A MULTI-CRITERIA, MULTI-ACTOR APPROACH TO GERMANY‘S COAL PHASE OUT: CONTRASTING SHORT WITH LONG-TERM OPTIONS

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GERMAN COAL PHASE OUT

Environmental Drivers

- ***Paris Agreement: 1.5 degrees ambition***
- ***Post 2010 stagnation in German emission reductions*** [Kommission Wachstum Strukturwandel und Beschäftigung, 2019]
- ***Negative impacts of coal mining*** [von Hirschhausen & Oei, 2013]
- **Ancillary benefits** (reduced air pollution) [Davis et al., 2000]

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GERMAN COAL PHASE OUT

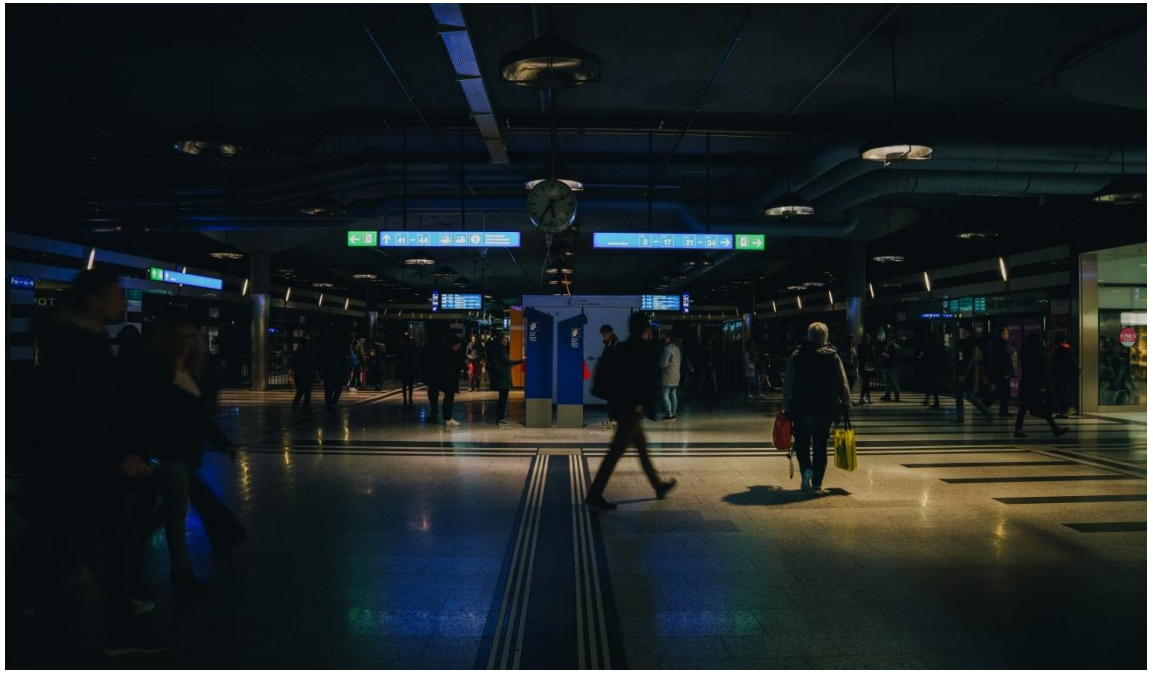
Economic and Social Challenges

- ***Employment: esp. under accelerated scenarios*** [Enervis, 2016]
- ***Importance of coal to certain communities*** [Morton & Müller, 2016]
- ***Renaissance of coal in the 2000s: danger of stranded assets*** [Pahle, 2010]

GERMAN COAL PHASE OUT

Controversies

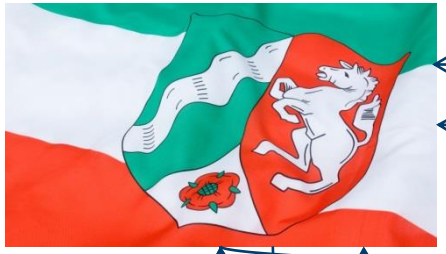
- ***Implications for power system reliability*** [Leipprand & Flachsland, 2018][Agora Energiewende, 2018]
- ***Security of supply: NG mostly imported & gas infrastructure underused*** [Wilson & Staffell, 2018]
- ***System costs*** [Heinrichs & Markewitz, 2017][Kommission Wachstum Strukturwandel und Beschäftigung, 2019]



