Managing the transition from 'coal to clean'

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

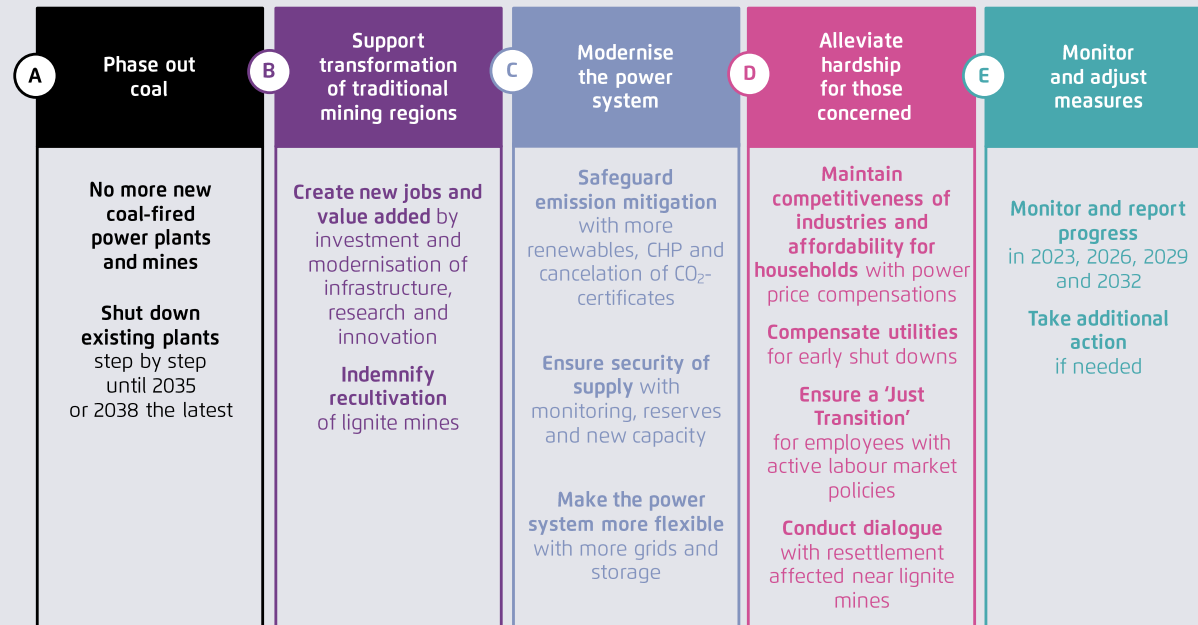**Philipp Litz**

BRUSSELS, NOVEMBER 2019

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