



PORTUGUESE ELECTRICITY MARKET REPORT – SOLAR PV

Portuguese wholesale price and PV Capture Price projections (2020 – 2050)

Over the summer, the Portuguese Government successfully organized one of the largest PV auctions worldwide. Participants within the auction were given the choice between a Guaranteed income scheme (similar to a FiT) and a General scheme (merchant) having committed to make a system payment. The auction winners committed to develop 1.15 GW of PV at some of the cheapest prices ever recorded, in certain cases below €15/MWh. Our report will analyze the impact of the results of this auction, provide our view on the current and future regulatory framework and provide our wholesale and PV capture price analysis out to 2050. Our report provides a one-stop-shop for investors looking to understand the risks / opportunities of investing in operating or developing Solar PV assets in Portugal.

In this report, EKON Strategy Consulting provides its independent price forecasts (wholesale price and PV capture price forecasts under three scenarios, as well as our expert opinion on the Portuguese energy market (regulatory and market risk analysis) and its likely future development.

This report has been prepared by a coordinated team of experts based in Madrid, with real on-the-ground knowledge of the Portuguese Solar PV market.

Our bankable reports and price projections have been used by leading Utilities, Infrastructure Funds, Lenders and Independent Promoters in investment decision processes, negotiating debt or re-financing as well as in commercial and investor/state arbitrations.

Key Report take-aways

- Portuguese pool price / PV Capture price, 3 scenarios,
- Analysis of key drivers (Market /Regulatory),
- Regulatory and Market risk analysis (economic as well as the energy sector indicators),
- Risk analysis by asset type: operational, developing (auction / merchant),
- 130-page report + .xls spreadsheets and workshops.

Regulatory to market risk transition

In January 2019, the Portuguese Government published its draft National Energy and Climate Plan (NECP) within which it has set extremely ambitious renewable growth targets by 2030. PV is expected to increase by over 8GW wind by over 4 GW and hydro by over 1.8 GW.

One of the most attractive renewable markets is open for business, but investors must proceed with caution.

The last 10 years have seen the Portuguese Solar PV industry transition from a scenario of full exposure to regulatory risk (receiving 100% regulated revenues), to one of a blend of regulatory and market risk.

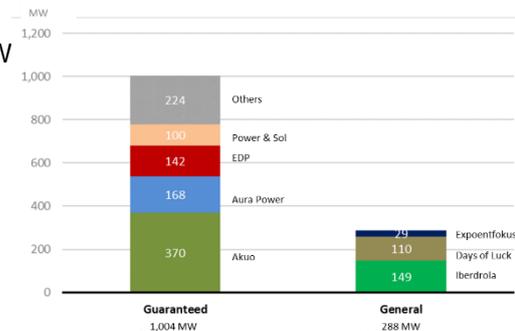
The capture price spread

We identify the difference between the base-load pool price and the actual hourly price realized by a specific technology (PV). The report provides our analysis of the impact of future development of Solar PV, which will lead to a cannibalization effect (an increase in negative capture price spread).

Solar PV auction result

Within the report, we analyze the results of the recent PV auction and its potential impact on the market, as well as responding to several key questions.

What do the results mean for the market? Will they hinder the flourishing PPA market, will they encourage or deter investment in the market? Will the Government’s NECP target for 2030 be at risk?



Regulatory uncertainties

The regulatory measures that have been published recently as well as the evolution of the Clawback mechanism, are analyzed in the Report.

Bespoke services

As regulation and market experts, we have a broad understanding of business requirements to deliver bankable reports and models, with the option of providing the following bespoke services:

- Tailored price sensitivities using Client’s assumptions,
- Portfolio and plant specific assessments to determine capture price, and
- “Lenders case” analysis based on Low Risk market case.

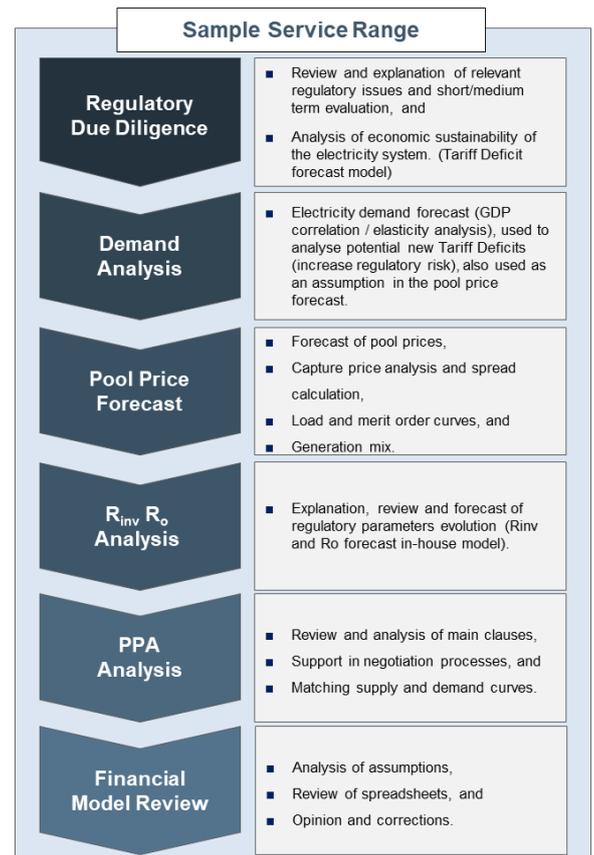
PMM Power Market Model

Our pool price / PV capture price model is based on a deterministic dynamic linear programming approach with the objective of minimizing the present value of fuel, maintenance, and capital investment costs across the whole forecast horizon. Resulting prices, dispatch, fuel use, and capacity expansion are optimal for each set of input parameters.



Our Philosophy

- Work on complex and large transactions, offering a full range of services from a high level red-flag report, all the way through to complete advisory services to buyers and sellers of assets or energy related businesses.
- Leverage on our experience in both conventional (coal, CCGT, cogeneration and nuclear) and RES (hydro, wind, solar) generation, electricity and gas infrastructure (electricity distribution, gas pipelines and regasification terminals), PPAs (power purchase agreements) and GSAs (gas supply agreements).
- Offer in-house models, internally developed, for long term (>25 years) pool price projections in order to be able to provide a full scope of services on an asset by asset or a portfolio basis, or an entire business.
- Provide robust and traceable financial models that can be easily audited but also allow for complex valuations.
- Work closely with the client and their financial, legal and technical advisors in preparing the deal or assisting in the negotiation phase.



Our Services

EKON carries out market assessment and screening as well as economic due diligence involving market price forecasts, review of fuel supply, O&M and other contracts, operating margins and financial loans contracts review.

EKON is specialized in arbitration at an international level. EKON, as an independent adviser and expert witness, has participated in some of the renewable arbitration claims from financial investors against the Spanish State.



EKON offers analysis, risk assessment and contract structuring advice to buyers or sellers of energy under Power Purchase Agreement ("PPA"). Our in-house electricity price forecasts from the Power Market Model are central to our recommendation on pricing PPAs.

EKON works on complex and large transactions, offering a full array of services that can range from a high level red-flag report, to complete advisory services to buyers and sellers of assets or energy related businesses.

EKON Strategy Consulting is based in Madrid and provides key services in the Energy Sector that cover a broad range of Strategic and Operational Services for our Clients (Banks, Utilities, IPPs and Governmental Agencies and Authorities).

EKON's regulatory and market due diligence reports (including our price projections) have been relied upon by leading banks, utilities and infrastructure funds when investing and/or seeking finance for large energy investments. Our experts have participated in international arbitration and investor/state disputes.

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