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As metas dos Planos Nacionais de Energia e Clima Ibéricos



AFRY

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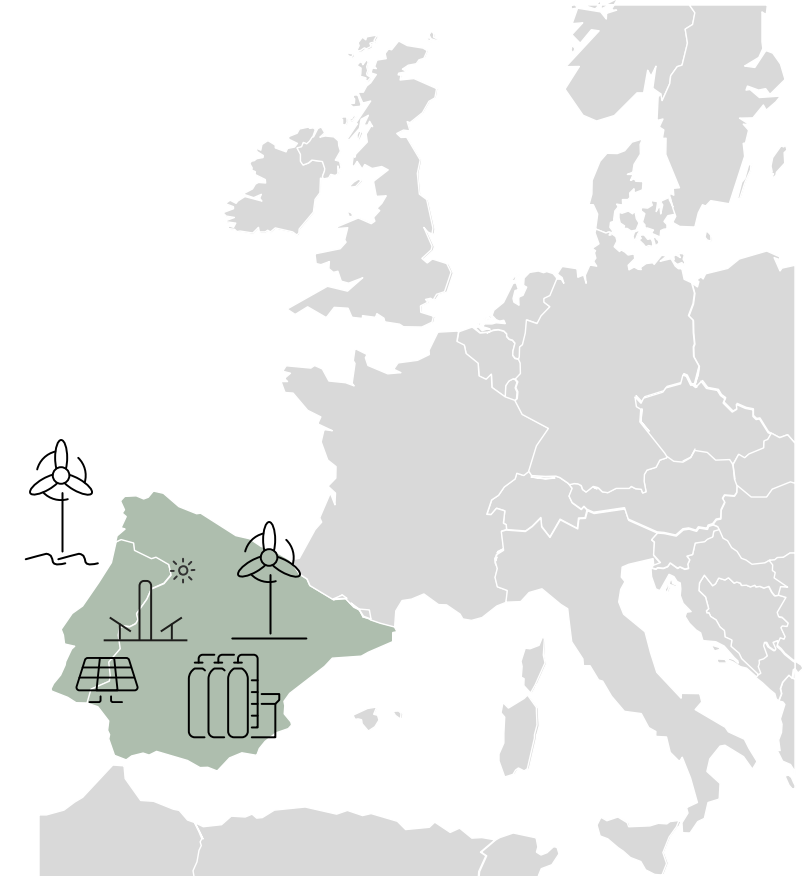
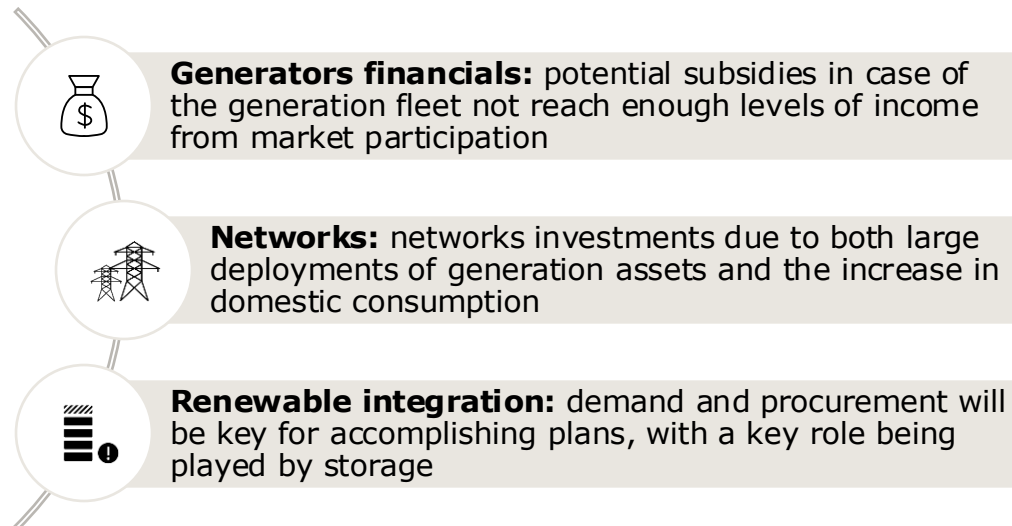
Motivation



INTRODUCTION

Spain and Portugal have announced very ambitious NECPs for 2030, which will require from unprecedented effort and investments

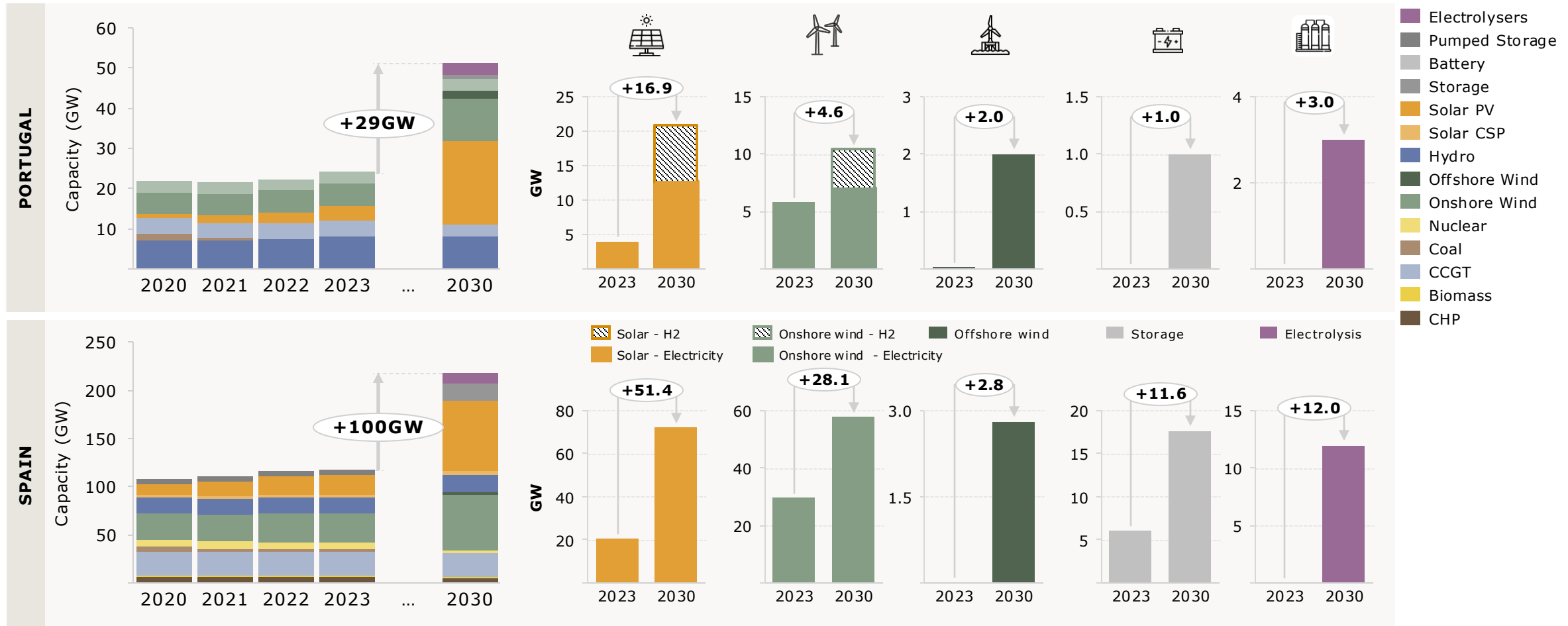
- **Iberian NECP plans released are highly ambitious**, with unprecedented amounts of **renewable capacity to be deployed**, as well as a very relevant **hydrogen and storage infrastructure**
- However, the ambitious plans published, in AFRY's views, are **lacking information on how the two countries will implement those plans**. Without a detailed route and support mechanisms, the plans could be hardly realised through the market itself
- Some topics should be addressed to assure the successful consecution of the plans:





NECP TARGETS

The current Portuguese and Spanish NECPs¹ foresee strong ambitions of renewable, hydrogen and storage deployment to 2030



Note: 1. Portuguese NECP is currently under public consultation

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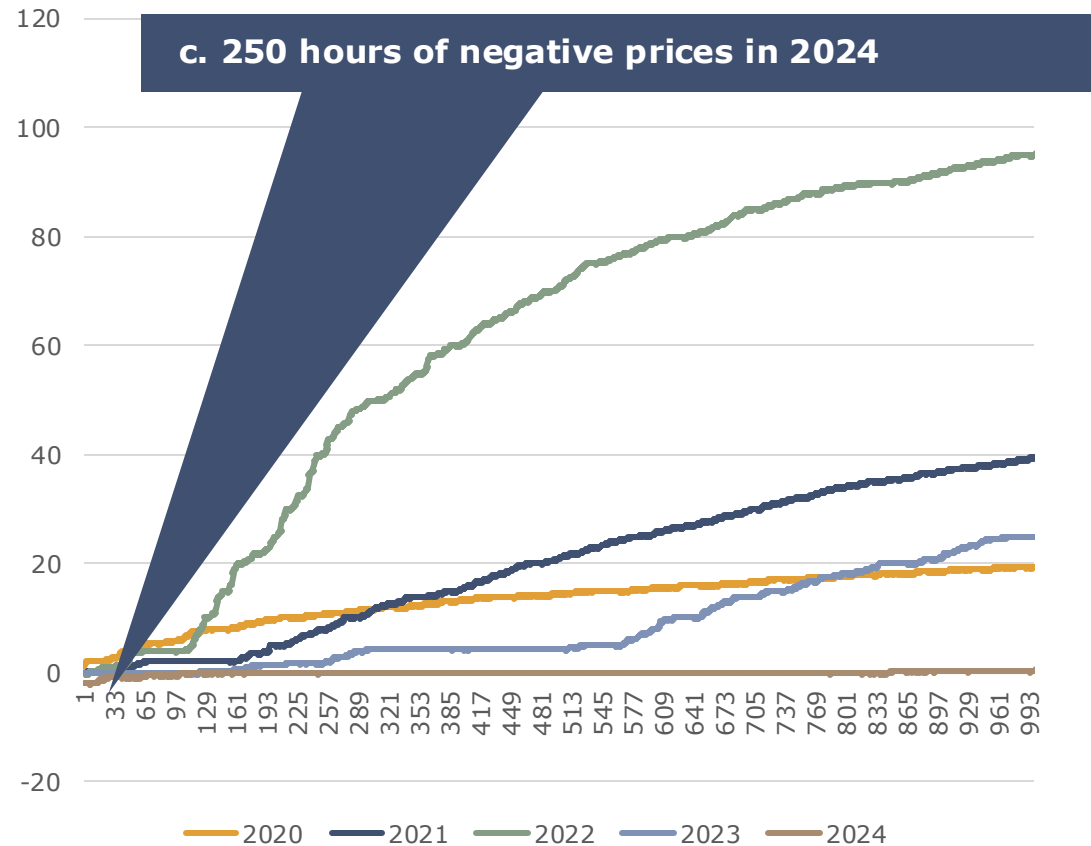
Existing problems



LOW PRICES, CANNIBALISATION AND MARKET CURTAILMENT

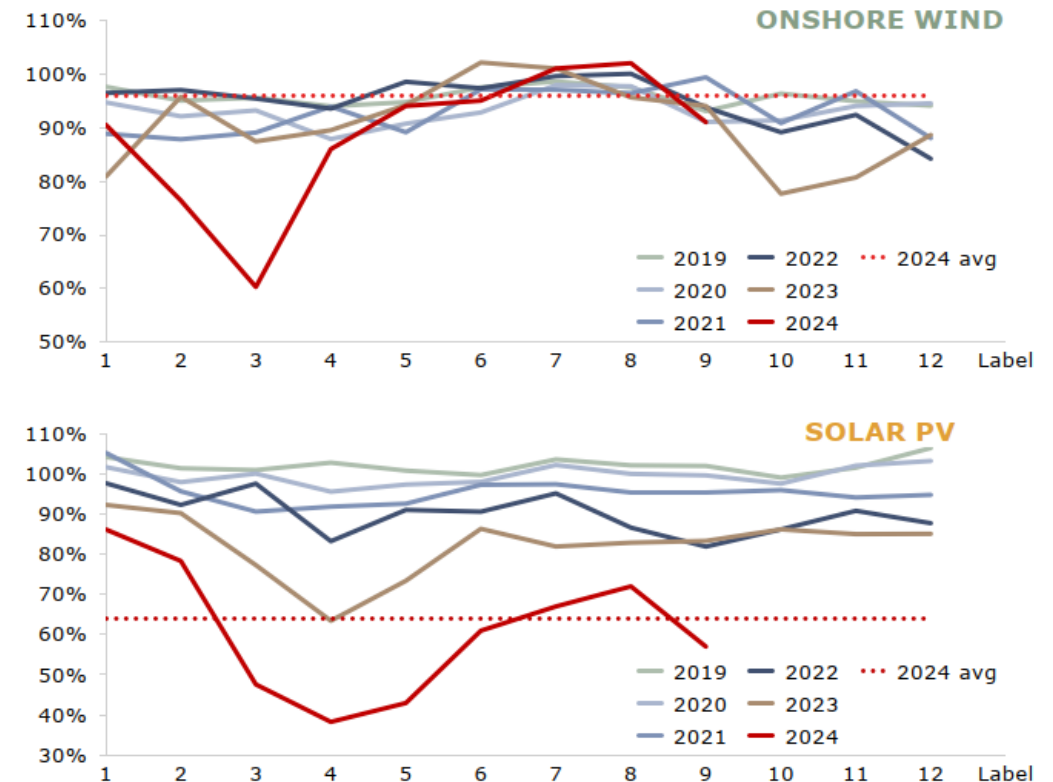
Increasing frequency of low or even negative prices, with a noticeable impact on renewables, especially solar