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
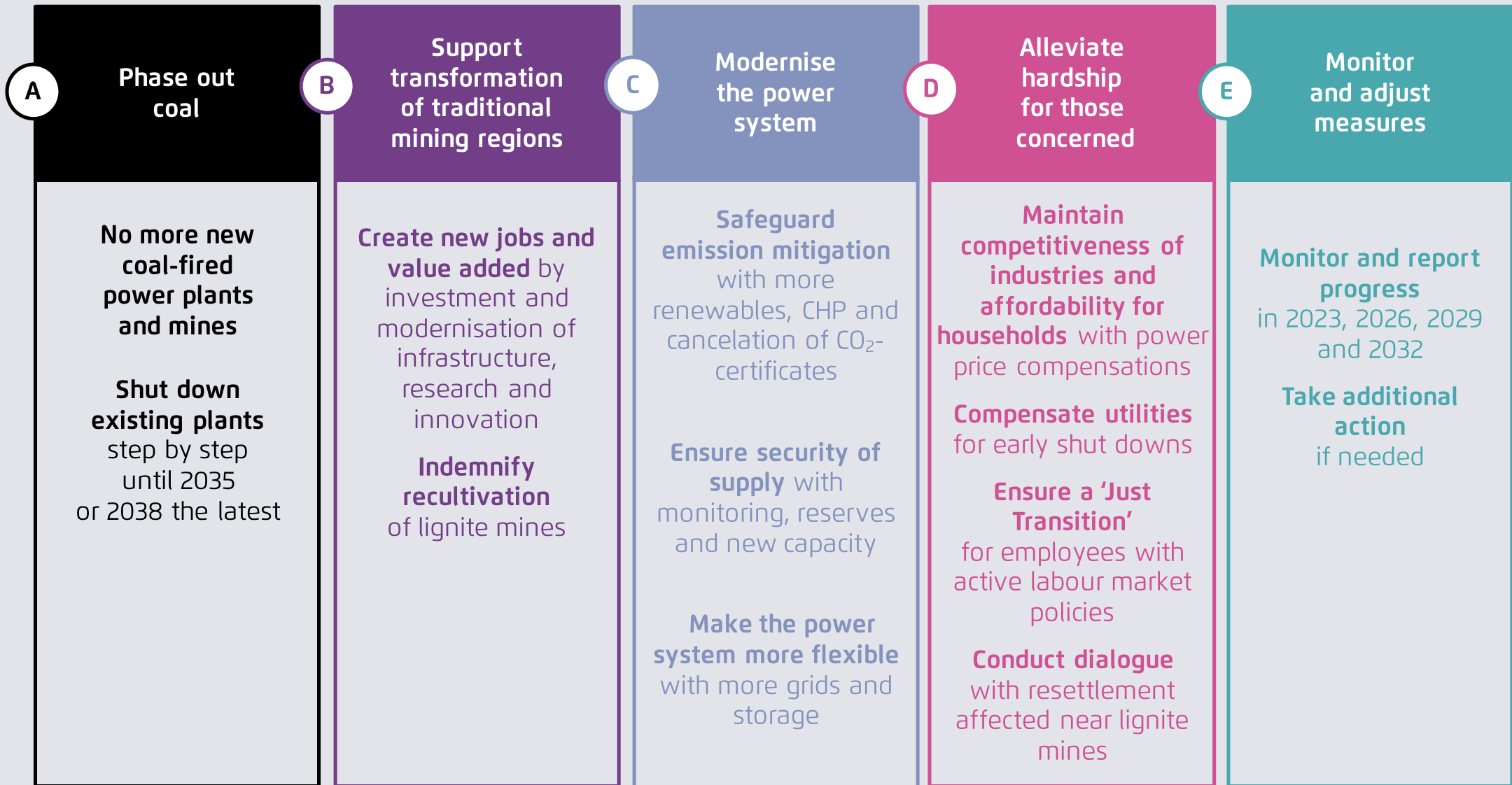
Overview of the recommendations of the Commission

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 CO_2-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