DECISION ANALYSIS AND ENERGY SCENARIOS

COMPETING PRIORITIES IN GERMAN COAL PHASE OUT

CRITERIA / ACTORS	Environmental	Economic	Security	Cost to Govt
Government	x	x	x	x
Regional Gov.	X	x	x	x
Consumers	x	x	x	
Industry		x	x	
Business Associations	x	x		
Unions		x		
NGOs & Civil Society	x			

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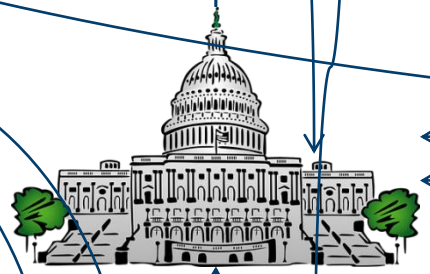



WE DONT
HAVE TIME

POLICY OPTIONS FOR COAL PHASE OUT IN GERMANY

Conflicting Views

Coal Phase out by 2030, at the latest

Resistance to coal phase out; promote more gradual approach – i.e. carbon cap

POLICY OPTIONS FOR COAL PHASE OUT IN GERMANY

3 Main Options

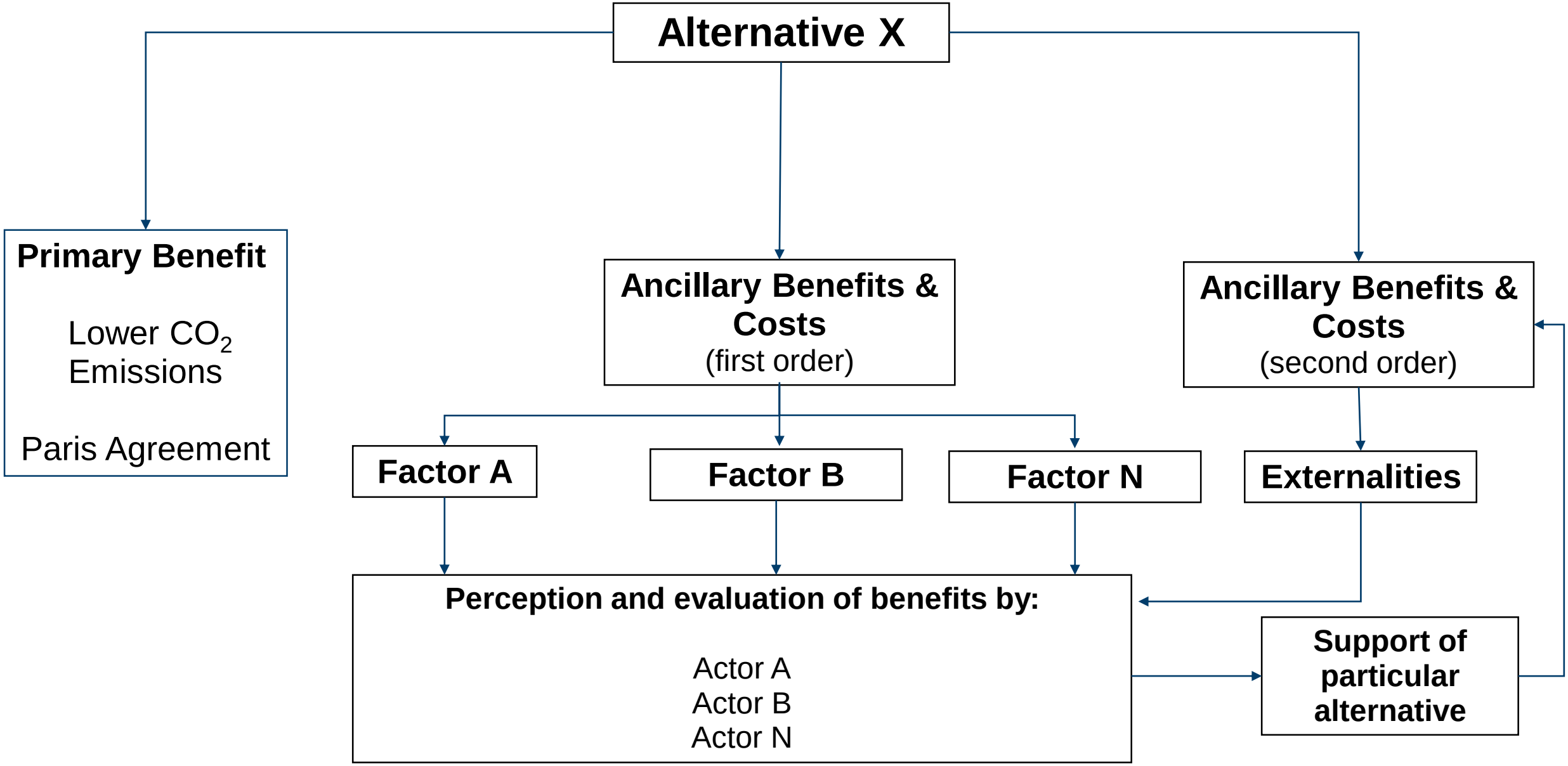
- Long-term phase out
  - ➢By 2038
  - ➢Possibility to bring forward to 2035

