

g-advisory
GRUPO GARRIGUES



2022-Q4 MIBEL pool prices outlook and market services

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Contents

- Why G-advisory – Simulyde?
- 2022-Q4 Regulatory highlights - Brief
- 2022-Q4 Market review
- Model  xPryce!
- Products and contacts
- Results and products overview

Why G-advisory – Simulyde?

g-advisory
GRUPO GARRIGUES

www.g-advisory.com

- ▶ **G-advisory + Garrigues.** Integrated approach combining technical and legal aspects.
- ▶ **Multidisciplinary team.** Industrial Ing., Civil Ing., Mining Ing., Forestry Ing., Chemical Ing, etc.
- ▶ **+ 20 years experience in Energy and ESG.** Supporting our clients in energy transition, sustainability and climate change.
- ▶ **+ 40 countries experience in 5 continents.** Offices in México City, Santiago de Chile, Paris and Madrid.
- ▶ **+ 40 GW of renewable capacity analysed.** Experience in all commercial technologies and innovative projects.
- ▶ **+ 5 years providing advice on electrical market.** MIBEL market outlook and pool price projections.

 **SIMULYDE**
INVESYDE

www.simulyde.com

- ▶ **Invesyde group.** Consultancy and IT services firm.
- ▶ **+ 15 years experience.** Assisting our clients to reach their goals in the energy sector.
- ▶ **+ 5 countries modelled.** Spain, Portugal, France, Italy and UK.
- ▶ **+ 6 major energy agents use our models.** Price model (xPryce) used for price and revenue projection, and ad-hoc models for any energy aspect.
- ▶ **+ 7 years modelling MIBEL.** Price projections, market and regulatory reports.

360° visión of the Spanish electricity sector



In depth knowledge of renewable technologies and market modelling



Comprehensive technical, economic, strategic, environmental and market advisory services.

Technical analysis, pool price projections, PPA, EPC and O&M contracts analysis, hybridisation assessment, storage solution analysis, cost-benefit analysis of own consumption projects, project environmental assessment, etc.

2022-Q4 Regulatory highlights - Brief

01 Regulation (EU) 2022/1854 of the Council

- Measures aimed at emergency intervention in European energy markets to respond to price rises through time-limited measures.
- Reducing monthly gross electricity consumption by 10% (in addition to at least 5% during peak price hours), cap on revenues for electricity generators finally set at 180 EUR/MWh, temporary solidarity contribution (to be levied on windfall profits) and the possibility to set regulated prices below cost, including for small and medium-sized companies.

02 Plan (+SE) to provide more security

- Plan to increase security of supply, with three key objectives: increasing protection for vulnerable consumers, households and businesses; reinforcing strategic and energy autonomy, implementing additional measures to accelerate the structural changes already underway; solidarity with other EU Member States.

03 Royal Decree-Law 18/2022

- Adopts 18 of the 73 measures of the “Plan +SE”, which are mainly aimed at protecting gas and electricity consumers.
- Renewable gases are also promoted, granting public utility for the purposes of compulsory expropriation of those direct connection lines for a renewable gas production plant.
- Community of neighbours will be allowed to benefit from TUR tariff.
- Reduction of excess remuneration (windfall profits) due to high gas prices, is extended until December 31, 2023.

04 Royal Decree-Law 20/2022

- Extension until December 31, 2023 of VAT at 5% on electricity and natural gas supply, the Special Tax on Electricity at 0.5% and the suspension of the IVPEE. Also, 80% reduction in the cost of access tolls for the electricity-intensive industry is extended until June 30, 2023.
- Finally self-consumption distance between generation and consumption is set to 2,000 m.

05 Renewable auctions

- At the third SREER, 520 MW were auctioned, of which only 31 MW of local PV (44.98 to 62.5 EUR/MWh) and 146 MW of biomass (72.38 to 108.19 EUR/MWh) were awarded. CSP, not awarded
- At the fourth SREER, 1800 MW of solar and 1500 MW of wind were auctioned and just 45,5 MW wind were awarded.

06 Gas price cap

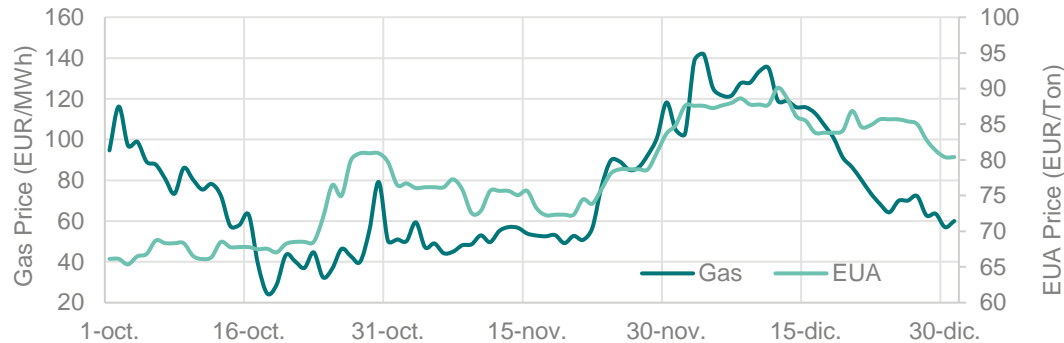
- European Union energy ministers finally agreed a natural gas price cap, after weeks of talks. The market correction mechanism will apply as of February 15, and it will be automatically activated if month-ahead price on the TTF exceeds 180 EUR/MWh for three working days and it is 35 EUR/MWh higher than a reference price for LNG on global markets for the same three working days.
- By November 1, 2023, the Commission will carry out a review and may propose to extend the mechanism validity.