LOWEST 1,000 PRICES IN SPAIN (€/MWH)



Note: data for 2024 until the 31st of October 2024
Sources: OMIE, REE and AFRY

MONTHLY CAPTURE RATE (%)





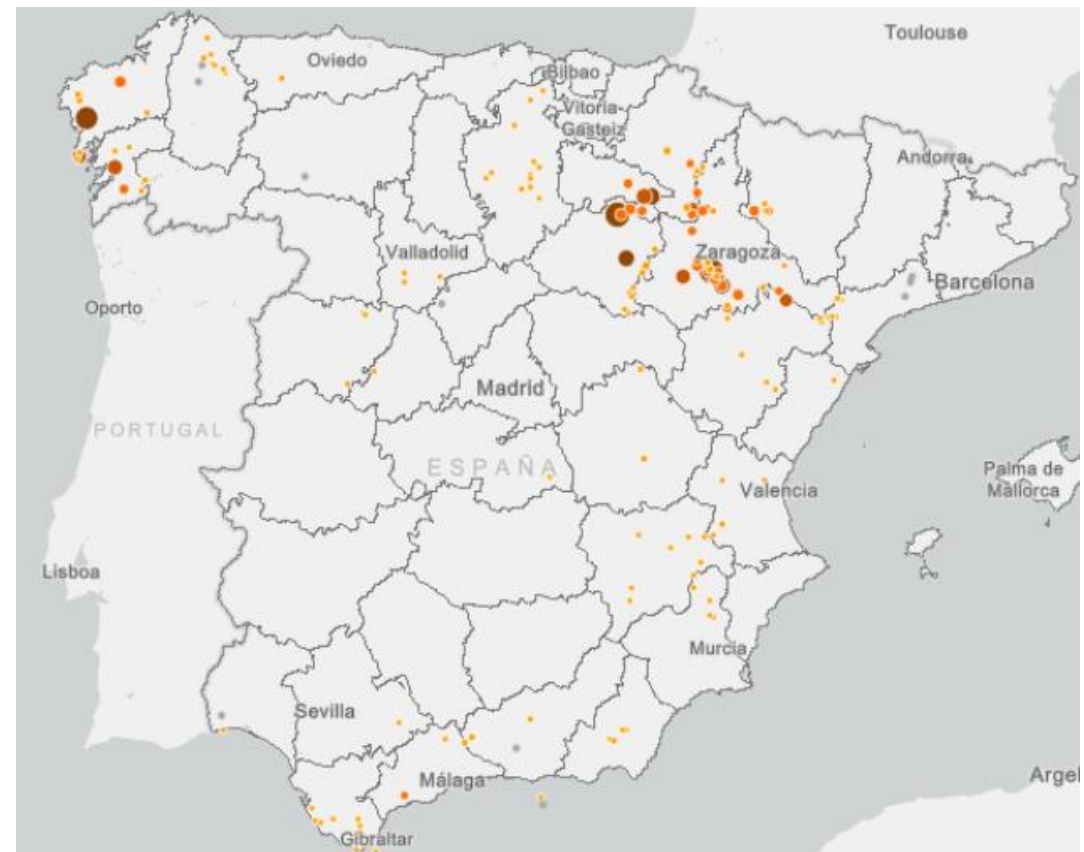
TECHNICAL CURTAILMENT

Onshore wind curtailments have been present mostly in north in the autonomous community of Aragón

ONSHORE WIND PROJECTS CURTAILMENT OVERVIEW IN 2022*



ONSHORE WIND PROJECTS CURTAILMENT OVERVIEW IN 2023*



Note: * these volumes and the ones of the following slides corresponds to the plants identified by AFRY that account the c.40% of the total technical wind restrictions in 2023
Source: AFRY Management Consulting analysis based on REE data

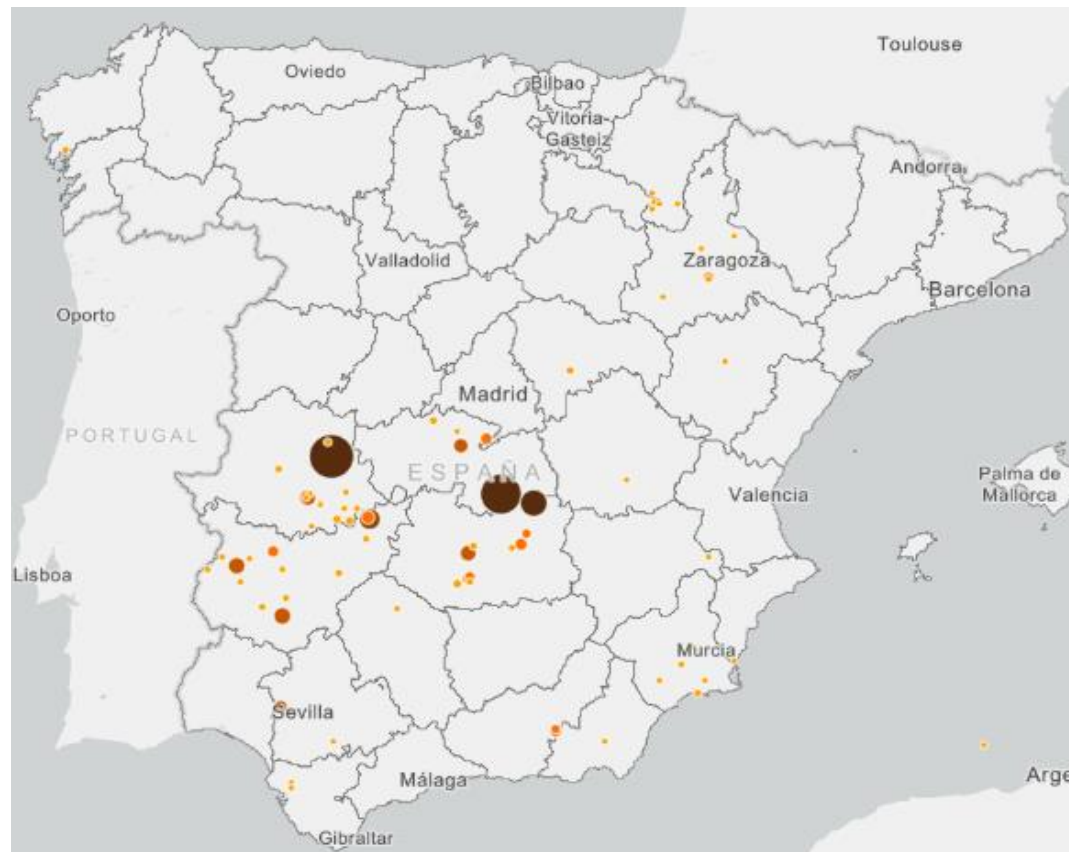


TECHNICAL CURTAILMENT

Solar PV curtailments have been present mostly in south of the country, with special focused on the centre-west of Spain