- Early phase out
  - ➢Complete phase out by 2030
  - ➢¼ of plants shut down in 2019

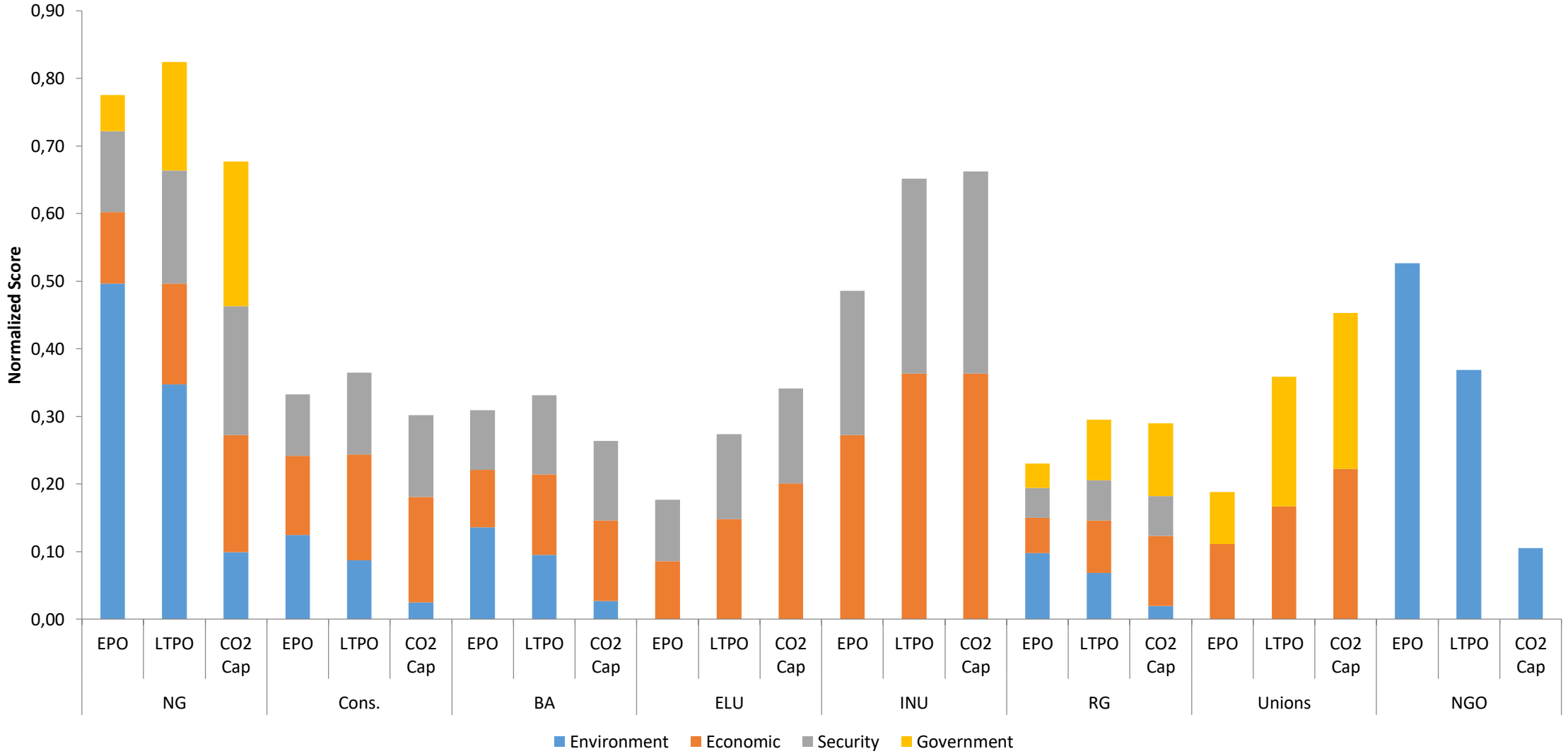
- CO2 cap under an improved EU ETS scheme [Heinrichs & Markewitz, 2017]:
  - ➢Improved EU ETS
  - ➢Market mechanism to deliver phase out