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

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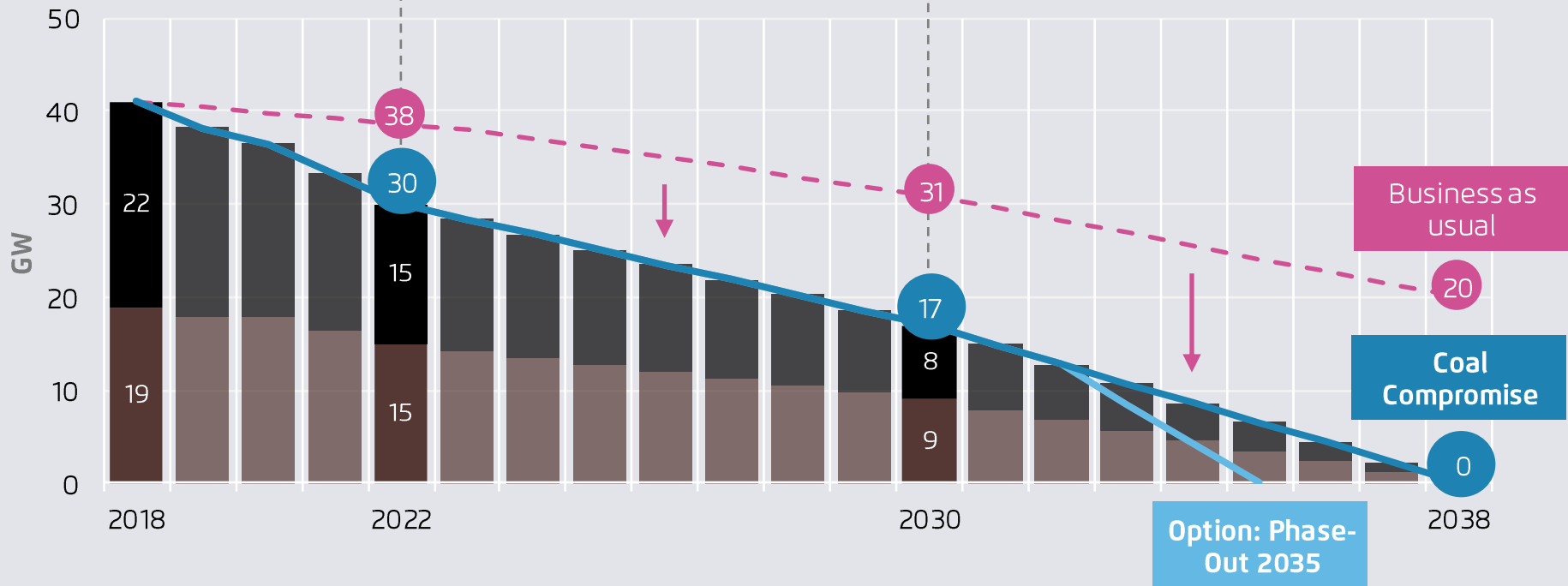**Conduct dialogue** with resettlement affected near lignite mines

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Phase-Out Plan of the Coal Commission

Capacity in the market	Phase 1: Entry	Phase 2: Meet climate target 2030	Phase 3: Final Phase-Out
Instrument Hard Coal	Negotiations	Tenders	to be defined
Instrument Lignite	Negotiations	Negotiations	to be defined

