterprise value (EV) for its CO2 emissions alone each year. At a time of a major cost of living crisis, it remains to be seen if the cost of buying out the entire sector is an issue in national elections in Poland, due in Autumn 2023. Polish customers are of course already paying for coal capacity payments in electricity bills. With Government subsidies, including new emergency payments to households burning coal for heating, Polish taxpayers are more exposed than consumers.

The German Government will soon be joining its Polish & Czech counterparts, with 30% ownership of Uniper. Although this may not be a strategic long term holding, there is still a major financial outlay which may need to go higher than €7.7bn depending on when and how the Russian gas supply issue is resolved. It is worth noting that a condition of German Government support is Uniper shareholders dropping compensation claims with the Dutch Government for reduced load factors at Maasvlakte.

Bondholders are also losing out from keeping coal open. This is because the rating agencies include ESG scoring in credit ratings based on GHG emissions, air quality and energy management. Fitch Ratings, for instance, grades ESG scoring on a scale of 1-5 with ‘3’ being neutral. PGE has ESG credit relevance scores of ‘4’ for GHG emissions, due to the dominant share of lignite and hard coal in its generation mix, which are carbon-intensive and under regulatory pressure in the EU. This has a negative impact on the credit profile and is relevant to the ratings in conjunction with other factors.

This leads to lower debt capacity as more restrictive environment policies create long term downward pressure on earnings, limiting funding for coal activities and triggering additional capex for energy transition. Stripping out with zero debt capacity fossil fuel EBITDA raises net 2021 financial debt/ EBITDA at all four companies, notably Uniper where the ratio nearly doubles from 1.1x to 1.8x.
Likewise with respect to shareholders, RWE's transformation from coal-based utility to renewables leader has clearly attracted a new investor base and has been rewarded by the market. However, even in RWE's case, simply adding a notional cost of one year's CO2 emissions would raise 2021 EV/EBITDA from 8.8x to 10.4x, PGE from 2.5x to 5.5x, Uniper from 2.1x to 3.2x, CEZ 10.2x to 10.7x.

Given that, with the recent exception of Uniper, the shares of all four companies have been driven higher by power prices, equity investors would benefit from more sustainable growth, particularly renewables, than volatile and likely unsustainable commodity prices in future. In contrast to PGE, RWE & CEZ share prices have closely correlated with CO2 prices, but this only raises coal & gas operating costs, making renewables still more competitive. Earnings growth is more highly valued from internal than external sources.

This leaves Uniper and PGE share and bondholders most exposed to a decline in commodity prices and fossil fuel earnings. Please see below.

**FIGURE 1: FOSSIL FUELS WEIGHT ON COMPANY EBITDA, 2021**

<table>
<thead>
<tr>
<th>Fossil Fuels % Group EBITDA</th>
<th>2021</th>
<th>Notes</th>
<th>Main EBITDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEZ</td>
<td>8</td>
<td></td>
<td>Nuclear, Distribution</td>
</tr>
<tr>
<td>PGE</td>
<td>32</td>
<td></td>
<td>Distribution</td>
</tr>
<tr>
<td>RWE</td>
<td>8</td>
<td>Estimate, lignite only</td>
<td>Renewables (wind)</td>
</tr>
<tr>
<td>Uniper</td>
<td>37</td>
<td>Europe 21/ Russia 16</td>
<td>Gas Midstream</td>
</tr>
</tbody>
</table>

Source: Company Data

**2.3 Gas**

This report looks at coal and the four CA100+ coal names, CEZ, PGE, RWE & Uniper. However, all four companies are looking to gas to decarbonise. We will look at gas and the major CA100+ gas names, Engie & Naturgy, in our next report. Nevertheless, two of the companies profiled here, RWE and Uniper are also major gas players.

We will argue that, rather than building new gas, the CA100+ names should be looking at retiring gas, not just coal, capacity to decarbonise. This is fundamentally because gas is losing its validity with respect to the energy trilemma, in terms of security of supply, affordability and climate security. The official view of RePower is that EU gas consumption will fall at a faster pace, limiting the rôle of gas as a transitional fuel.