SOLAR PV PROJECTS CURTAILMENT OVERVIEW IN 2022*

SOLAR PV PROJECTS CURTAILMENT OVERVIEW IN 2023*



Note: * these volumes and the ones of the following slides corresponds to the plants identified by AFRY that account the c.50 % of the total technical solar restrictions in 2023
Source: AFRY Management Consulting analysis based on REE data

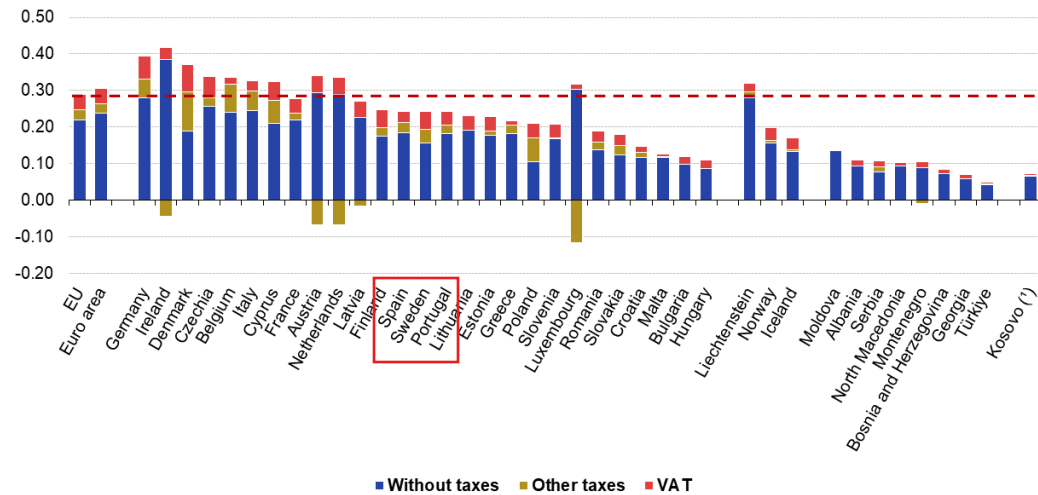


END-USER TARIFFS

Despite the good renewable conditions and favourable fundamentals, Iberia is not amongst the most competitive tariffs for the end users

HOUSEHOLD 2024 TARIFFS

Electricity prices for household consumers, first half 2024 (€ per kWh)

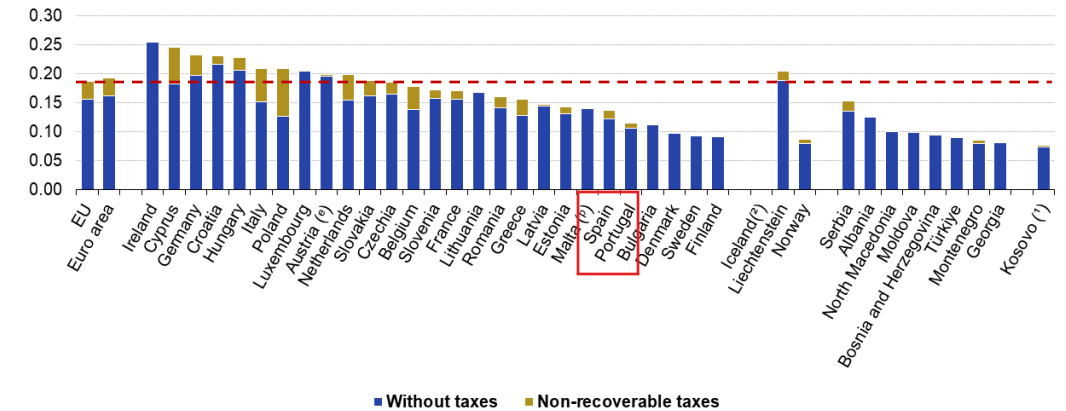


(*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.
Source: Eurostat (online data codes: nrg_pc_204)



NON-HOUSEHOLD 2024 TARIFFS

Electricity prices for non-household consumers, first half 2024 (€ per kWh)



(*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.
(†) Not available
(*) Estimate
(†) Provisional
Source: Eurostat (online data codes: nrg_pc_205)



