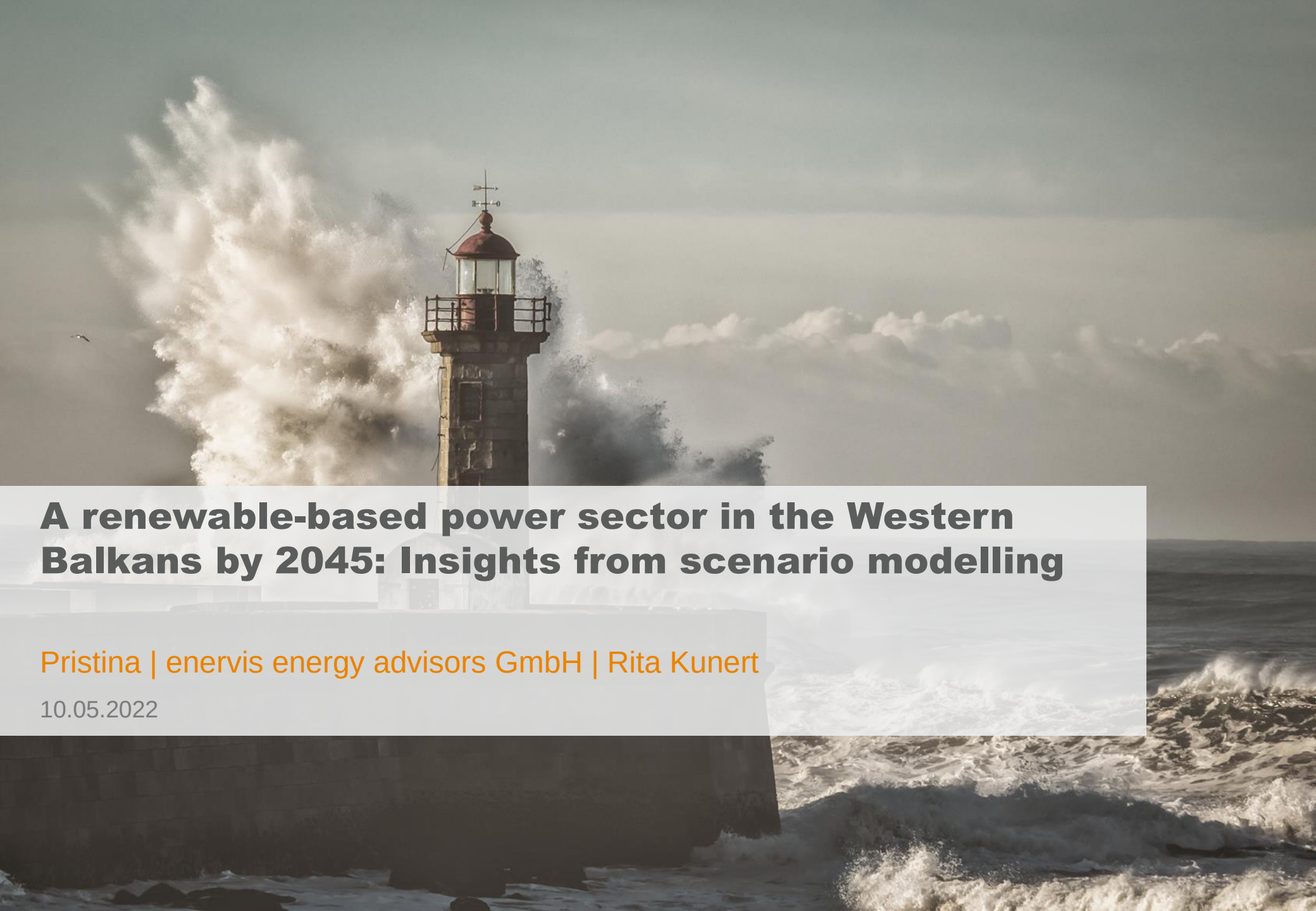


A renewable-based power sector in the Western Balkans by 2045: Insights from scenario modelling