OUR GOALS

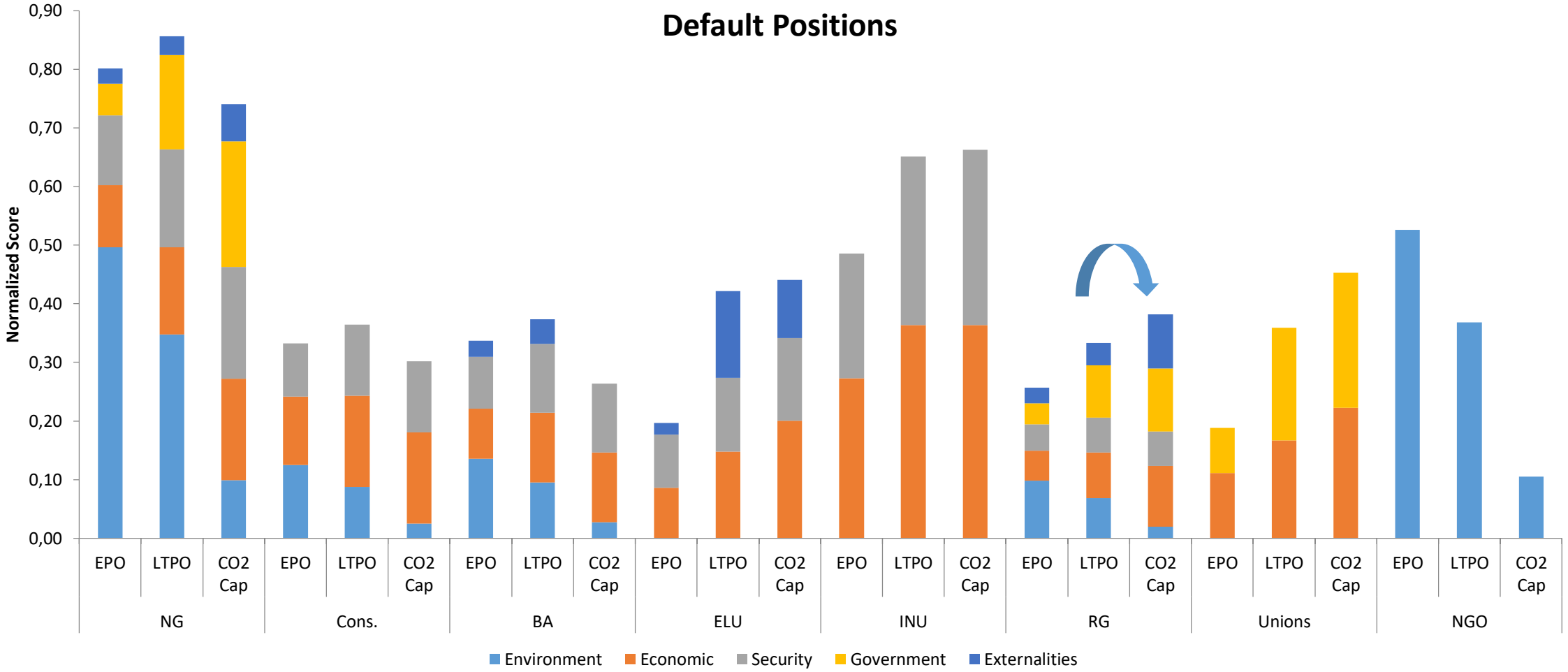
- Structured decision analysis
- Where are the points of resistance to coal phase out policies?
- How important are externalities in determining actors' preferences?
- Which aspects should gain particular focus in the phase out process?


