Portuguese Auction 2020 Review

A note from AFRY Management Consulting

October 2020
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</table>

AFRY is an international engineering, design and advisory company. We support our clients to progress in sustainability and digitalisation. We are 17,000 devoted experts within the fields of infrastructure, industry and energy, operating across the world to create sustainable solutions for future generations.

AFRY Management Consulting provides leading-edge consulting and advisory services covering the whole value chain in energy, forest and bio-based industries. Our energy practice is the leading provider of strategic, commercial, regulatory and policy advice to European energy markets. Our energy team of over 250 specialists offers unparalleled expertise in the rapidly changing energy markets across Europe, the Middle East, Asia, Africa and the Americas.
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PORTUGUESE SOLAR AUCTION 2020

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Portugal has been consistently appearing in the news headlines worldwide over recent weeks as a result of the successful renewable auction celebrated during 24th and 25th of August. So, what is all the fuss about? What is the meaning of the results? How could Contract-for-Differences (CfDs) have gone as low as €1.2/MWh for a 15-year period? This note prepared by AFRY Management Consulting (AFRY) aims to answer all of these questions by doing an independent analysis of the auction and the official published results.

1 Introduction
At the end of April 2019, the Portuguese State Secretary for Energy announced that Portugal would tender grid injection capacity for solar photovoltaic (PV) projects. The aim of the introduction of such auctions is twofold:

— foster the capacity increase that the Government foresees in its National Energy Climate Plan (NECP) by providing regulatory (and potentially remuneration) certainty; and

— put some order in the application process for grid injection capacity, given the high amount of grid requests experienced in Portugal, of which many could be considered speculative.

The introduction of these auctions through Decree Law 76/2019 provided developers two routes for deploying projects: 1) pay for the grid reinforcements and connections required to inject energy into the network; or 2) be awarded through a competitive auction process.

The 2019 auction resulted in the award of 1.3GW for solar PV projects with expected commissioning date over the next few years. The recent 2020 auction came in to modify the previous year auction by introducing a third route to market aiming at reward flexibility. The following sections provide insights on the corresponding outcomes.

2 Auction 2020 mechanism
The auction recently celebrated in 2020 auctioned 700MVA of injection capacity in interconnection points, both at distribution and transmission level, distributed in the regions of Alentejo and Algarve; the injection capacity was auctioned through 12 different lots, with injection capacity ranging from 10MVA up to 109MVA. Figure 1 shows the indicative location of the capacity auctioned as well as some indicative lifetime average load factors for solar PV projects according to AFRY’s assessment.

The 2020 auction offered three different routes-to-market in order to compete for the auctioned injection capacity:

— **CfD**: solar standalone solution in which the developer receives a fixed tariff for a 15-year period.

— **Fixed compensation to the system**: solar standalone solution in which the developer pays the system for the interconnection point for a 15-year period, being the project subject to merchant prices.

— **Flexibility option**: storage solution in which: 1) the developer receives a fixed payment for a 15-year period; 2) the project is subject to merchant prices; and 3) the project remunerates the system for the hours in which the wholesale price is higher than a pre-defined strike price for a 15-year period.

Following the success of the auction celebrated in August 2019, the remuneration scheme adopted for the 2020 auction is pay-as-bid, in which the auction is celebrated under the format of an ascending clock.
In order to compare the three routes-to-market and assess which is the most beneficial for the system, the bids of the different participants are compared through a Net Present Value (NPV) calculation. The NPV calculation included in the auction is based on an assessment of the projected benefits that each route could provide to the system:

- **CfD**: difference between a solar capture price projection and the CfD awarded.
- **Fixed compensation to the system**: payment offered from the developer to the system.
- **Flexibility option**: projected contribution from storage solutions to the system for the activation of the strike price minus the capacity payment required by the developer.