Pristina | enervis energy advisors GmbH | Rita Kunert

10.05.2022

Three power market scenarios were designed, modeled & analysed to compare different energy policy strategies

METHODOLOGY

SCENARIO DESIGN
- Definition of political scenarios
- Basis for power market modeling

ASSUMPTIONS
- Techno-economic parameters
- Fuel prices
- RES, coal trajectories

MODELING
- Plant dispatch & investment to 2050
- Capacity & generation mix

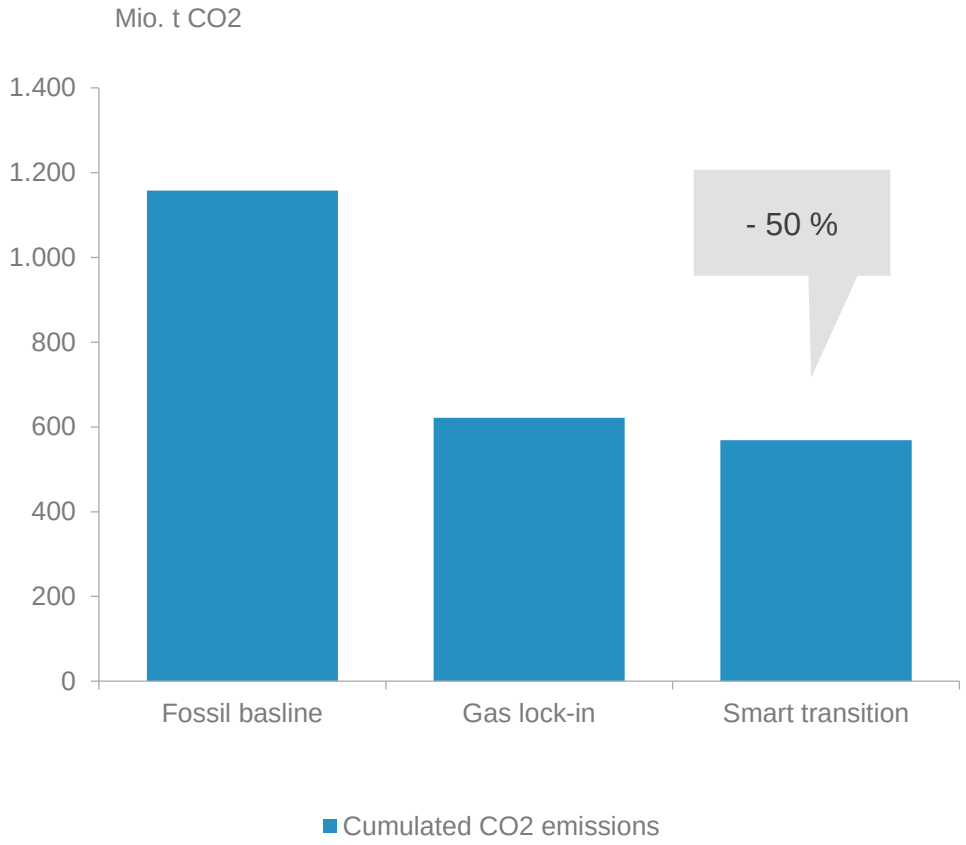
RESULTS
- CO_2- and other emissions
- Investment needs
- Total system costs

