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# Accelerated coal exit in BG, EL, RO

## Strategic Investment Plan

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Climate  
Foundation

**21 November 2019**  
**Energy Community Secretariat, Vienna**

**Disclaimer: the slides do not show the final results of the project.**



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**Project partners**



# Aim

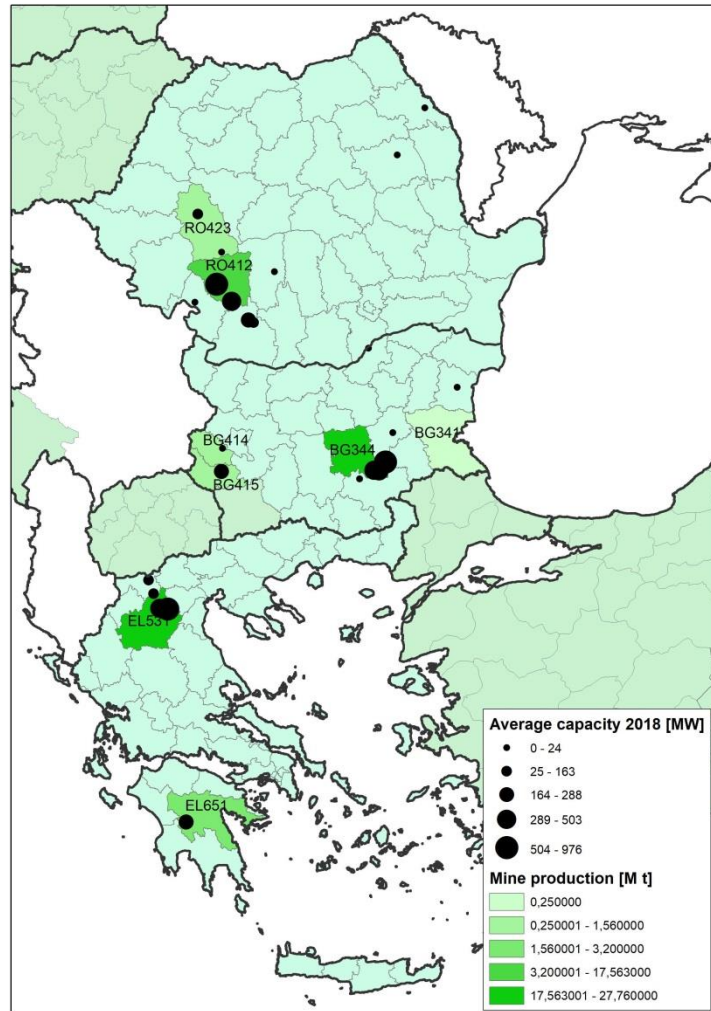
To reflect on the discussions on a just transition in BG, EL, RO

- Is it feasible to phase out coal?
- How much will it cost?
- Size of the economic and social benefits?

Two complementary work packages:

- Modelling the impact of an early coal exit on the electricity sector
- Estimating the cost of a just transition in the affected regions

# Lignite regions in BG, EL, RO



## 19 NUTS-3 lignite/coal regions in three countries

- 9 NUTS-3 regions with lignite/coal mining
- 80 million tons of lignite/coal production annually
- 17 NUTS-3 regions with existing lignite/coal power capacities
- 9376MW existing power capacities