The discount rate applied in the calculation for the fixed compensation to the system is set at 2.5%. For the two routes-to-market that involve market projections in the assessment of the benefits for the system (i.e. CfD and flexibility option), a higher discount rate (i.e. 3.61%) is used to calculate the NPV; this reflects the higher risk perceived from the inherent risk existing in projecting future savings.

In addition, in order to guarantee transparency of the process, the market price forecast used to project the price spreads to be factored in the NPV calculation was made public by the Portuguese Government ahead of the auction. This way, fairness of the process was also guaranteed, as all players had in advance all of the information by which the government would value their bids. AFRY supported the Portuguese Government throughout the process.

The 2020 auction is evaluated in €/MVA; when necessary, payments are converted into MWh terms using a pre-defined expected lifetime average load factor for solar projects, set at 1,957 and 1,958 equivalent hours depending on the lot.

The following subsections explain in detail the three different routes-to-market offered in the 2020 auction, emphasizing the benefits and obligations under each of the options.

### 2.1. CfD

After the 2019 auction was celebrated, concerns were raised regarding the limited exposure to market procedures that generators could have under the fixed tariff regime. According to the 2019 auction, a successful generator would sell 100% of its output to a regulated off-taker and energy management-wise, would have to nominate its generation volumes and be liable for imbalances. Bearing in mind that the contract with the regulated entity has not been disclosed, it is unclear what the full extent of obligations of the 2019 fixed tariff auction winners will be. However, from a state-aid guideline perspective, fixed payments should not be implemented and supports should be provided in terms of a premium to market prices. Although in terms of average revenues in €/MWh there is not any difference, the level of engagement with market procedures is higher if the generator has more commercial obligations.

As a result, for the 2020 auction, instead of a fixed tariff, the second remuneration regime will encompass a fixed price contract for differences that will be settled on a monthly basis with the market operator. This means that generators will have to sell their electricity in the day-ahead market or enter into an agreement with a market agent who does the trading on their behalf. In terms of the bid evaluation in this auction, the effective fixed payment in €/MWh will be compared against a forecasted captured price for the specific injection point, which will lead to forecasted yearly surpluses or deficits as follows:

![Figure 2 - Example of possible bid and respective contribution to the system in the fixed price option (nominal money)](image-url)
in the years that the fixed payment is forecasted to be above the captured price, a system deficit occurs, and the generator is entitled to collect the cash balance; and

— in the years that the fixed payment is forecasted to be below the captured price, a system surplus occurs, and the generator would be liable for the cash balance.

The following aspects affect the offer ranking is produced. The competitiveness of the bid and an estimate for the number of equivalent hours of operation for the zone in question, as previously commented. These contribution/payments figures in €/MVA will then be used in the calculation of the NPV in order to assess the competitiveness of the bid and an offer ranking is produced.

The following aspects affect the CfD route:

— Bidder offers a discount, in percentage, to the reference fixed payment.

— The bid (i.e. discount over the reference payment) is compared against forecasted captured price in €/MWh nominal, resulting in contributions/payments to the system.

— Surplus and/or deficits in €/MWh per year are converted to €/MVA using estimated number of generation hours in particular injection point.

— The bid value will be the NPV of the surplus/deficits discounted at a fixed rate increased by a risk factor.

— The bids are ranked by node according to the NPV contribution to the system in order to be able to award the capacity.

— If successful the bidder receives grid injection capacity, accesses wholesale markets, including ancillary services markets, and will be entitled to a fixed payment in €/MWh during 15 years.

Figure 2 presents a CfD bid example in which the offered bid is set at a 2% discount over the reference auction parameter. Illustrative fixed payments (effective and received) and capture prices are shown in the right axis, while contribution/payments to the system are shown in the left axis; the resulting differences in €/MWh will be converted in €/MVA using an estimate for the number of equivalent hours of operation for the zone in question, as previously commented. These contribution/payments figures in €/MVA will then be used in the calculation of the NPV in order to assess the competitiveness of the bid and an offer ranking is produced.