Further regulatory and market highlights included in our Quarterly subscription to MIBEL pool price projection. Click [here](#) to contact for further information.

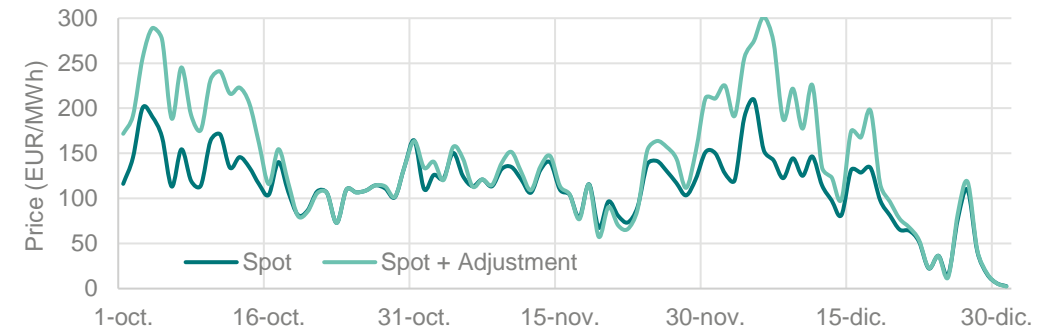
2022-Q4 Market review

Fundamentals (Gas, EUAs)



- Natural gas prices have fallen in Q4, considering that natural gas stocks remain higher than usual and LNG imports are at high levels.
- Good wind generation and abundant rainfall in this Q4.
- Q4 closed with an average of 75.21 EUR/MWh, 62.98 EUR/MWh below Q3. Forward MIBGAS products indicate high prices but lower than expected in Q3: 2023-Q1 at 79.8 EUR/MWh and Yr-2023 decreases at 79.42 EUR/MWh.
- CO2 prices have ranged between 65 EUR/Ton and 90 EUR/Ton, with an average of 77.30 EUR/Ton.

Spot-Market price



- 2022-Q4 price remained high following the gas price trend, but 33.05 EUR/MWh lower than in Q3. In October and November prices remained low due to mild temperatures. In December, with the arrival of the first cold snap, prices went up, but once the temperature calmed down, they fell again.
- Q4 average price was 113.21 EUR/MWh, and the adjustment mechanism was 27.90 EUR/MWh. Regarding futures, 2023-Q1 stands at 146.8 EUR/MWh and Yr-23 at 183 EUR/MWh.
- In Spain and Portugal, spot prices remained much lower than in the rest of Europe due to the gas adjustment mechanism and the reduced dependency on Russian pipeline gas.
- During 2022-Q4, wind-generated 26.4%, CCGT produced 24.5%, and nuclear 20.4%.

Model



xPrice model key features

The xPryce model, used to simulate the MIBEL electricity market in the analysis for this report, was developed by **Simulyde**.

- **Fundamental Model**, simulating the hourly operation of the electricity system, optimizing timing decisions taken by market agents and representing in detail both generation and demand.
- **Model output, pool hourly price projections** for all the simulated years in the base scenario (the “Base Scenario”) and in all the alternative scenarios; **hourly generation and capture prices for every technology**.
- **Modelling of France included**, due to its paramount importance in MIBEL price formation.
- **Optimization of the operations of plants involved in the market**, in order to simulate the pool dispatch, thermal, renewable and hydro units are represented using all their technical and economic characteristics.
- **Hourly thermal and hydroelectric programming**, for a yearly time horizon.