GW

2018   2022   2030   2038

38
30
17
0

31
20

Business as usual

Coal Compromise

Option: Phase-Out 2035

22
15
8

19
15
9
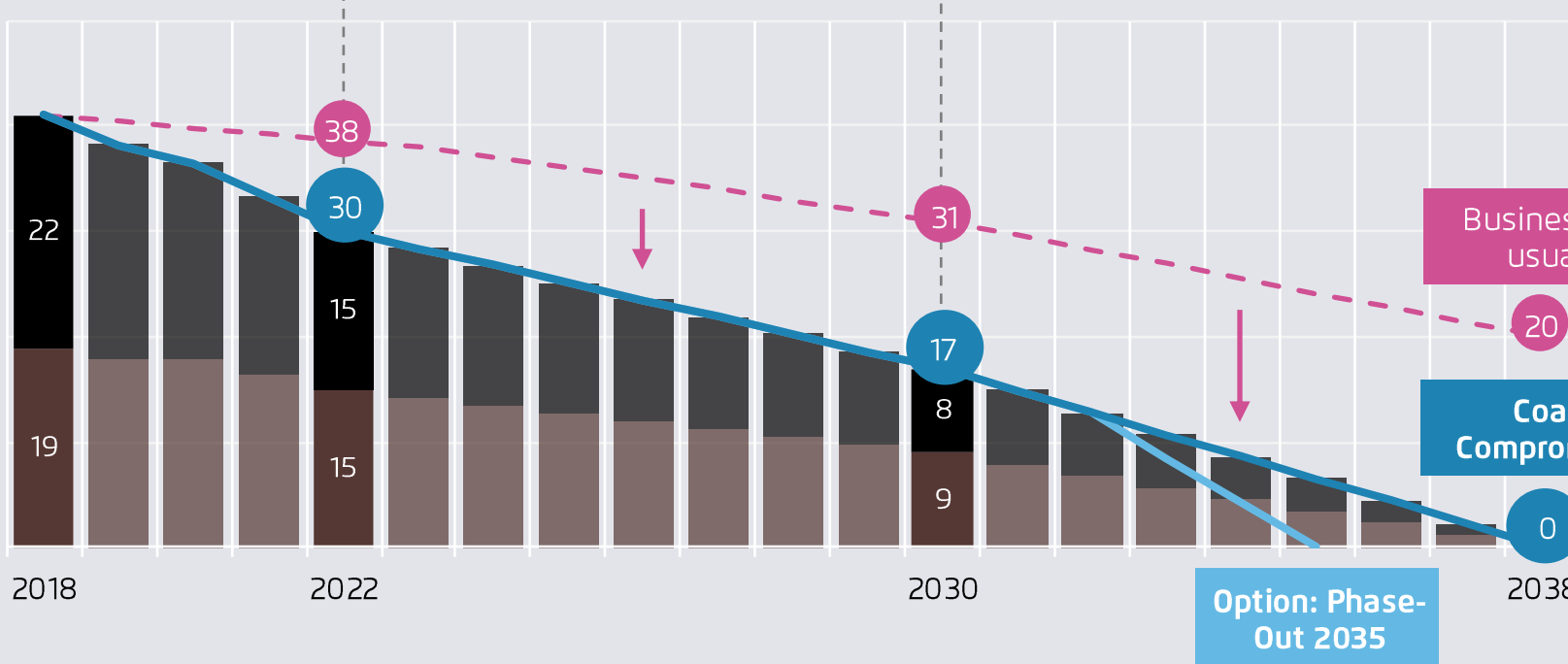
c Modernise the power system

Safeguard emission mitigation of phase out

- Expansions of renewables to 65% of gross electricity consumption by 2030
- Cancelation of CO_2 certificates
- Examination of appropriate CO_2 pricing in sectors outside emissions trading

Ensure security of supply

- Expansion of measures to monitor security of supply
- Usage of existing reserve mechanism and replacement of decommissioned coal capacities from the reserve
- Continuation and modernisation of CHP support
- Examination of capacity mechanism in 2023 if needed

Make the power system more flexible

- Modernisation and better use of grids through optimisation, expansion and market measures
- Promotion of storage systems
- Review of the existing tax and levy system in the energy sector

The recommendations of the German Coal Commission follow a 'Coal to Clean' approach – coal should predominantly be replaced by renewables