SCENARIOS

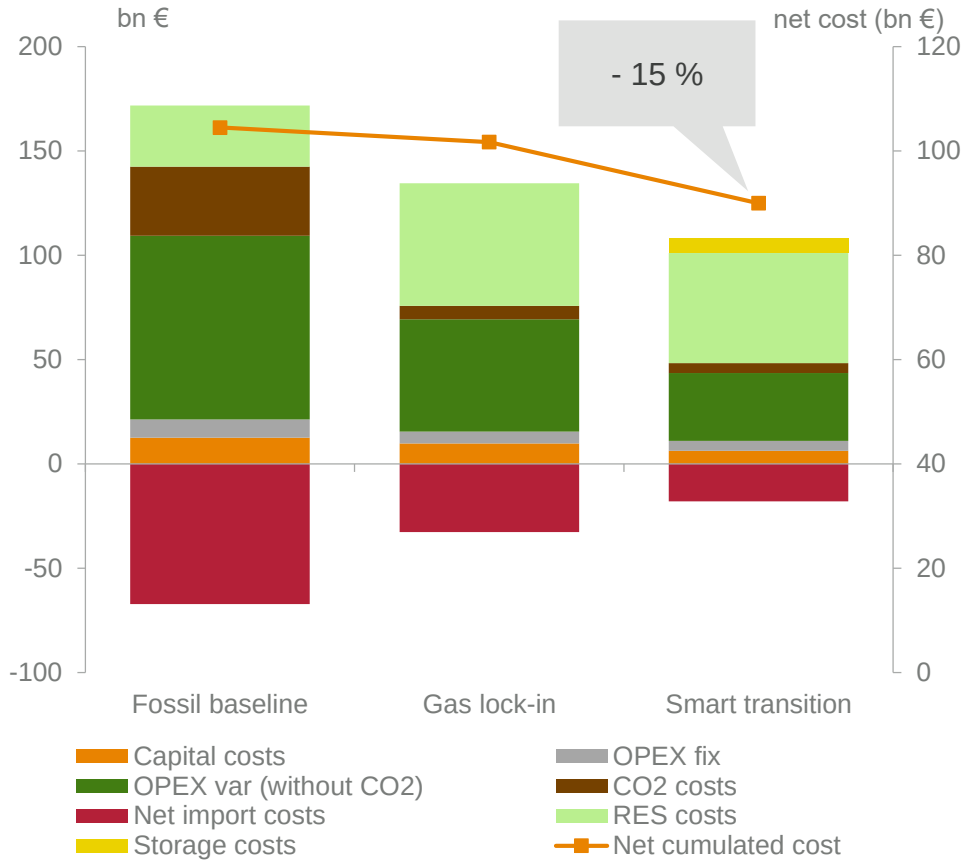
	DESCRIPTION	NET-ZERO DEADLINE	DECARBONISATION TECHNOLOGIES
FOSSIL BASELINE	Baseline scenario with current ambition level, no lignite exit, no power sector decarbonisation	-	
GAS LOCK-IN	Net-zero power sector scenario with RES & H2, early investments into fossil gas plants, late retrofit to H2	2045	H_2
SMART TRANSITION	Net-zero power sector scenario with RES, H2 & storages, earlier H2-readiness of gas units	2045	H_2

A net-zero scenario with diverse technology portfolio cuts carbon emissions while resulting in lower incremental generation costs