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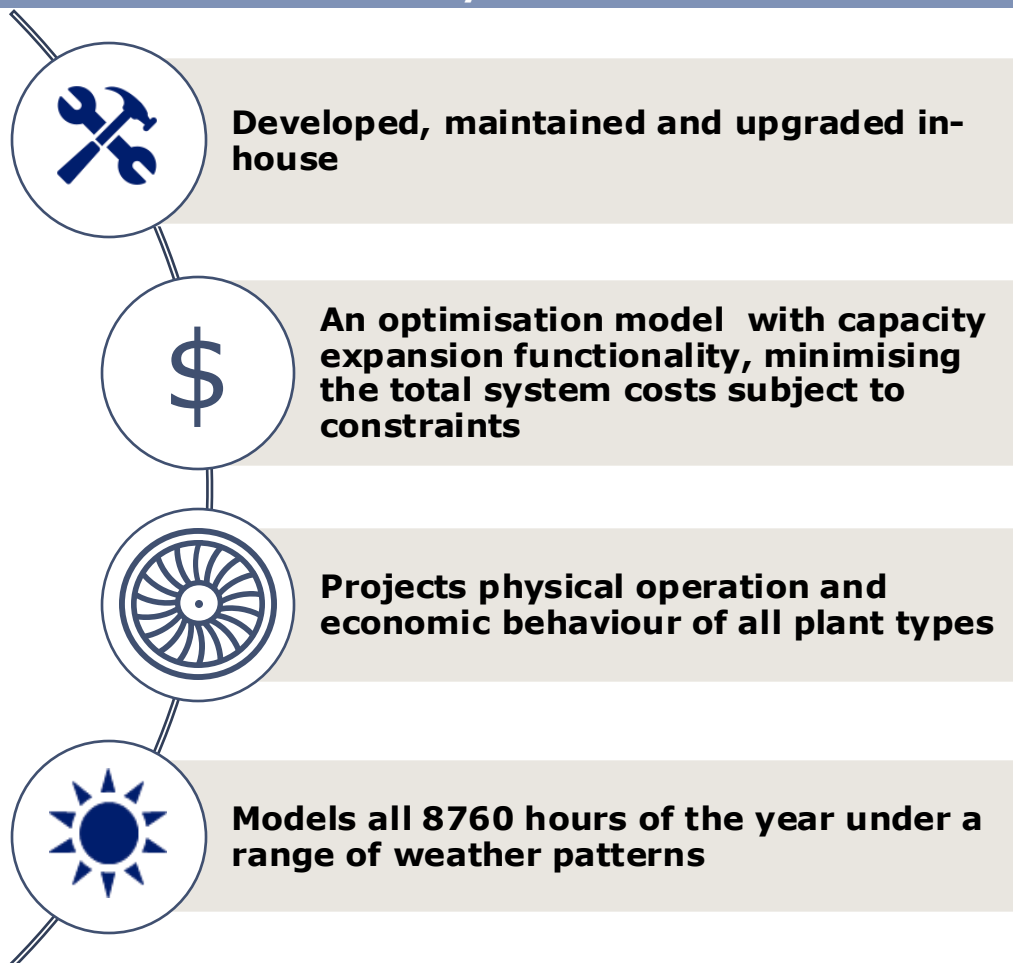
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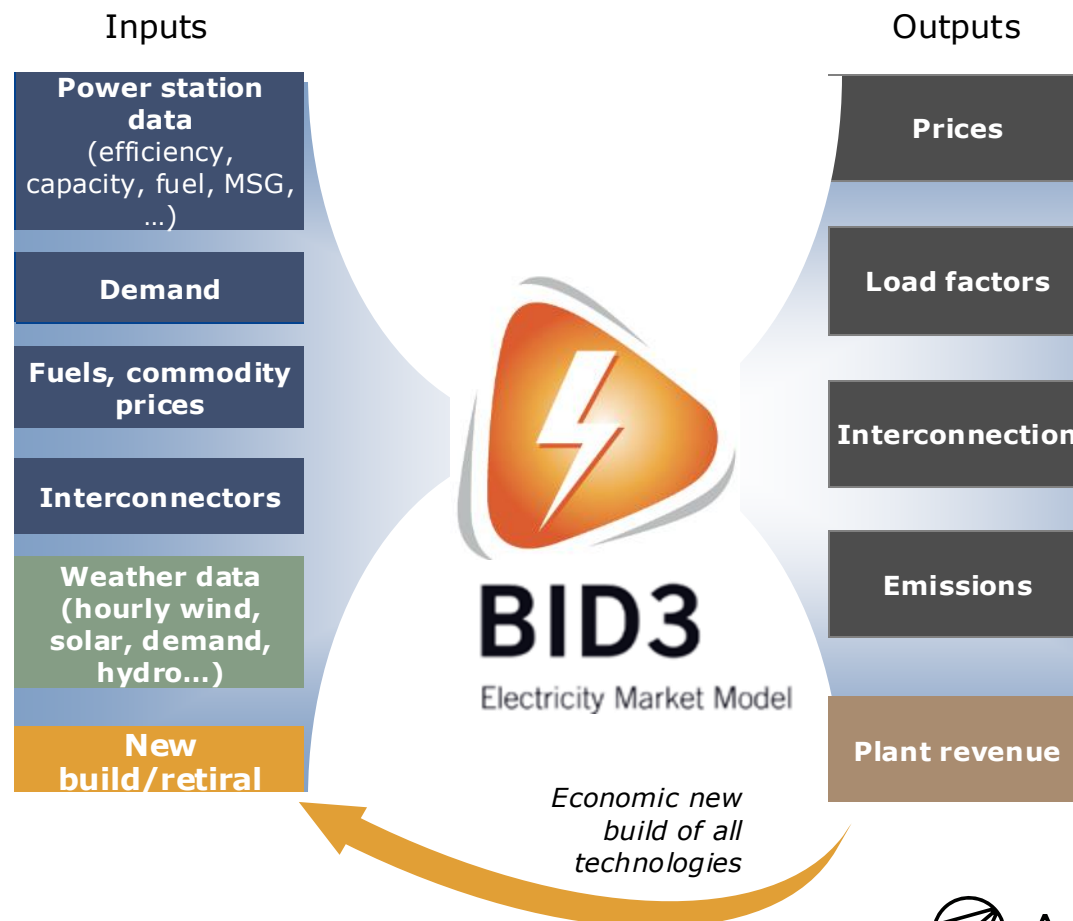
What will happen in the
NECP scenario?

BID3 projects physical operation (generator output, electricity flows, emissions) and economic behaviour (electricity prices, revenues)