Coal capacity in the market and share of renewable energy 2018, 2023, 2030

Coal

Renewables

50 / 40 / 30 / 20 / 10 GW

Business-as-usual

Coal Compromise

70% / 60% / 50% / 40% / 30%

Coal Compromise

Business-as-usual

2018 / 2023 / 2030

Aurora Energy Research

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

Difference in net electricity generation between scenarios in 2030


Aurora Energy Research
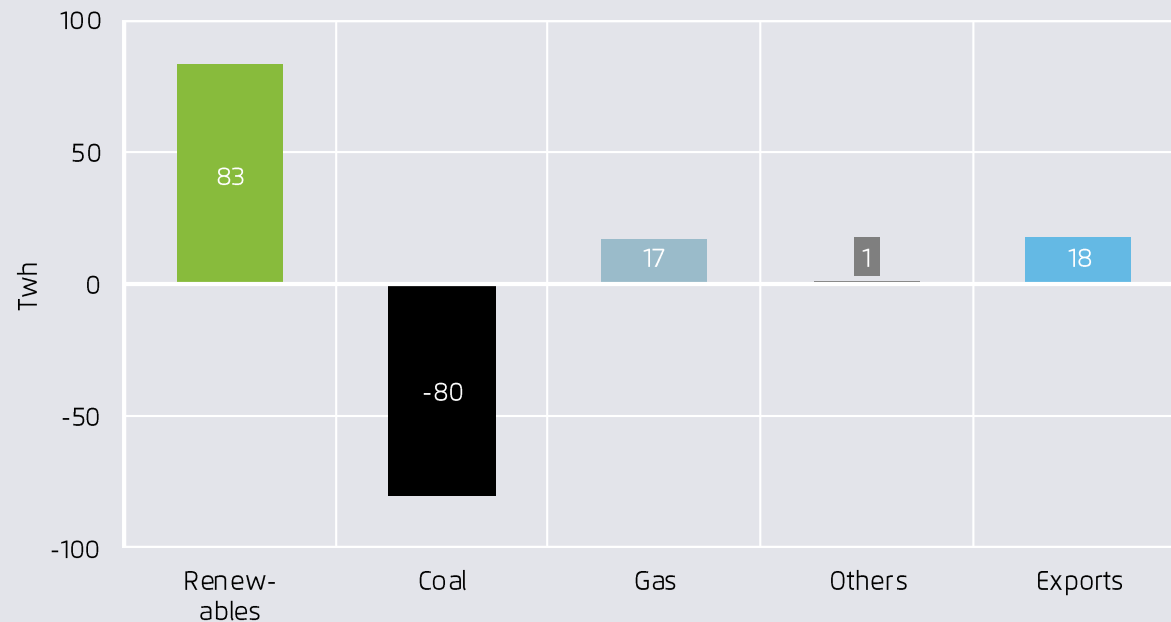
Reference scenario vs. coal compromise scenario in 2030

→ 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

Aurora Energy Research
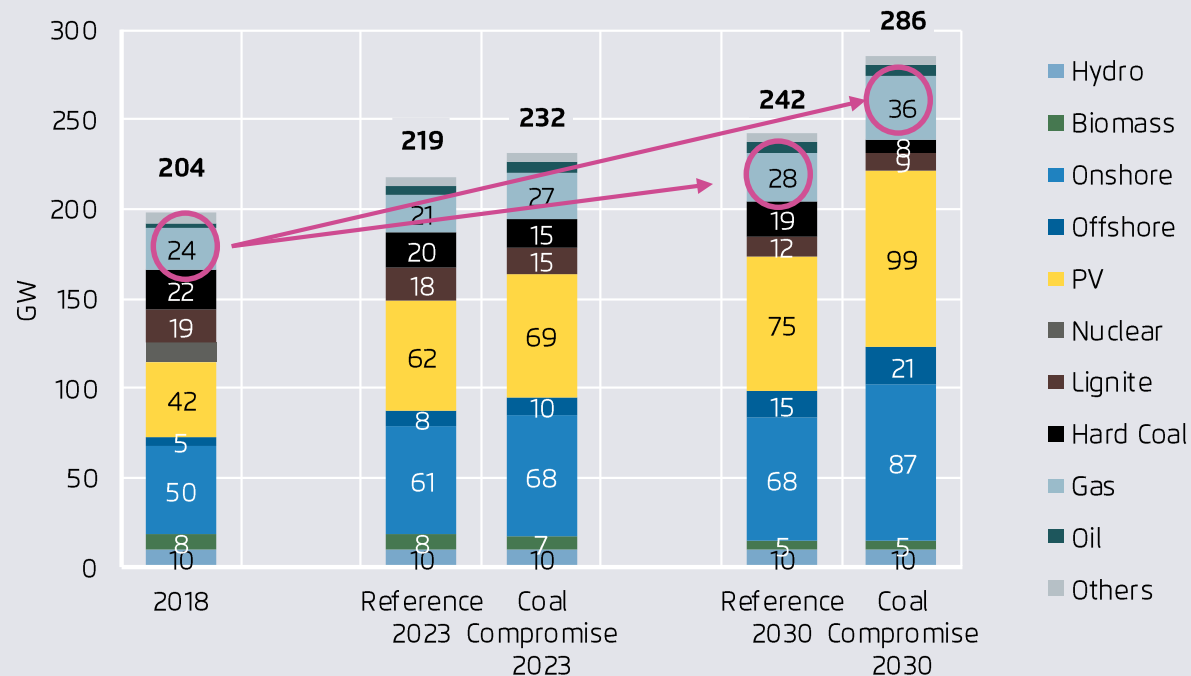
2018

→ 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.