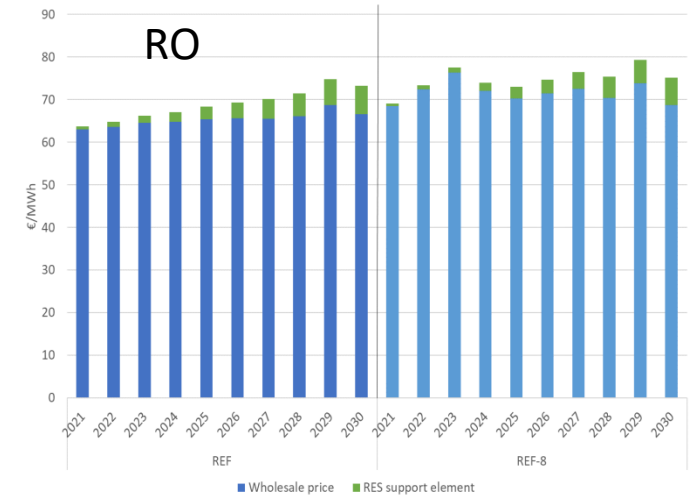
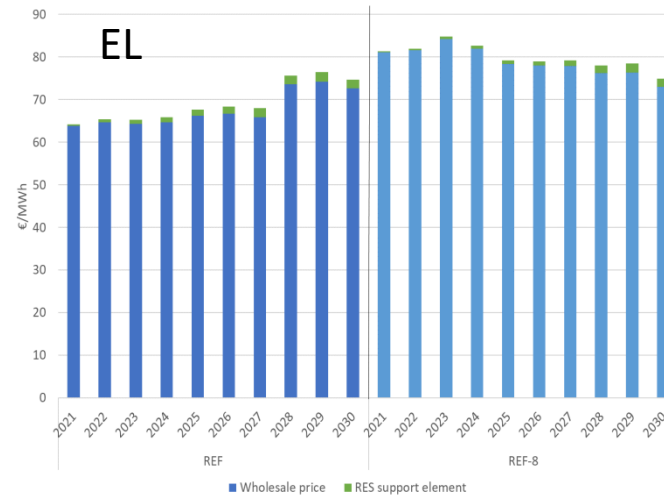
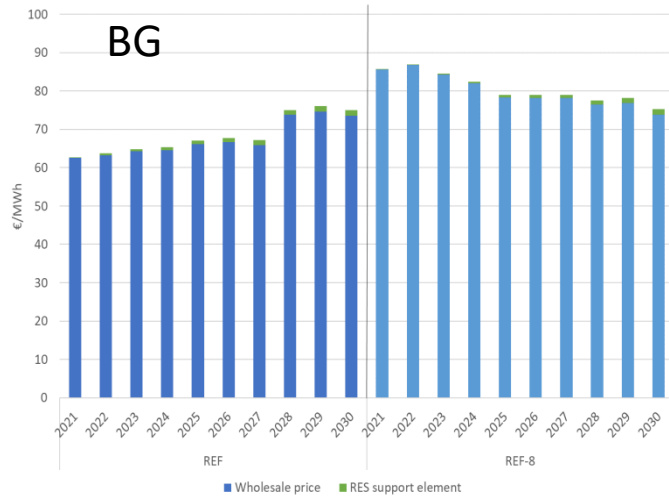
# Modelled scenarios

- Modelling for period 2018-2030
- RES-E targets for 2030 close to NECP target for GR, higher than NECP target for RO and BG
- Difference between scenarios in timing of coal phase-out:
  - Reference (REF) scenario: all power plants will operate until their lifetime
  - Early retirement due to IED (4 early retirement scenarios, -2, -4, -6 and -8 years from REF lifetime, but no early retirement before 2021)
- Sensitivity analysis:
  - Higher and lower CO2 price
  - Lower RES-E share