2.2 Fixed compensation to the system

After the 2019 auction was celebrated, concerns were raised regarding the possibility that a payment in €/MWh could distort the market supply curve. The consideration of the resultant payment in the bidding as a variable cost could: 1) increase wholesale prices artificially at an amount not corresponding to pure variable costs at moments of high renewable resource when the projects awarded under this option are setting the marginal prices; and 2) reduce the revenues collected by the system from these projects as they could experience higher curtailment than other renewables due to higher variable costs.

As a result, for the 2020 auction the Government implemented a contribution to the system in €/MVA as shown in Figure 3.

The following aspects affect the fixed compensation to the system route:

— Bidder offers a yearly contribution to the system to be paid for a period of 15 years in €/MVA nominal.

— The NPV of this option will be the contribution during the 15 years awarded in the auction discounted at a fixed rate of 2.5%, lower than the other alternatives.

— The bid is ranked according to the NPV estimated in order to allocate the capacity.

— If a successful bidder receives grid injection capacity, it receives access to the wholesale and ancillary services markets and pays annual contribution to the system in €/MVA (during the first 15 years of operation).
2.3 Flexibility option

For the third revenue scheme, the one that values storage, generators will establish a 15-year contract with the system operator (i.e. REN) in which every time the wholesale electricity price goes above a certain threshold (i.e. strike price), generators have to return to the system the difference between electricity price and strike price multiplied by 90%. This strike activation cost is then multiplied by the total injection capacity awarded in the auction.

The strike price is predefined in the auction conditions and is to remain unchanged for the projects awarded in the 2020 auction. The strike price will vary quarterly according to the forecasted evolution of the marginal cost of a Combined Cycle Gas Turbine (CCGT). The entire curve was made publicly available to grant transparency and equity to all players.

In return, generators are entitled to a fixed payment defined in €/MVA of injection capacity for a 15-year period. This option is only available for generators with some sort of storage capacity.

This contract settlement will be made on a monthly basis and occurs regardless of the generation patterns of the facility. In other words, it is a capacity-based contract.

As a numerical example for a specific hour:

- Wholesale price: €90/MWh.
- Strike price: €60/MWh.
- Injection capacity: 100MW.
- Amount to be returned to the system:

\[(€90/MWh - €60/MWh) \times 100MW \times 90%\]

Although this seems a purely financial contract, the generator will have to comply with some technical requirements: 1) the storage capacity must be minimum 20% of the injection capacity requested by the bidder and must have minimum 1h of storage; and 2) the storage facility will be submitted to periodic availability tests performed by the system operator. As long as they comply with the minimum requirements, interested parties are free to choose the technical parameters of the storage facility, such as capacity and hours of storage.

Figure 4 exemplifies the analysis of a storage bid in the 2020 auction. From the system perspective, the sum of the forecasted activation of the strike prices (i.e. sum of positive differences between wholesale price and strike price during 15 years multiplied by 90%) will be a benefit or a surplus (red line charted in the right axis of Figure 4). The fixed payment that generators will require from the system will be a cost (dashed black line charted in the right axis of Figure 4). This payment will be set depending on the offered discount per generator (illustratively set at 5% in Figure 4) versus a stipulated reference payment defined by the government (solid black line charted in the right axis of Figure 4).

In the years that the fixed payment is forecasted to be above the benefit from the contract activation, a system deficit occurs. In the years that the fixed payment is forecasted to be below the captured price, a system surplus occurs – blue bars charted in left axis of Figure 4.

In summary, the following aspects affect the flexibility option:

- Bidder offers a discount, in percentage, to the reference payment, being the effective payment it will collect.
- The fixed payment (i.e. reference minus discount) is compared against forecasted benefit from option activation (in €/MVA-year nominal).
- The bid value will be the NPV of the surplus/deficits discounted at a fixed rate increased by risk factor.
- The bid is integrated in the ranking so it can be valued in equal terms with the other bids.
If successful the bidder receives grid injection capacity, accesses wholesale and ancillary services markets, receives a fixed annual payment in €/MVA and pays the settlement of the contract activation.