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

Time series of onshore wind power generation in a simulation for the first week of 2030 at different levels of aggregation

REKK (2019)
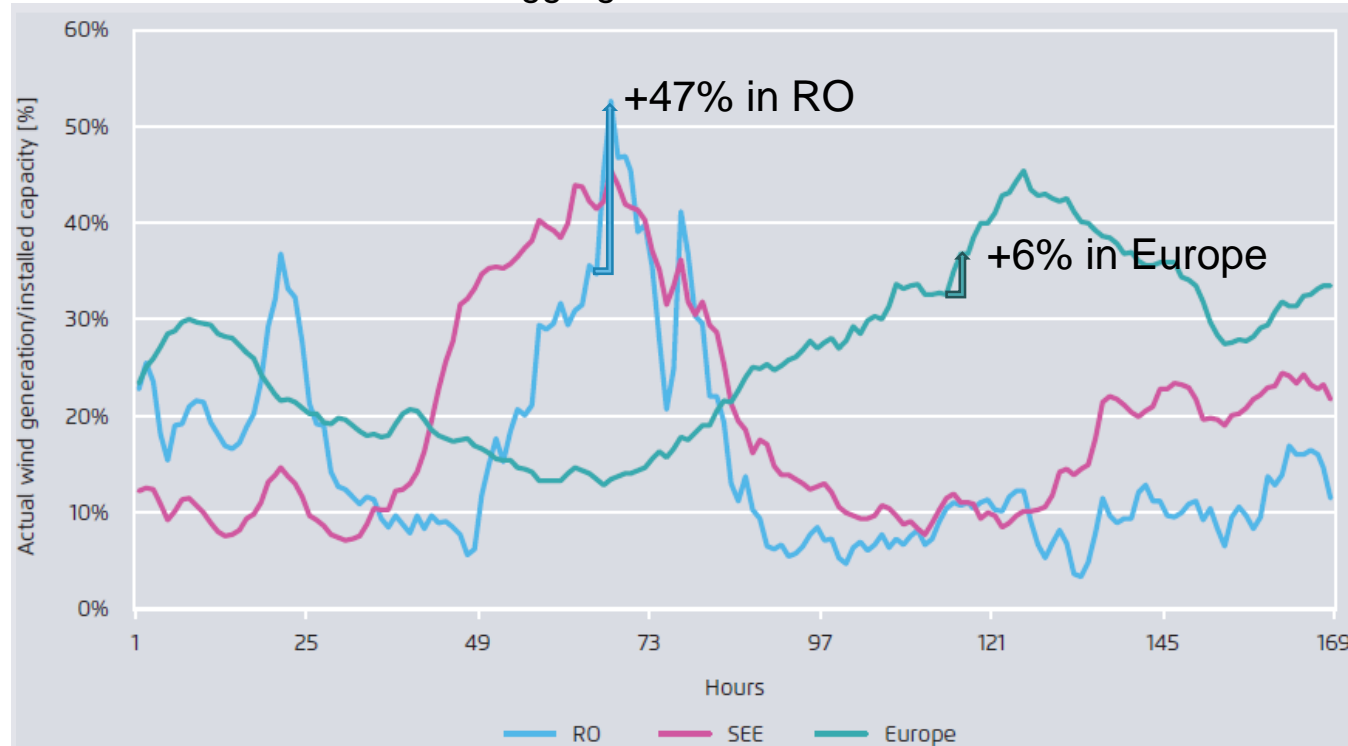
→ Wind generation can fluctuate from one hour to the next by up to 47% in Romania, whereas the comparable figure for Europe is just 6%

