Managing the transition from ‘coal to clean’

An overview of the key challenges using the example of Germany’s Coal Commission

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The recommendations of the German Coal Commission is not limited to a simple phase-out timeline – instead, it suggest the implementation of measures along five elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Phase out coal</td>
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<tr>
<td>B</td>
<td>Support transformation of traditional mining regions</td>
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<tr>
<td>C</td>
<td>Modernise the power system</td>
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<td>D</td>
<td>Alleviate hardship for those concerned</td>
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<td>E</td>
<td>Monitor and adjust measures</td>
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Authors’ figure based on Kommission WSB (2019)

The recommendations of the Commission

- Element A: Phase out coal step by step
- Element B: Support the transformation of traditional mining regions
- Element C: Modernise the power system
- Element D: Alleviate hardship for those concerned
- Element E: Monitor and adjust measures
A. Phase out coal
   No more new coal-fired power plants and mines
   Shut down existing plants step by step until 2035 or 2038 the latest

B. Support transformation of traditional mining regions
   Create new jobs and value added by investment and modernisation of infrastructure, research and innovation
   Indemnify recultivation of lignite mines

C. Modernise the power system
   Safeguard emission mitigation with more renewables, CHP and cancelation of CO2-certificates
   Ensure security of supply with monitoring, reserves and new capacity
   Make the power system more flexible with more grids and storage

D. Alleviate hardship for those concerned
   Maintain competitiveness of industries and affordability for households with power price compensations
   Compensate utilities for early shut downs
   Ensure a ‘Just Transition’ for employees with active labour market policies
   Conduct dialogue with resettlement affected near lignite mines

E. Monitor and adjust measures
   Monitor and report progress in 2023, 2026, 2029 and 2032
   Take additional action if needed
Phase-Out Plan of the Coal Commission

<table>
<thead>
<tr>
<th>Capacity in the market</th>
<th>Phase 1: Entry</th>
<th>Phase 2: Meet climate target 2030</th>
<th>Phase 3: Final Phase-Out</th>
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<tr>
<td>Instrument Hard Coal</td>
<td>Negotiations</td>
<td>Tenders</td>
<td>to be defined</td>
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<tr>
<td>Instrument Lignite</td>
<td>Negotiations</td>
<td>Negotiations</td>
<td>to be defined</td>
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GW vs Year Graph:
- Business as usual: 2022
- Coal Compromise: 2022
- Option: Phase-Out 2035: 2022
<table>
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<tr>
<th>Safeguard emission mitigation of phase out</th>
<th>Ensure security of supply</th>
<th>Make the power system more flexible</th>
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<tbody>
<tr>
<td>• Expansions of renewables to 65% of gross electricity consumption by 2030</td>
<td>• Expansion of measures to monitor security of supply</td>
<td>• Modernisation and better use of grids through optimisation, expansion and market measures</td>
</tr>
<tr>
<td>• Cancelation of CO$_2$ certificates</td>
<td>• Usage of existing reserve mechanism and replacement of decommissioned coal capacities from the reserve</td>
<td>• Promotion of storage systems</td>
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<tr>
<td>• Examination of appropriate CO$_2$ pricing in sectors outside emissions trading</td>
<td>• Continuation and modernisation of CHP support</td>
<td>• Review of the existing tax and levy system in the energy sector</td>
</tr>
</tbody>
</table>
The recommendations of the German Coal Commission follow a ‘Coal to Clean’ approach – coal should predominantly be replaced by renewables

Reference scenario

- Renewable energy is expanded in line with the capacity amounts in the Renewable Energy Act 2017.
- Development of coal power plants in the market is determined by their economic viability.

Coal compromise scenario

- Increase in the expansion of renewable energies to 65 per cent by 2030.
- Gradual phase-out of coal under the roadmap proposed by the Commission.

* The remaining parameters are not varied between the scenarios (see study for details).
Most of the decreasing electricity from coal-fired power plants will be replaced by renewable energies.

If one compares the electricity generation of the two scenarios for the year 2030, it becomes clear that the decline in electricity generation from coal-fired power plants by 80 TWh is predominantly being replaced by domestic renewable energies. A smaller part is compensated by the increased generation of gas-fired power plants.
In order to ensure security of supply with electricity and heat, the construction of some GW new gas-fired power plants (mid-merit/peak-operation) will be necessary in Germany.

### Generation capacities (net) in 2018, 2023, and 2030

**2018**
- In 2018, around 24 GW of gas-fired power plants operated in the market.

**2030**
- In the *reference scenario*, the capacity of gas-based plants in the market rises to around 28 gigawatts. The main reason for this is the already expected decommissioning of nuclear and coal-fired power plants.
- In the *coal compromise scenario*, the capacity of gas capacities operating in the market is around 36 GW and is thus 8 GW higher than in the reference scenario.

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Aurora Energy Research
One of the reasons, why the decrease in coal capacity can be accomplished by only some GWs of Gas: Regional integration, which minimises national flexibility needs

Wind generation can fluctuate from one hour to the next by up to 47% in Romania, whereas the comparable figure for Europe is just 6%.

In the SEE region, wind speeds show weak correlation, ranging from 11% to 46% between countries.

SEE follows a different wind generation pattern from northern European countries, which means wind production would not peak at the same time.

Conventional power plants will need to operate in a flexible manner. For economic reasons, hard coal and lignite will provide less than 25% of SEE power demand by 2030.

REKK (2019)
Financing challenge: Derisking measures are promising tools for enhancing RES. They lower LCOE of RES by 20%.

Derisking measures with the highest projected impact include:

- the proposed EU budget guarantee mechanism
- reliable, long-term RES remuneration regimes and/or support schemes, including long-term RES targets
- provisions to allow corporate PPAs
- open and well-functioning balancing and intraday markets that are regionally integrated

EU budget guarantee alone accounts for some 40% of the estimated financing cost decline in Serbia and Greece.

NewClimate Institute (2019)
## Support the transformation of traditional mining regions

<table>
<thead>
<tr>
<th>Creating new employment and value added</th>
<th>Indemnify recultivation of opencast lignite mines</th>
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<tbody>
<tr>
<td>・Modernisation of energy infrastructure including the expansion of renewables, grids, storage and PtX</td>
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<td>・Speeding up formal planning processes</td>
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<tr>
<td>・Developing 'model regions'</td>
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<tr>
<td>・Investment in transport and digital infrastructure as well as R&amp;D</td>
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<td>・Locating federal government offices and employees</td>
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<td>・Adapt of permits to changes in lignite demand</td>
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<tr>
<td>・Usage of the possibility of security payments when approving permit changes</td>
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<tr>
<td>・Usage of compensation payments for power plant operators for recultivation</td>
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<tr>
<td>Ensure socially acceptable implementation</td>
<td>Maintain competitiveness of commercial and industry</td>
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<td>-------------------------------------------------</td>
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<tr>
<td>Protections against dismissal, enabling early retirement without financial losses, provisions for retraining, and measures for reallocation to new jobs for coal workers</td>
<td>Continue and further develop CO₂ electricity price compensation at the European level</td>
</tr>
<tr>
<td><em>Power price compensation for households</em></td>
<td><em>Power price compensation for commercial and industry</em></td>
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<td><em>Engagement in dialog of regional governments with residents near mines</em></td>
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</table>
Thank you very much!

Haben Sie noch Fragen oder Kommentare? Kontaktieren Sie mich gerne:
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Agora Energiewende ist eine gemeinsame Initiative der Stiftung Mercator und der European Climate Foundation.