Cumulated CO_2 emissions 2022-2050

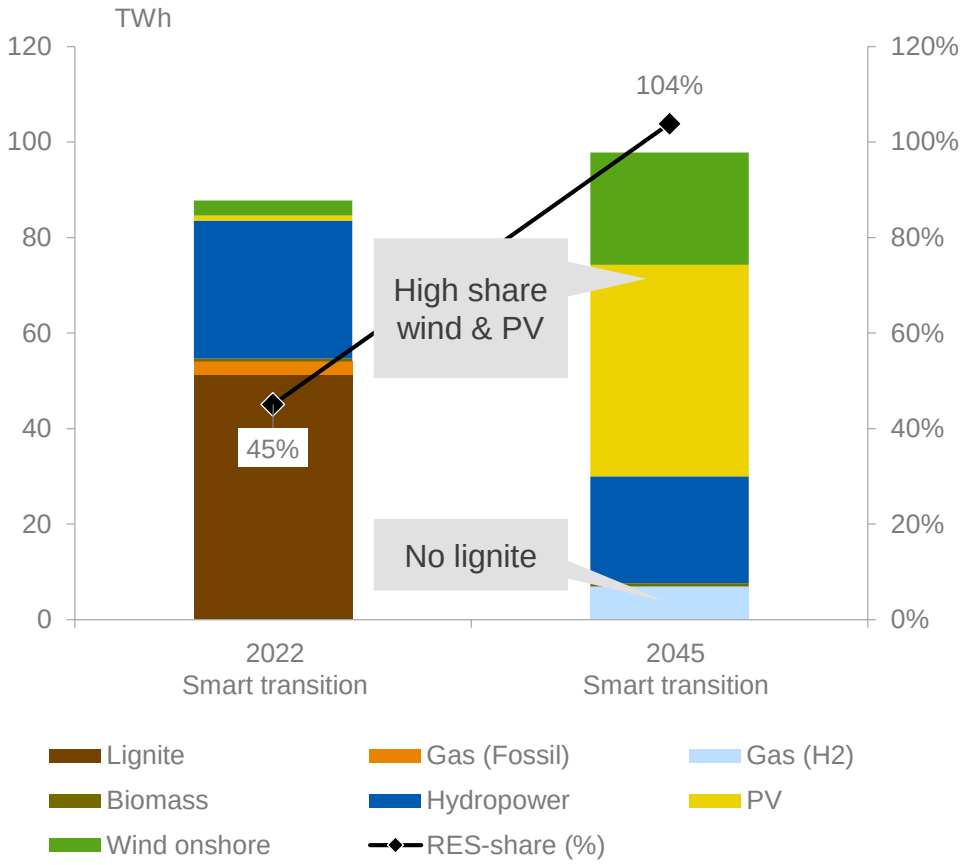


Incremental generation costs 2022-2050

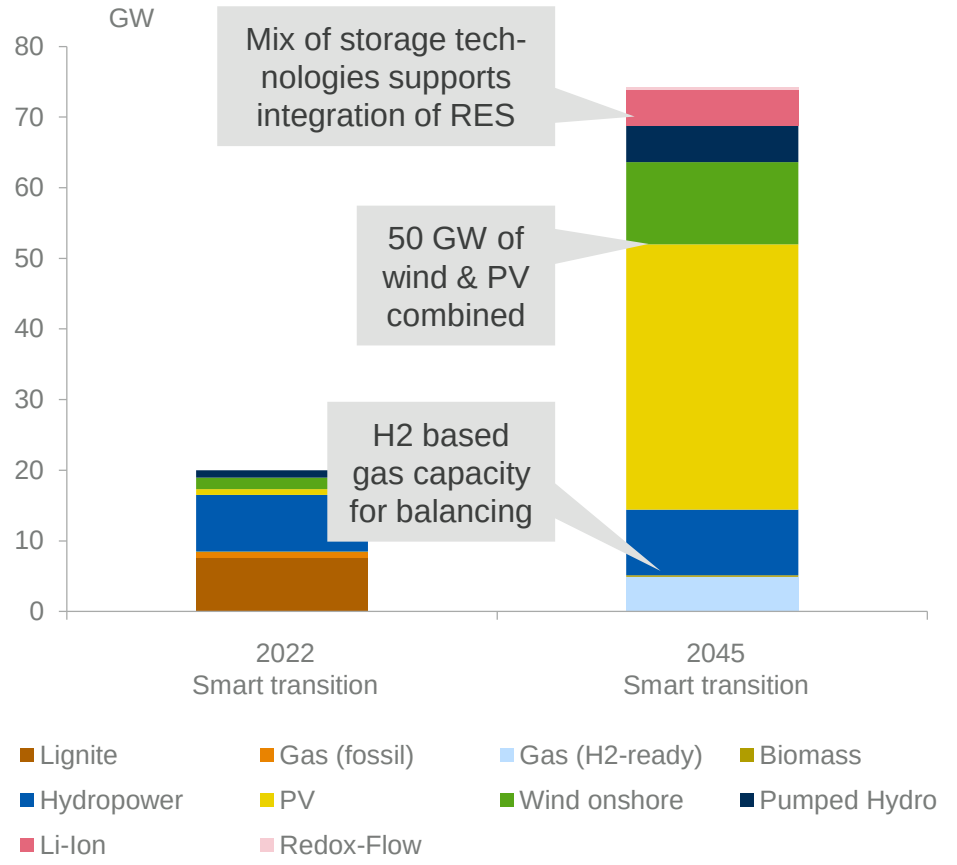


RES & storage based power system delivering these results implies adding roughly 50 GW of onshore wind and PV capacities in the next three decades

Generation mix in Smart transition sc.