Key features



Inputs and outputs of BID3

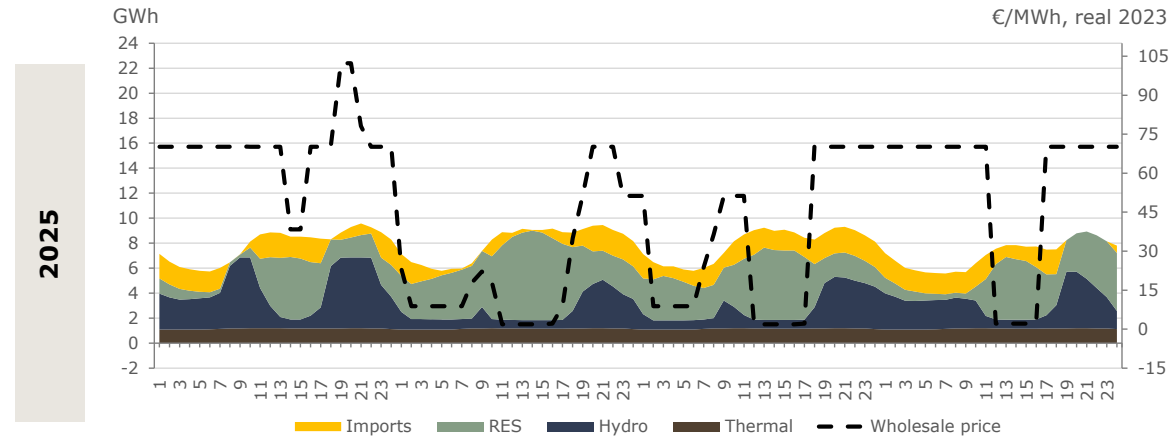




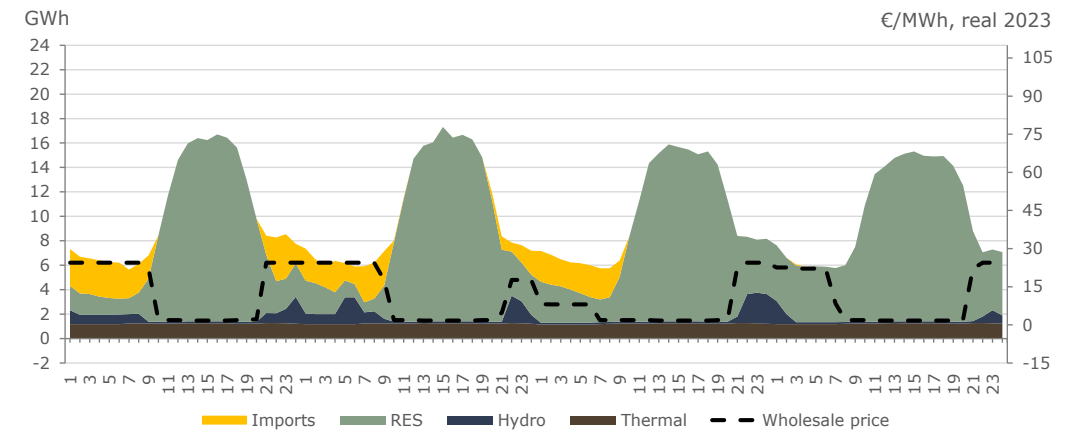
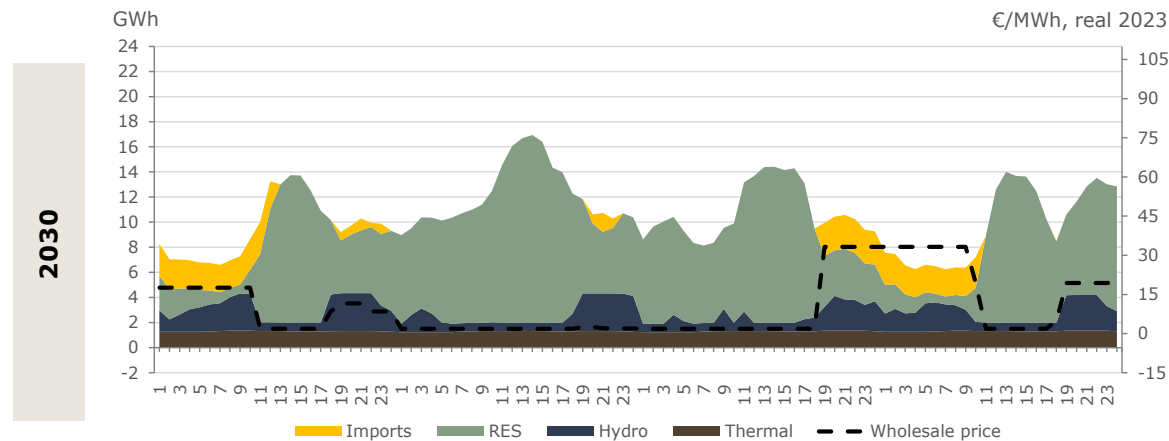
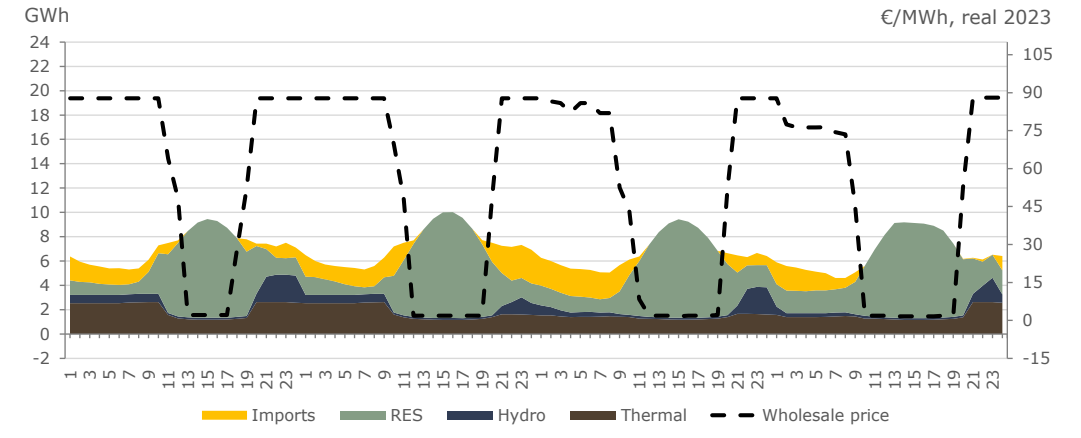
HOURLY SNAPSHOTS

Wholesale prices decrease in the next decade driven by the high development of renewables with many -near zero- hours in 2030

WINTER WEEK



SUMMER WEEK



Notes: Winter week corresponds to January 14th to 17th, summer week corresponds to July 2nd to 5th. Results are provided for 2015 case collection. Thermal technologies include for CHP, biomass or CCGT. RES technologies include solar, onshore and offshore wind.

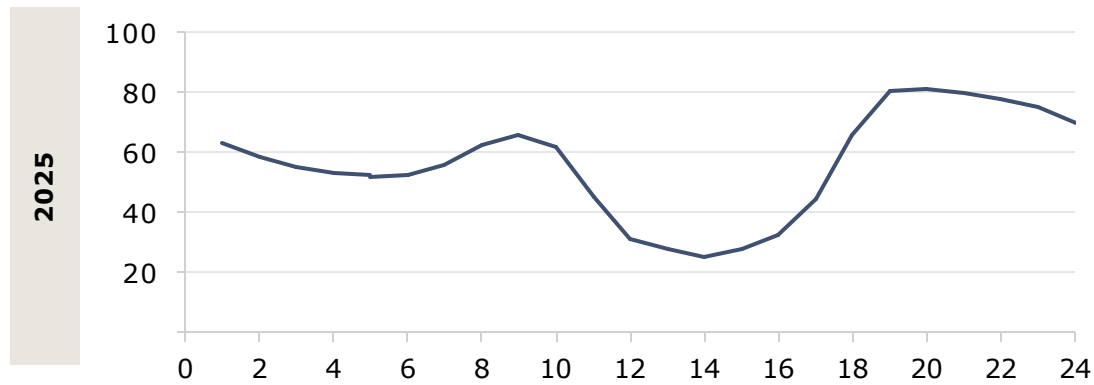


HOURLY PRICES

During the summer, wholesale prices during the sunny hours reach near zero values as solar PV production covers most of the demand

