Study:
Quantitative assessment of a common threshold for publishing outage information

Executive Summary

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Outline of the study

Quantitative assessment of a common threshold

Background

- REMIT requires publication of inside information which is, among others, information which "[…] would be likely to significantly affect the prices of wholesale energy products" (Article 2(1) of REMIT).

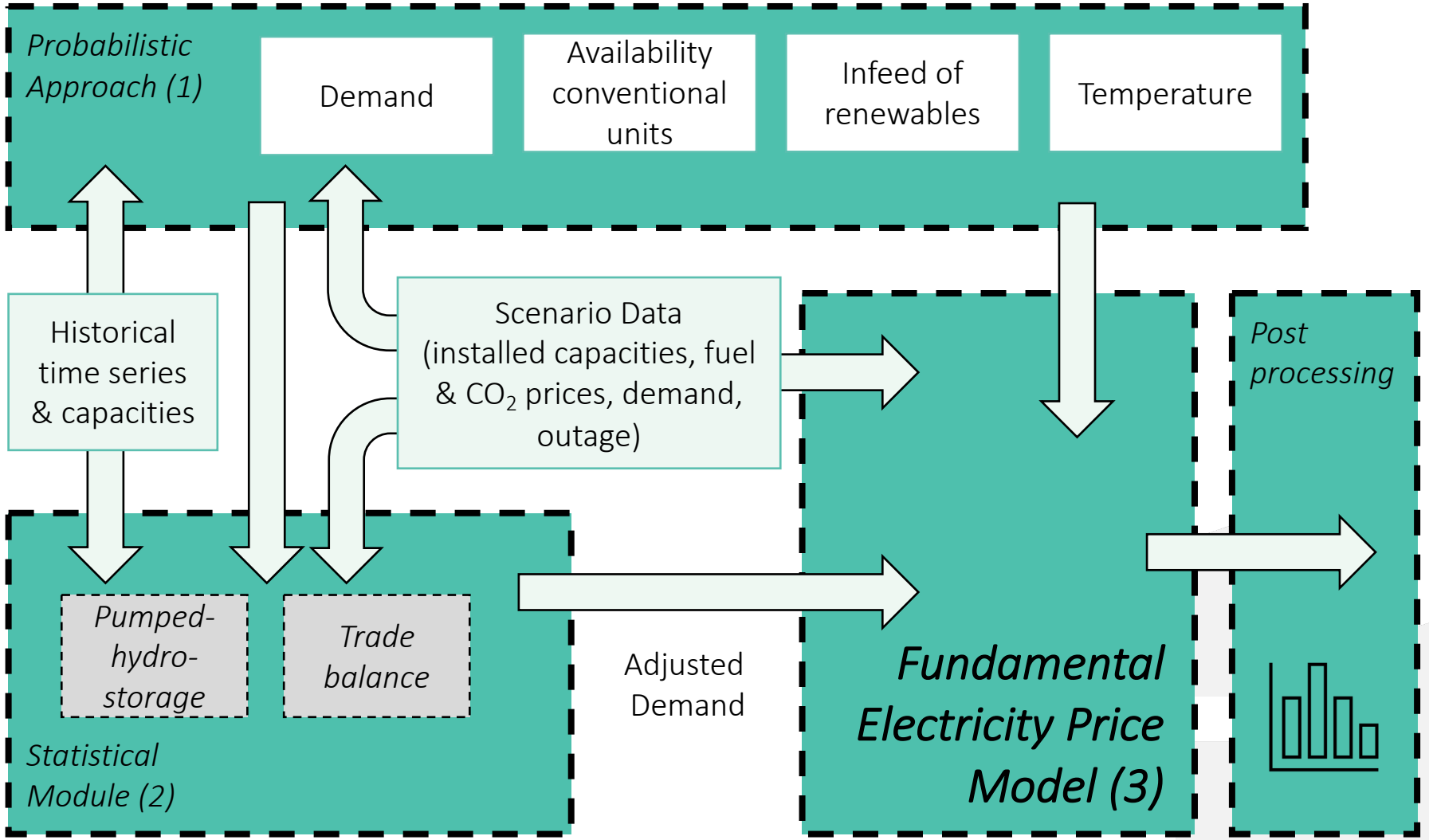
Main objective

- evaluate whether 100 MW is a robust threshold for REMIT relevance using a comprehensive, coherent and comprehensible methodology
- Enabling uniform and automatic application above which the price effect of an outage has to be deemed "significant" (publication requirements)