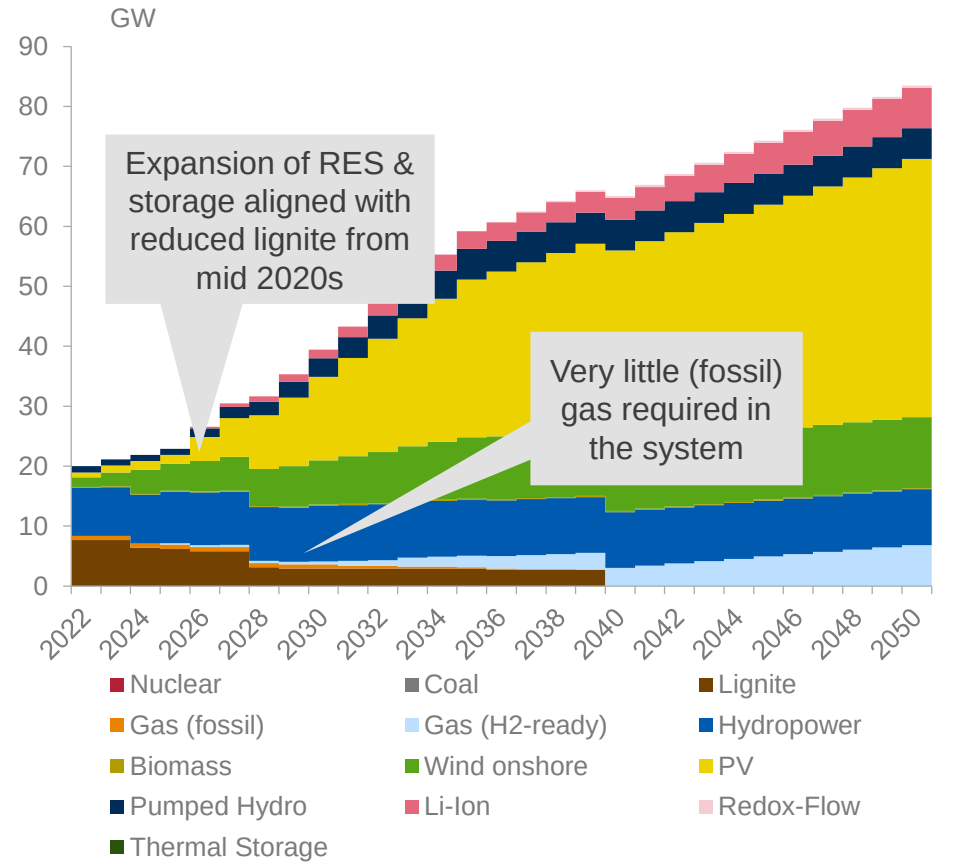


Capacity mix in Smart transition sc.