In order to enhance the reader’s understanding on the revenue and cost structure of a project under the modality of **flexibility option**, AFRY has summarised the most important components of a simplified cash flow analysis in Figure 5; the boxes in white are the ones directly affected by the auction, while the rest will depend on the costs and performance of each project in the market.

### FIGURE 5 – REVENUE AND COST STRUCTURE OF A STORAGE PROJECT AWARDED IN THE AUCTION

#### REVENUES
- **Energy**
  - Day-ahead market
  - Intraday market
- **Ancillary services**
  - Technical constraints
  - Secondary band
  - Secondary regulation
  - Tertiary regulation

#### COSTS
- **Consumption costs**
  - Day-ahead and intraday markets
  - Ancillary services
- **Variable fees**
  - Generation tax
  - Transmission and market operator variable fees
- **O&M costs**
  - O&M cost
- **Payment to the system**
  - 15-year payments as awarded in the auction
- **Strike price activation**
  - Difference between the pool price and a pre-defined strike price for a 15-year period
- **Fixed capital cost**
  - Investment and capital costs
The 2020 auction was celebrated during 24th and 25th August 2020. Although it was expected that the auction would be competitive, given the 10 times oversubscription announced by the Government during the weeks before the celebration of the auction, it surpassed all expectations. Of particular interest was the success of projects under the flexibility option modality, showing the maturity of storage solutions and possibly the beginning of a new era for renewable developments.

The following sections will depict in detail the official auction results available at the moment of writing this note, comparing the results with the Portuguese auction celebrated in 2019 as well as with other auctions celebrated worldwide, and including an assessment of the benefits that the 2020 auction is expected to provide to the Portuguese system.

3.1 Specific results

According to official results, out of the total 700MVA of capacity auctioned, 670MVA were finally awarded. The split of injection capacity for the different modalities is illustrated in Figure 6.

The detailed auction results per auctioned lot are summarised in Table 1 for the modality of CfD, Table 2 for the fixed compensation to the system modality and Table 3 for the flexibility option modality.

Six different companies from all around the world have been awarded with bids under the different modalities:

- Solarengoradar – Unipessoal, Lda. was the only winner under the CfD modality, establishing an average fixed tariff of €11.14/MWh, which corresponds to a discount of 73.30% over the reference tariff established in the auction.

- Green Show Lda. and TAEENERGY, S.A. were the two winners under the fixed compensation to the system modality, with a capacity awarded of 157MVA and 20MVA, respectively. For this, they offered a capacity weighted-average payment of €75,128.7/MVA and €64,229.3/MVA respectively. These payments would be equivalent to a payment from the developers to the system of €38.37/MWh and €32.82/MWh respectively, considering the production parameters published in the auction.

- Hanwha Q Cells GmbH, Endesa Generación Portugal, S.A. and Iberdrola Renewables Portugal, S.A. were winners under the flexibility option modality with a capacity awarded of 315MVA, 99MVA and 69MVA respectively. The bids were cleared at a discount of more than 100% of the reference capacity payment, showing that the winners were willing to contribute to the system instead of receiving a payment. The bids resulted in capacity weighted-average payments of €44,065.4/MVA, €29,491.0/MVA and €16,159.2/MVA respectively. These payments would be equivalent to a payment from the developers to the system of €22.51/MWh, €15.07/MWh and €8.26/MWh respectively, considering the production parameters published in the auction.