# Assessed results:

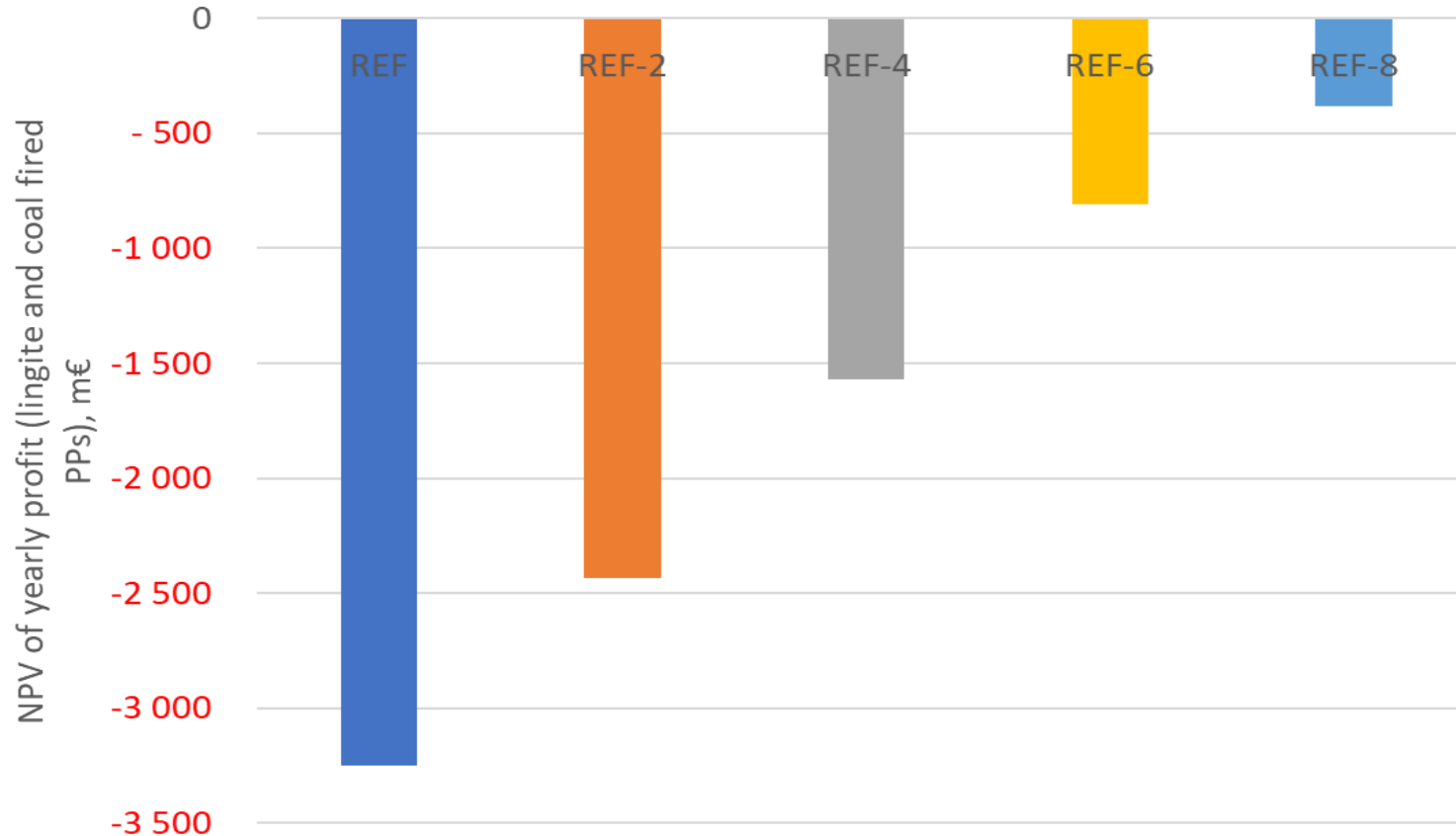
- Wholesale prices
- Profitability of power plants
- NPV of the profit of power plants
- Utilisation rates of coal/lignite and gas
- Electricity system impacts

# Wholesale prices



- Wholesale prices are higher with early retirement (right side of figures), but impact of early retirement varies between countries
- Prices in RO increase less than in BG and EL
- Energy poverty has to be addressed by policy makers if early exit is implemented