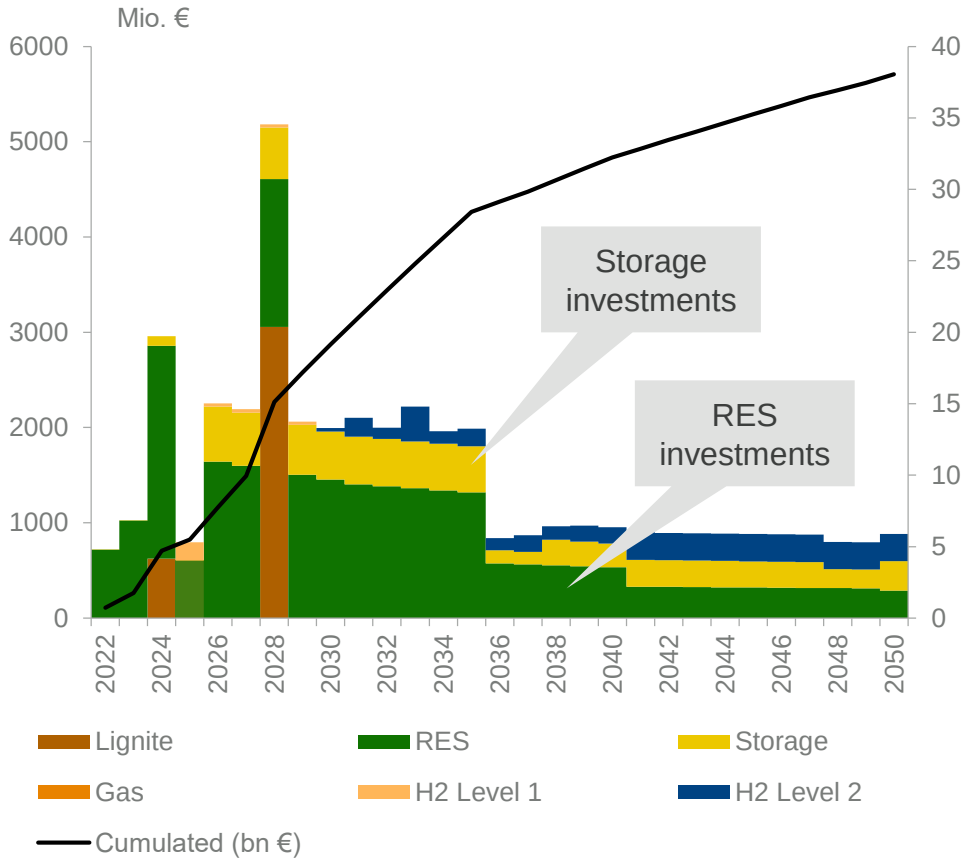


RES capacity expansion & respective investments into the power sector transition concentrate within the next 1.5 decades

Capacities in Smart transition sc.



Investments in Smart transition sc.



Conclusions

Power market decarbonisation by 2045 is possible and cost efficient

- A decarbonisation of the power sector by 2045 is possible while saving costs. The energy transition scenarios cut cumulated CO_2 emissions by half (46-51%) while reducing overall generation costs by ~3-15% (compared to the baseline scenario). Security of supply is ensured in the energy transition scenarios.

Vast amounts of RES are required for the transition

- Installations of wind onshore and PV, today combined at below 5 GW in the region, will provide the majority of electricity in a net-zero scenario in the mid and long run, balanced with storage solutions
- Combined capacity of onshore wind and PV will have to increase more than tenfold

RES capacity expansion & investments concentrate in the next decades

- In order to align with a sensible lignite reduction path of lignite generation, around 3 GW p.a. of wind onshore and PV, have to be added in the decade between to 2035
- A framework for facilitating required investments is thus necessary, the sooner the better

Disclaimer

To the extent permitted by law and if not contractually specified otherwise enervis does not accept or assume any liability, responsibility or duty of care for any consequences of acting, or refraining to act, in reliance on the information contained in this document or for any decision based on it.

The data and information contained in this document have not been collected or reviewed by enervis and are partly publicly available. Therefore, enervis does not assume any liability for the correctness and completeness of the data contained in this document.

This document does not take into account events that occurred after this time, nor their effects.

This document contains forward-looking statements and reflects the current perspective regarding future events and market developments. Actual results may differ materially from the expectations expressed or implied in this document due to known and unknown risks and uncertainties.

The contents presented here are inseparably linked to the specific question or project and are only valid under the contractual conditions agreed with the client, which may not be accessible from the document itself. This applies in particular to documents that are not explicitly marked as expert opinions. The transferability to other issues (such as in legal proceedings and arbitration) is generally not given and would have to be examined by enervis in individual cases and confirmed in writing. Documentations that are marked as "short studies" only briefly reproduce the contents of a project. Documentations marked as "results papers" also focus on the results of a project and do not deal in detail with assumptions and methodology.

Readers should not act upon the information contained in this document without obtaining specific professional advice (like consultants, lawyers).

www.enervis.de

enervis energy advisors GmbH
Schlesische Str. 29-30
10997 Berlin
Germany
Fon +49 (0)30 695175-0
Fax +49 (0)30 695175-20

E-Mail kontakt@enervis.de