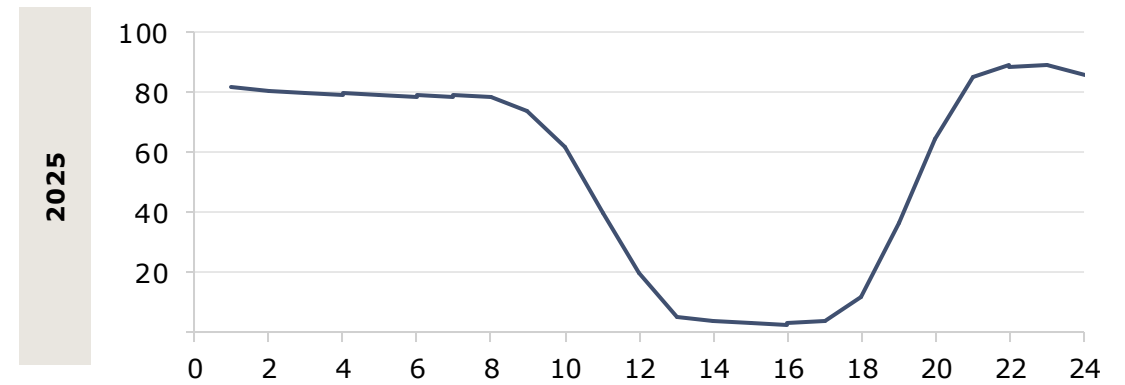
AVERAGE WINTER HOURLY PRICE

€/MWh, real 2023

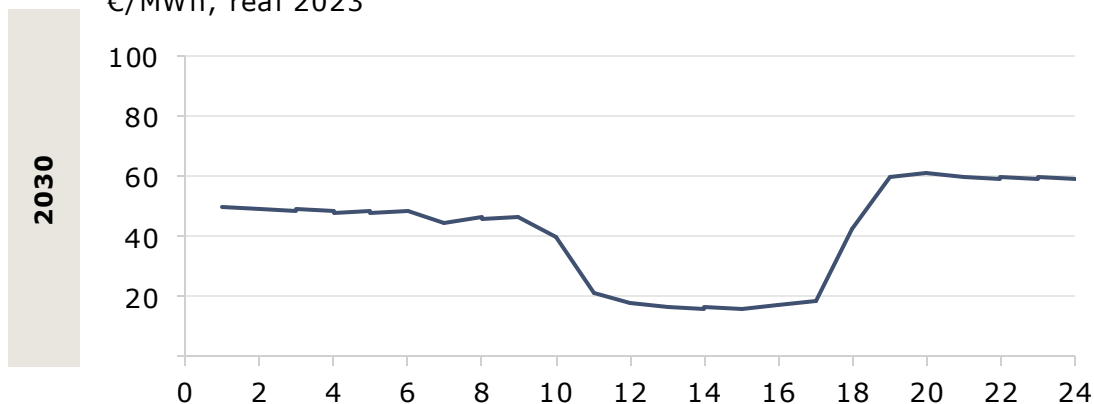


AVERAGE SUMMER HOURLY PRICE

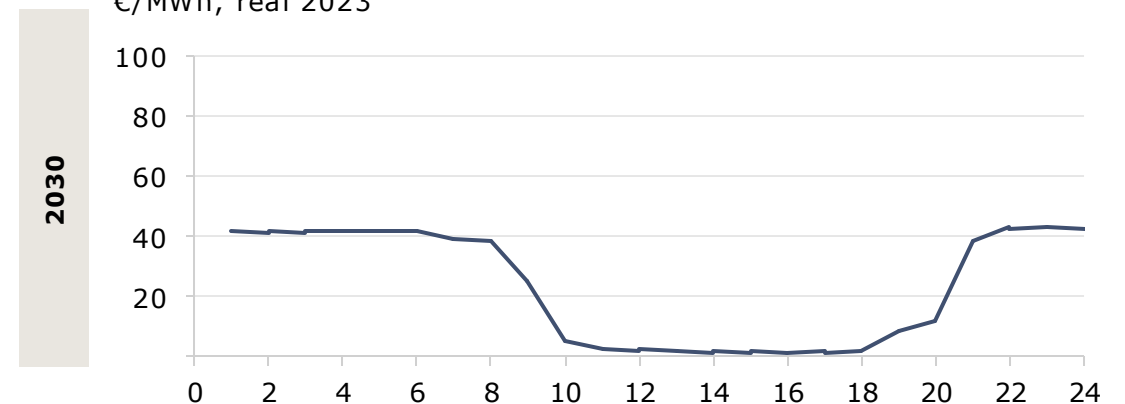
€/MWh, real 2023



€/MWh, real 2023



€/MWh, real 2023

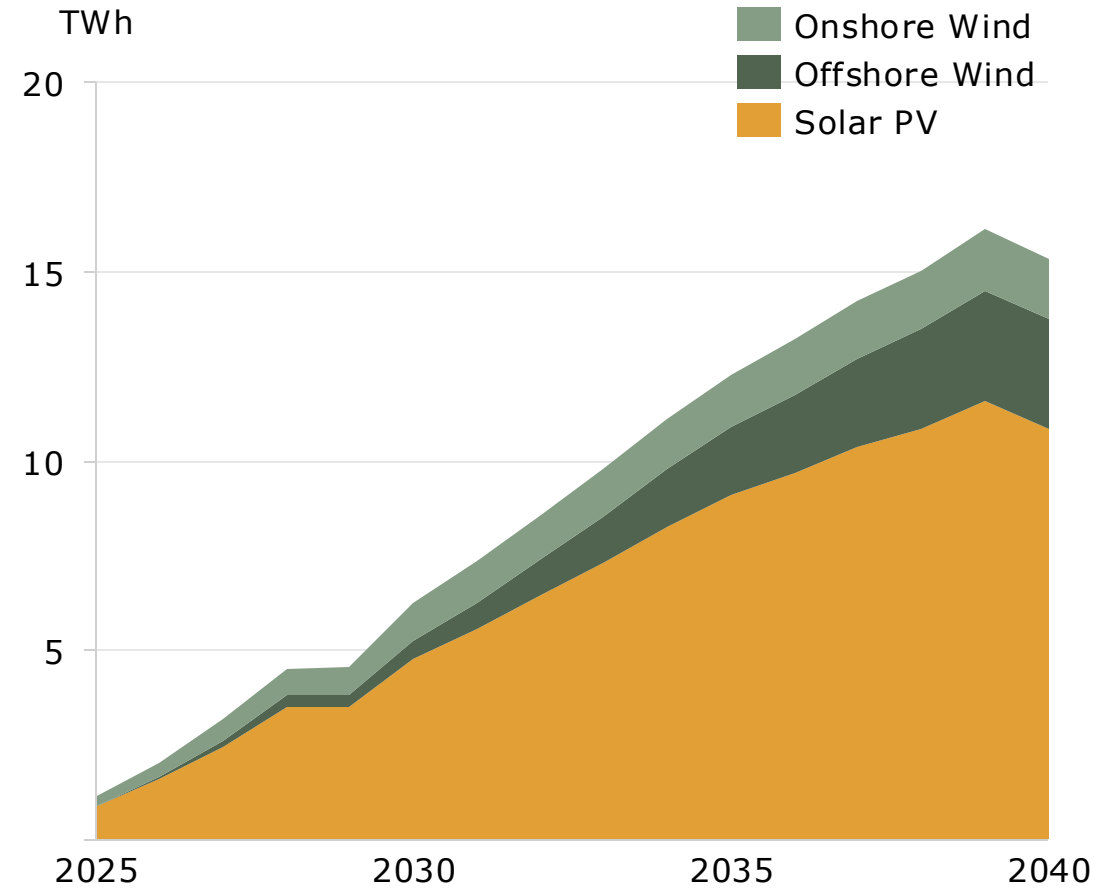
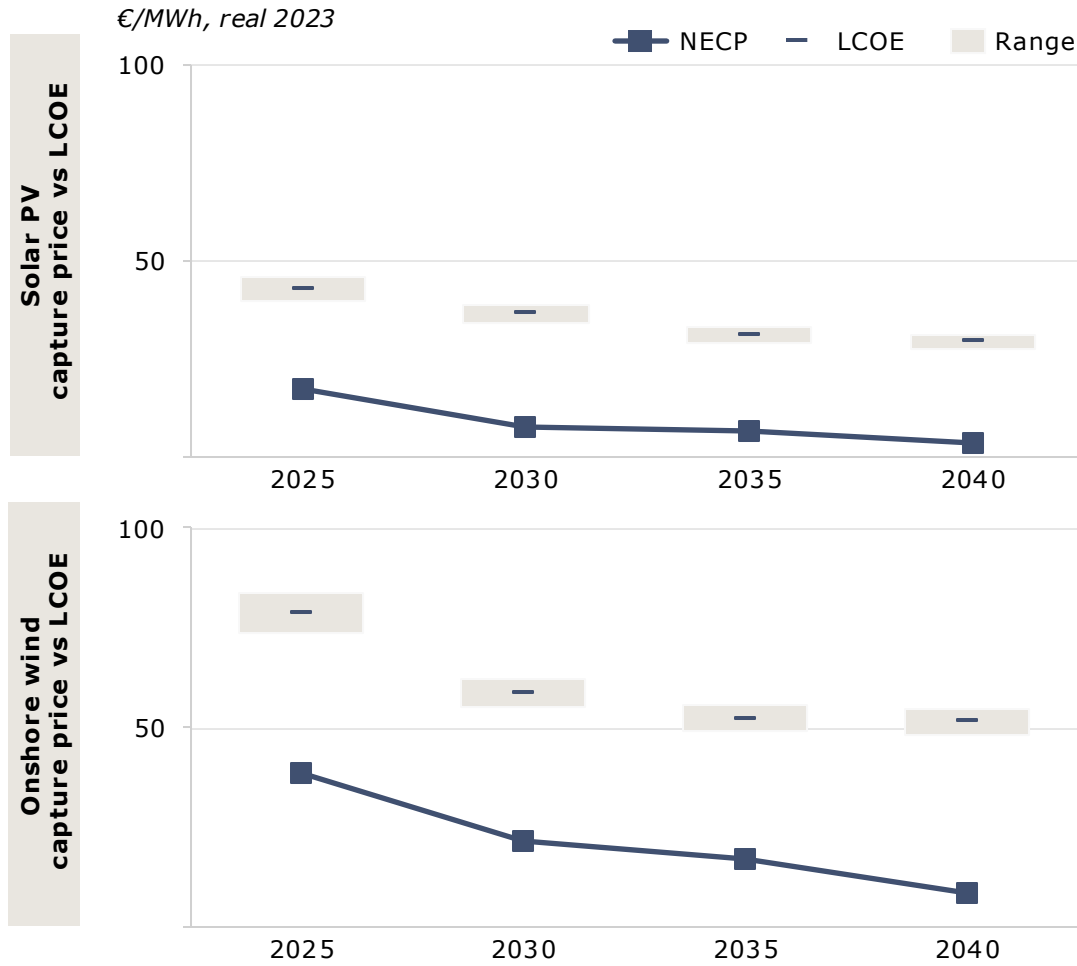