# NPV of annual profit of the lignite- and coal PPs in BG+EL+RO

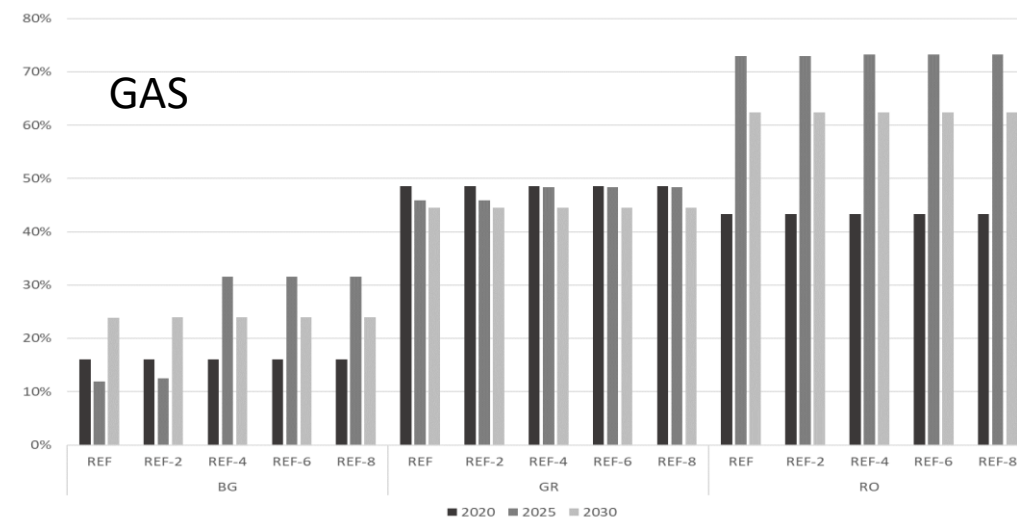
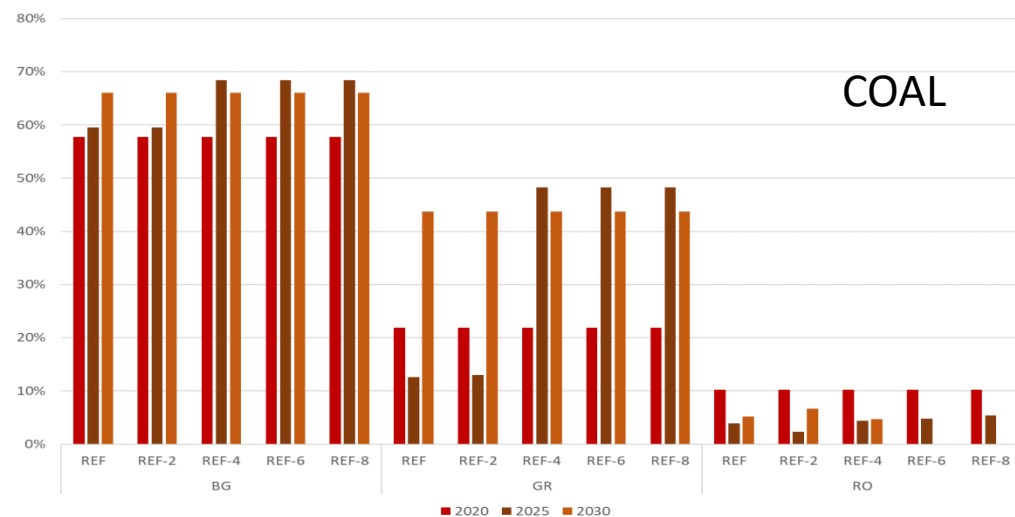


- Aggregated NPV of profit is negative in all scenarios
- Lower remaining capacity in REF-2,-4,-6 and -8 increases profit of remaining PPs
- Profit levels of the different scenarios converge from 2028
- Compensation for early coal exit at aggregate level not required, as PPs are making a loss due to high carbon price

Annual profit = Revenue from electricity production – variable costs – annual fix cost



# Utilisation rates



## Utilisation rates are country dependent

- BG: utilisation rate of coal high in all scenarios, and for gas low-medium. Expanding capacity of gas PP Varna from 420 to 1260 MW is not warranted.
- EL: coal utilisation rate increases with retirement of some PPs, gas utilisation does not change significantly. Investment in 826 MW gas capacity at Mytilianaioi is not warranted.
- RO: coal utilisation rates low in in all scenarios, gas utilisation high and increases further with early retirement of coal. 1600 MW increase in gas capacity has been assumed in all scenarios.

# Initial estimate of transition costs (thousand EUR)

	Bulgaria	Greece	Romania
Direct job transition	•220,322	•301,363	•112,086
Indirect job transition	•140,560	•268,077	•108,743
Indirect economy loss compensation	•425,241	•1,296,918	•383,761
Investment in sectors absorbing workers	•531,551	•1,621,148	•479,701
Compensation for local tax revenue	•94,387	•-	•80,515
<b>TOTAL COST</b>	<b>•1,412,061</b>	<b>•3,487,586</b>	<b>•1,164,805</b>
Reduction of losses in PPs	•1,300,000	•1,350,000	•620,000

# Calculations do not (yet) include

- Benefits of RES (new jobs, increase in GDP)
- Reduced external costs (air pollution)
- Recultivation and repurposing of affected mines and power plants
- Compensation for existing PPAs

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