Methodology – Overview

Evaluating the price effects of 100MW capacity outages

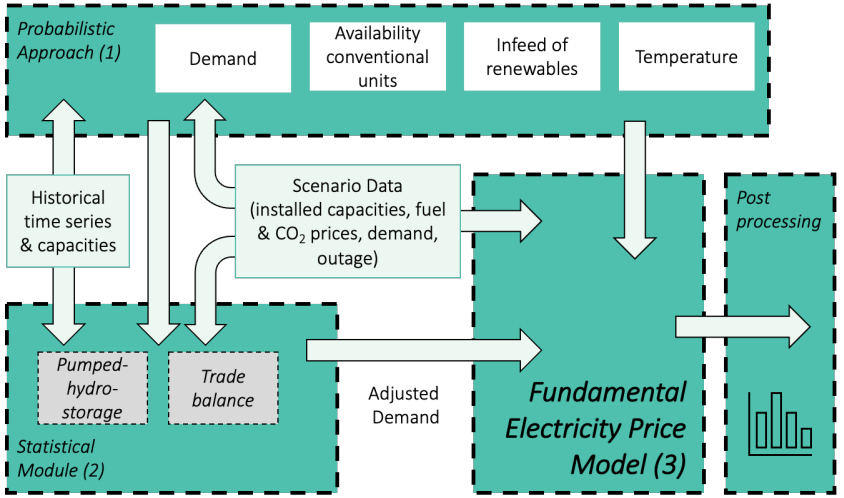
- Probabilistic variation of relevant time series (1)
- Statistical modelling of storage and cross-border flows (2)
- Price simulation using a fundamental electricity price model (3)



Methodology – Details

Evaluating the price effects of 100MW capacity outages

- The probability of price effects exceeding 5% of the base price is analyzed
- Enhanced supply stack model (merit order) – including effects of CHP and other must-run – to determine electricity prices
- Probabilistic approach based on observations from 5 years of hourly data for demand, renewables and availabilities
- Statistical module to consider the smoothing effects of storage and transnational trade
- Large number of simulations (almost 9 million hourly realizations) to assess the price effects of outages
- Post processing to determine the probability of significant price effects



Installed capacities and annual demand

Scenario Data and Assumptions

- Scenarios in line with MAF 2020
  - Target years: 2022, 2025 and outlook to 2030
  - Additional variation of CO_2 prices for 2025 and 2030
- Data sources:
  - Capacities: MAF and power plant database of the German regulator (BNetzA)
  - Fuel / CO_2 prices: BNetzA scenarios, future market price notations (Q4 2021) and own assumptions
- Main Input

	2022	2025	2030
Installed capacities conventional [GW]	71.6	60.7	54.4
Installed capacities renewables [GW]	138.8	166.4	204.2
Net electricity consumption [TWh]	527	542	561
CO_2 prices [€/MWh]	69	62 / 82	100 / 140

Sources:
https://www.entsoe.eu/outlooks/midterm/
https://www.netzausbau.de/SharedDocs/Downloads/DE/2035/SR/Szenariorahmen_2035_Genehmigung.pdf?__blob=publicationFile
https://www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/Versorgungssicherheit/Erzeugungskapazitaeten/Kraftwerksliste/start.html

Probability of significant price effects for a 100 MW outage

Key Results

- Probabilities of significant price changes (exceeding 5% of yearly base prices) for outages of 100 MW given in the table
- Small differences between low (l) and high (h) CO_2 price
- Probability of significant price effects below 0.8% for all scenarios and technology classes

	2022	2025_l	2025_h	2030_l	2030_h
Nuclear	0.28%				
Lignite	0.28%	0.61%	0.68%	0.73%	0.61%
Hard Coal	0.18%	0.61%	0.67%	0.72%	0.58%
CCGT	0.16%	0.61%	0.68%	0.73%	0.61%
OCGT	0.00%	0.51%	0.58%	0.62%	0.50%
Wind Offshore	0.18%	0.31%	0.31%	0.36%	0.30%
Wind Onshore	0.16%	0.13%	0.13%	0.15%	0.15%
Solar	0.06%	0.06%	0.06%	0.07%	0.07%

Conclusion of the study
Study on the quantitative assessment of a common threshold

- The applied methodology enables detailed analyses of price effects considering multiple uncertainties.
- For a 100 MW outage, the probability of significant price effects is below 1% for all scenarios and technology classes.
- Results underline that the use of a 100 MW threshold is a robust approach to simplify the application of the REMIT criteria.
- The adoption of such a threshold, proposed also by other institutions, is likely to increase consistency and reliability for market participants.
- At the same time, it ensures that major events impacting the price formation on the electricity markets are still adequately reported.

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Services

- Provision of scientific models, methods and selected data for the energy industry via cloud services (direct use by customers)
- Individual services & solutions
- Consulting services

Background

- Founded mid 2021
- Spin-off from the Chair of Energy Economics (University of Duisburg-Essen)

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