Notes: Winter corresponds to January; summer corresponds to July.



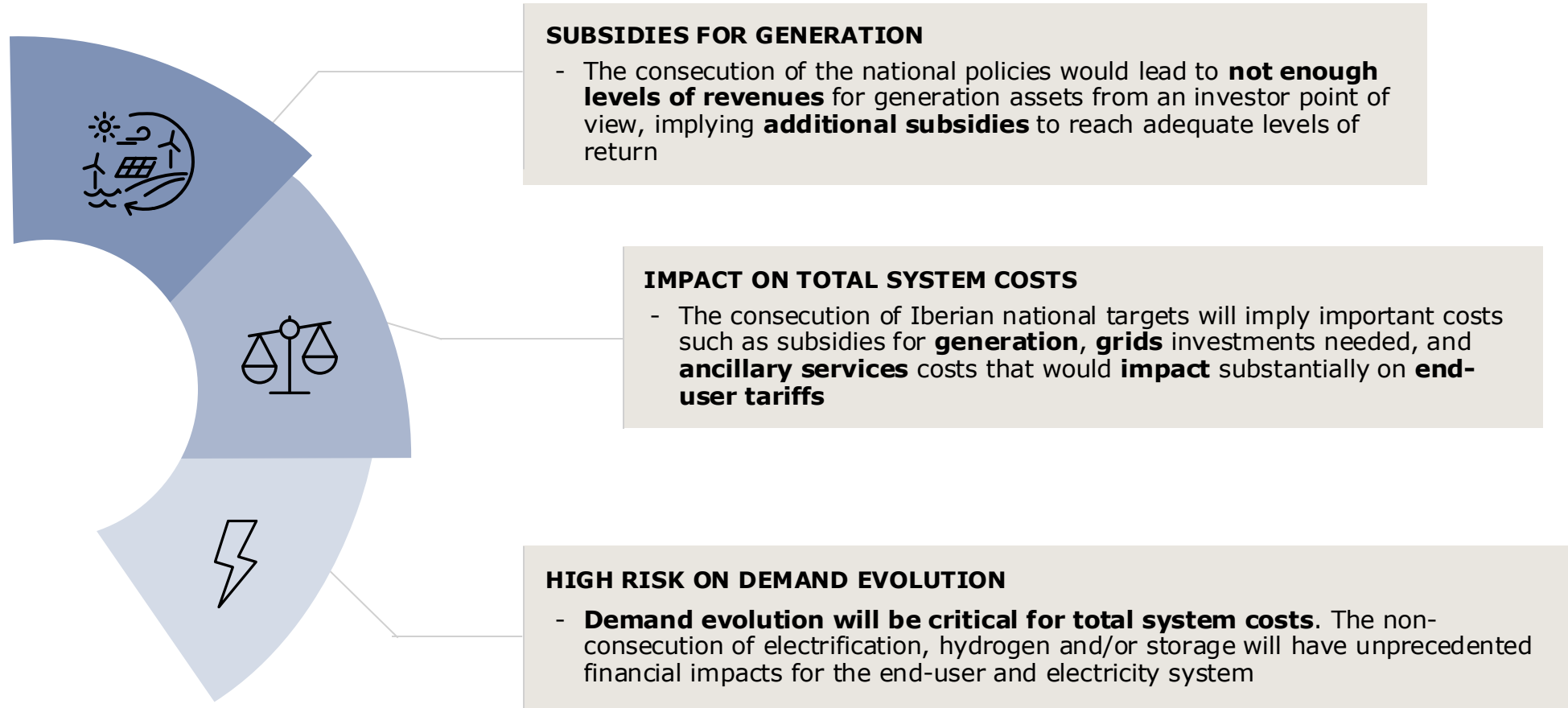
CAPTURE PRICES AND CURTAILMENTS

Renewable capture prices well below LCOEs, with increasing amounts of curtailments regardless of the increasing electricity demand



CONCLUSIONS

The consecution of Iberian energy policies would require important levels of additional subsidies for generation impacting end-user tariffs





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