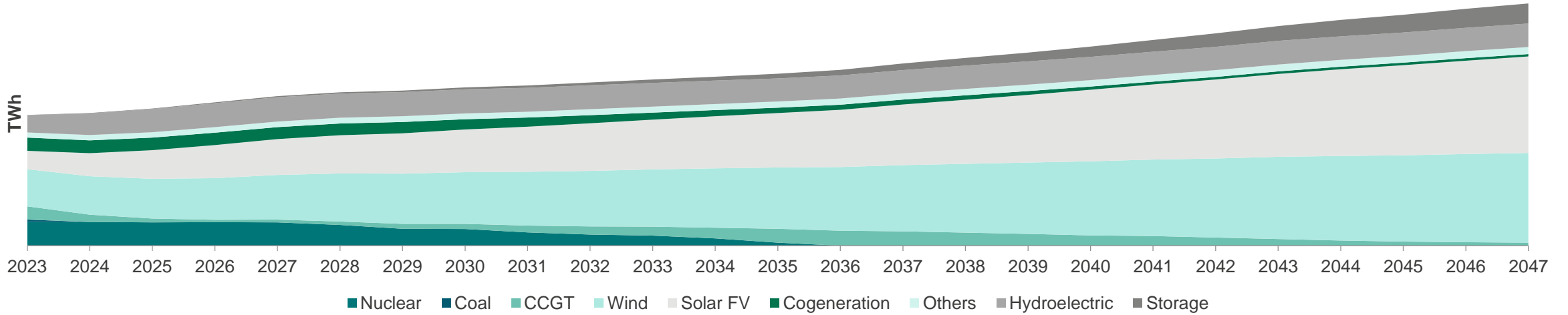
Fundamental models strengths

- **Fundamental models** are able to simulate the market clearing by considering the operation of the market, physical features of the power system, regulatory effects, etc.
- For **long-term horizons**, punctual events that have not occurred in the past and that are bound to happen in the future can be simulated, such as nuclear power plant decommissioning or the establishment of new interconnections between market areas.
- Given **that statistical models** operate under the assumption that **history will be repeated** in the future, fundamental models can be considered more flexible tools with accurate long term results.

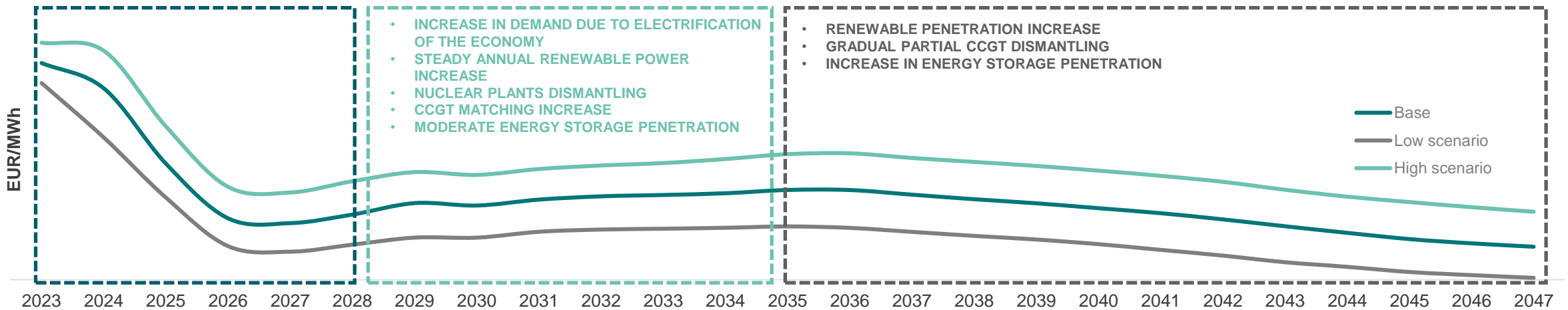
| | Fundamental models | Statistical models | Examples |
|--------------------|--------------------|--------------------|--|
| Structural changes | ✓ | ✗ | Regulatory changes (taxes, subsidies, windfall profits, etc) |
| New market events | ✓ | ✗ | Nuclear/coal/CCGTs plants decomissioning path modification, external events (interconnections) |
| Market clearing | ✓ | — | Falling prices with the increase in renewable generation |

Results overview

Generation projection



Pool Price projection



- INCREASE IN DEMAND DUE TO ELECTRIFICATION OF THE ECONOMY
- STEADY ANNUAL RENEWABLE POWER INCREASE
- NUCLEAR PLANTS DISMANTLING
- CCGT MATCHING INCREASE
- MODERATE ENERGY STORAGE PENETRATION

- RENEWABLE PENETRATION INCREASE
- GRADUAL PARTIAL CCGT DISMANTLING
- INCREASE IN ENERGY STORAGE PENETRATION

- REDUCTION IN DEMAND DUE TO HIGH COMMODITY PRICES AND GOVERNMENT MEASURES
- RAPID RENEWABLE PENETRATION
- COAL PLANTS DISMANTLING
- DECLINE IN NATURAL GAS PRICES

Products and contacts

Report

A Complete MIBEL market outlook and pool price projection

B Quarterly subscription to MIBEL pool price projection

C Specific analysis for innovative projects

- Hybridization, Self-consumption, Batteries, Hydrogen

Content

- 01** Spanish Electricity System Overview
 - Demand, Generation, Transmission, Distribution and Retail activity
- 02** MIBEL Electricity Market
 - Market operation review, historical market pool prices, futures
- 03** 25 years MIBEL pool price projection
 - Base, Low and High Scenarios. Elaboration of other alternative scenarios
- 04** 25 years MIBEL Energy mix and production projection
 - Base, Low, High Scenario and other alternative scenarios.
- 05** 25 years capture price projection
 - Technologies capture prices
 - Specific asset capture price estimation
 - Capture ratios
- 06** Quarterly Market and Regulatory highlights review

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