Gas remains a vital fuel for heating and industry, particularly in Germany. Longer coal asset lives support the case for investing in gas pipelines, LNG terminals & storage facilities to improve security of supply. However, with respect to climate security, there are major issues with gas. RWE & Uniper accounted for a combined 35mt of EU CO2 emissions from CCGT output, around 15% of total, in 2021. Shipped gas by LNG has a higher carbon footprint than piped gas; methane is 80 times as damaging as CO2 to the atmosphere over 20 years.

**2.3.1 Gas to hydrogen not a quick, cheap fix**

All four companies are investing in « hydrogen ready » gas capacity and infrastructure. However, it is not clear how this will work. Although the RepowerEU plan cites green hydrogen from renewables as key to replacing natural gas, capacity is limited, costs are high and does not provide security of supply. Blue hydrogen from natural gas, mainly shipped by LNG, may address the problem, but is
most affordable when gas is converted to hydrogen where gas is produced, outside Europe. Hydrogen needs to be cooled much more than natural gas before shipping, adding cost.

Additionally, transporting pure hydrogen requires significant retrofitting to transmission & distribution grids. Feasibility studies are needed to assess the use of hydrogen in compressors. Although modern CCGT can run blends of natural gas containing 20-30% hydrogen, it will take time to scale up and commercialise turbines for burning pure hydrogen. Uniper hopes to have a first 100% hydrogen Siemens turbine with 300MW of capacity in Hamburg by 2030.

All this implies substantial cost. A new German electricity market design will address capacity mechanisms for new gas-fired power plants to run on hydrogen. Policy plans are to be converted into legislative proposals starting in 2022-23. The German Government is looking at subsidies to make green hydrogen competitive with grey. Additionally, CCUS may be cheaper than hydrogen in some countries, such as the UK and Netherlands.

2.3.2 Gas availability, cost and funding challenges

Russia’s invasion of Ukraine and EU sanctions have led to a fundamental reappraisal of security of gas supply in Europe. Related to this, the availability of gas and volatility of gas prices is leading to a review of some gas projects at the companies profiled, including PGE & RWE. The fragility of the gas system is highlighted by the challenges faced by Uniper’s German gas supply business.

The European Commission’s green taxonomy proposal classifies gas as green - only if it acts as a bridge until 2030 to more renewable sources. Hence, building gas exposes companies to the risk of stranded assets as regulatory change or technological improvements make it unprofitable. Germany, for instance, has announced a 2040 deadline for phaseout of gas. The European Investment Bank (EIB) has effectively ruled out investing in natural gas as inconsistent with its climate commitments; it will only fund investment in new CCGT emitting less than 270g CO2/KWh.

While part of PGE’s recent capital increase was intended for new CCGT capacity, funding for gas will become increasingly challenging in future. Without conversion to hydrogen, gas asset lives may become shorter to lend against. PGE risks destroying value with €2bn planned capex for new gas capacity entering service over 2023-26. CEZ is planning 1-1.5GW of new gas capacity, but this is not competitive with lignite, let alone renewables, as a bridge to new nuclear only due in 2038. RWE accepts there is a question over gas as a bridging fuel and is reviewing new build options.

2.4 Key Questions for All Companies

- We propose five company specific questions in each of the company notes.
- However, there are two key recurring issues worth highlighting across all four names:
  - None of these companies, with the exception of CEZ, have short term (2025) GHG reduction targets. However, we recognise that the current security of supply issue makes this a particular challenge at present.
  - None of these companies meet CA100+ assessment criteria on capital alignment. None of these companies meet criteria on plans to decarbonise capex or to disclose methodology to determine Paris alignment of future capex. All four companies need to be much more explicit on this point and, as a starting point, to disclose how much maintenance capex is needed to keep coal & lignite assets operating.
3. References

Company notes, CEZ, PGE, RWE & Uniper
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