Alternative X
Primary Benefit
Lower CO_2 Emissions
Paris Agreement
Ancillary Benefits & Costs
(first order)
Ancillary Benefits & Costs
(second order)
Factor A
Factor B
Factor N
Externalities
Perception and evaluation of benefits by:
Actor A
Actor B
Actor N
Support of particular alternative

RESULTS WITHOUT EXTERNALITIES



RESULTS WITH EXTERNALITIES



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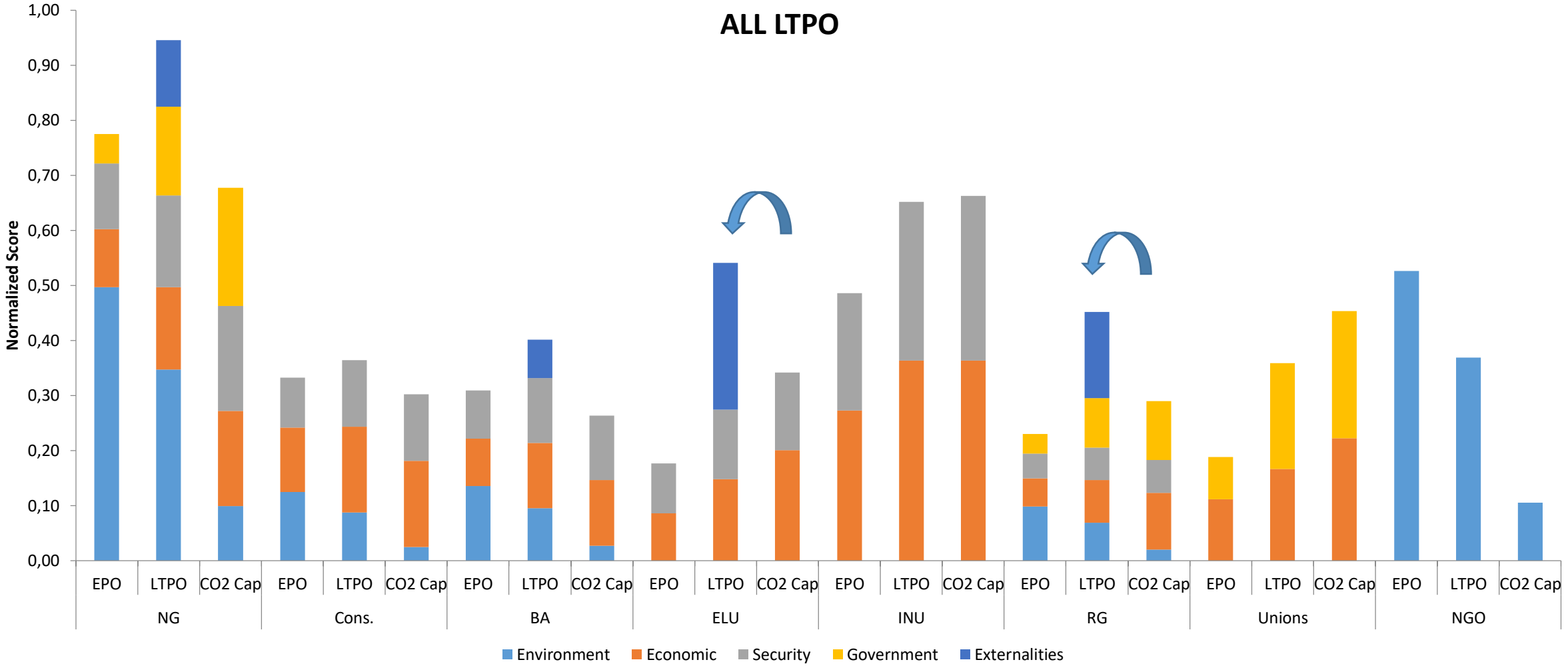