→ 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

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

LCOE comparison, lignite vis-a-vis onshore wind in Serbia and Greece

NewClimate Institute (2019)
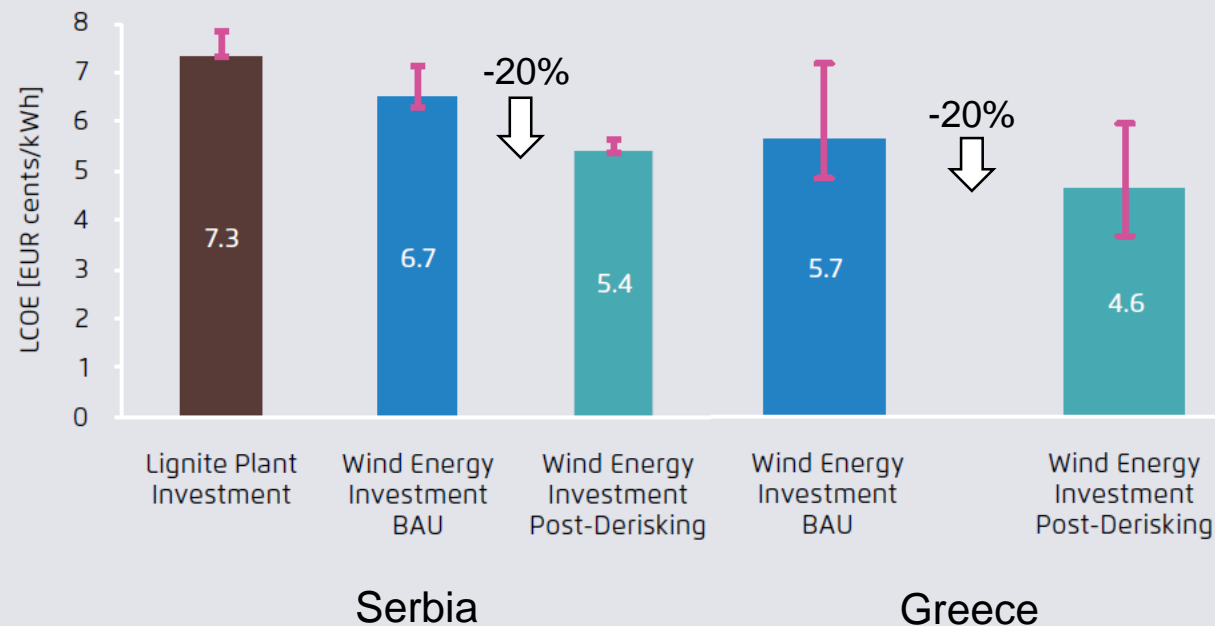
Derisking measures with the highest projected impact include:

- 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

B Support the transformation of traditional mining regions

Creating new employment and value added

- Modernisation of energy infrastructure in including the expansion of renewables, grids, storage and PtX
- Speeding up formal planning processes
- Developing ‚model regions'
- Investment in transport and digital infrastructure as well as R&D
- Locating federal government offices and employees

Indemnify recultivation of opencast lignite mines

- Adaption of permits to changes in lignite demand
- Usage of the possibility of security payments when approving permit changes
- Usage of compensation payments for power plant operators for recultivation

D Alleviate hardship for those concerned

Ensure socially acceptable implementation

- Protections against dismissal, enabling early retirement without financial losses, provisions for retraining, and measures for reallocation to new jobs for coal workers
- Power price compensation for households
- Engagement in dialog of regional governments with residents near mines

Maintain competitiveness of commercial and industry

- Continue and further develop CO_2 electricity price compensation at the European level
- Power price compensation for commercial and industry

Phase out in agreement with power plant operators

- Financial compensation for power plant operators for the early shut-down of capacities in a negotiative and/or competitive bidding process

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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.