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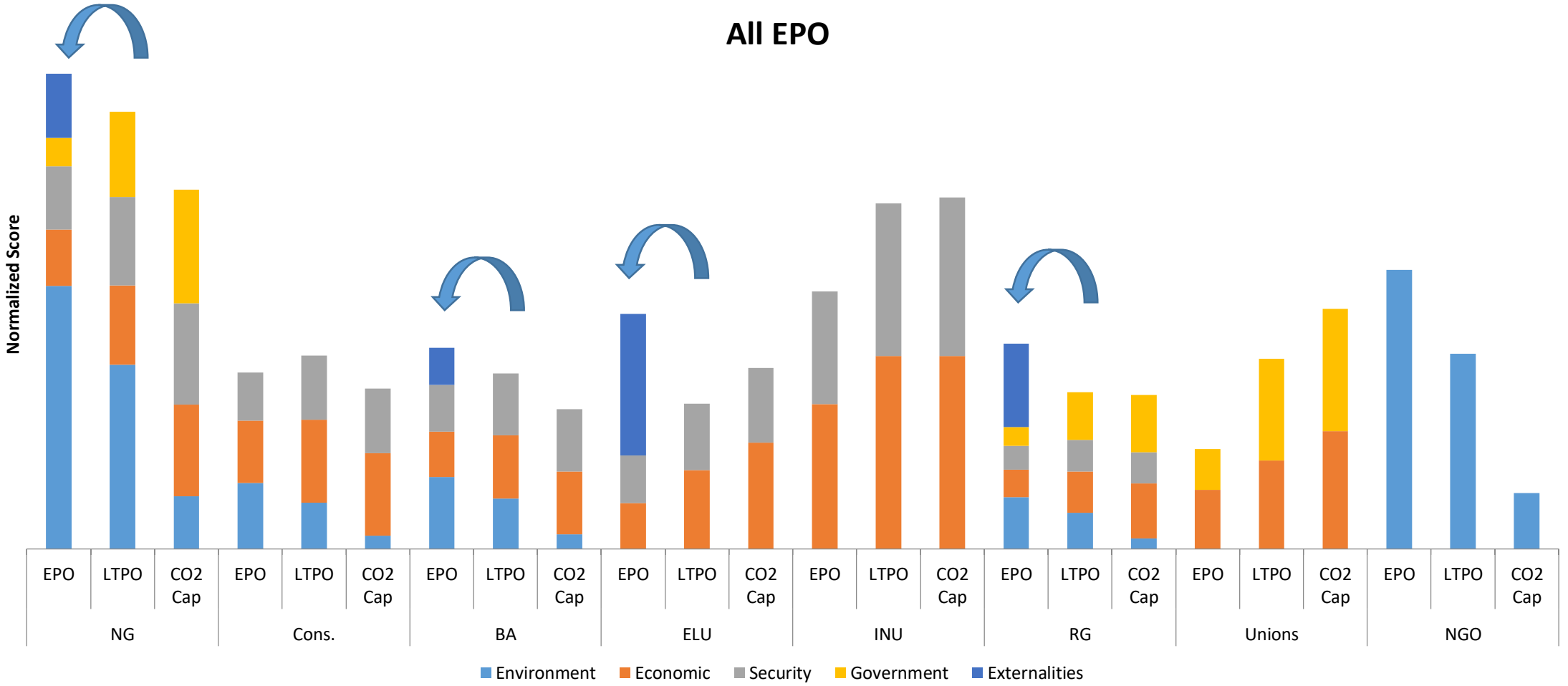

CONCLUSIONS

- Resistance concentrated in a few actors
  - ➢ Intractable social and economic problems
  - ➢ Local-level problems
  - ➢ Getting the structural change right is crucial to success

- Externalities could be powerful
  - ➢ Changing attitude of certain actors
  - ➢ Ripple effect: these actors‘ change in stance could lead others to change

REFERENCES

AGORA ENERGIEWENDE (2018) *Die Energiewende und die französische Transition Energetique bis 2030*. Agora Energiewende & Institut du développement durable et des relations internationales, Berlin.

DAVIS, D. L., KRUPNICK, A. & MCGLYNN, G. (2000) *Ancillary benefits and costs of greenhouse gas mitigation*. OECD, Paris.

ENERVIS (2016) *Gutachten: Sozialverträgliche Ausgestaltung eines Kohlekonsenses*. ver.di, Berlin.

HEINRICHS, H. U. & MARKEWITZ, P. (2017) Long-term impacts of a coal phase-out in Germany as part of a greenhouse gas mitigation strategy. *Applied energy,* 192**,** 234-246.

KOMMISSION WACHSTUM STRUKTURWANDEL UND BESCHÄFTIGUNG (2019) *Abschlussbericht*. Bundesministerium für Wirtschaft und Energie (BMWi), Berlin.

LEIPPRAND, A. & FLACHSLAND, C. (2018) Regime destabilization in energy transitions: The German debate on the future of coal. *Energy research & social science,* 40**,** 190-204.

REFERENCES

MORTON, T. & MÜLLER, K. (2016) Lusatia and the coal conundrum: The lived experience of the German Energiewende. *Energy Policy,* 99**,** 277-287.

PAHLE, M. (2010) Germany's dash for coal: Exploring drivers and factors. *Energy Policy,* 38:7**,** 3431-3442.

VON HIRSCHHAUSEN, C. & OEI, P. (2013) *Gutachten zur energiewirtschaftlichen Notwendigkeit der Fortschreibung des Braunkohleplans "Tagebau Nochten"*. Deutsches Institut für Wirtschaftsforschung, Berlin.

WILSON, I. G. & STAFFELL, I. (2018) Rapid fuel switching from coal to natural gas through effective carbon pricing. *Nature Energy,* 3:5**,** 365.