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**FIGURE 6 – CAPACITY AWARDED PER REMUNERATION SCHEME**
### TABLE 1 – RESULTS FOR THE SOLAR STANDALONE – CFD MODALITY (NOMINAL MONEY)

<table>
<thead>
<tr>
<th>ID</th>
<th>Lot</th>
<th>Company</th>
<th>Capacity awarded (MVA)</th>
<th>NPV (€/MVA)</th>
<th>Discount, in %, to the reference fixed payment</th>
<th>Awarded CFD (€/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>Solarengoradar – Unipessoal, Lda</td>
<td>10</td>
<td>685,441.36</td>
<td>73.30</td>
<td>11.14</td>
</tr>
</tbody>
</table>

Source: Gabinete do Ministro do Ambiente e da Ação Climática, ADENE

### TABLE 2 – RESULTS FOR THE FIXED COMPENSATION TO THE SYSTEM MODALITY (NOMINAL MONEY)

<table>
<thead>
<tr>
<th>ID</th>
<th>Lot</th>
<th>Company</th>
<th>Capacity awarded (MVA)</th>
<th>NPV (€/MVA)</th>
<th>Fixed compensation to the system (€/MVA)</th>
<th>Equivalent compensation to the system (€/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Green Show – Lda</td>
<td>99</td>
<td>903,616.00</td>
<td>72,976.50</td>
<td>-37.27</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>Green Show – Lda</td>
<td>54</td>
<td>978,437.30</td>
<td>79,019.10</td>
<td>-40.36</td>
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<td>3</td>
<td>4</td>
<td>Green Show – Lda</td>
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<td>939,492.53</td>
<td>75,873.90</td>
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<td>TAGENERGY, S.A.</td>
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<td>795,305.73</td>
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<td>5</td>
<td>9</td>
<td>TAGENERGY, S.A.</td>
<td>10</td>
<td>795,305.73</td>
<td>64,229.30</td>
<td>-32.82</td>
</tr>
</tbody>
</table>

Source: Gabinete do Ministro do Ambiente e da Ação Climática, ADENE

### TABLE 3 – RESULTS FOR THE FLEXIBILITY OPTION MODALITY (NOMINAL MONEY)

<table>
<thead>
<tr>
<th>ID</th>
<th>Lot</th>
<th>Company</th>
<th>Capacity awarded (MVA)</th>
<th>NPV (€/MVA)</th>
<th>Fixed compensation to the system (€/MVA)</th>
<th>Equivalent compensation to the system (€/MWh)</th>
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</thead>
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<tr>
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<td>Hanwha Q Cells GmbH</td>
<td>109</td>
<td>795,306.11</td>
<td>207.33</td>
<td>-18.38</td>
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<td>2</td>
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<td>Endesa Generación Portugal, S.A.</td>
<td>99</td>
<td>721,004.67</td>
<td>18793</td>
<td>-15.06</td>
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<td>Hanwha Q Cells GmbH</td>
<td>50</td>
<td>978,437.30</td>
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<td>Iberdrola Renewables Portugal, S.A.</td>
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<td>568,763.32</td>
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<td>-8.25</td>
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<td>Hanwha Q Cells GmbH</td>
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<td>10</td>
<td>Hanwha Q Cells GmbH</td>
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<td>7</td>
<td>11</td>
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<td>8</td>
<td>12</td>
<td>Hanwha Q Cells GmbH</td>
<td>19</td>
<td>1,060,043.28</td>
<td>276.31</td>
<td>-30.20</td>
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</table>

Source: Gabinete do Ministro do Ambiente e da Ação Climática, ADENE
Figure 7 shows AFRY’s independent assessment of the overall revenues that would be collected by each of the awarded projects according to the information previously introduced. For the fixed compensation to the system and the flexibility option modalities, revenues have been computed as AFRY’s Q3 2020 Central solar capture price projections minus the payments resultant from the auction.

The projects awarded under the modality flexibility option show higher revenues than the solar standalone awarded projects; however, the reader is reminded that the projects awarded under this modality have an extra cost with the system correspondent to the strike price activation; the adjusted revenues discounting AFRY’s Q3 2020 Central projections for the activation costs are shown in a dashed circle in the figure 7.

3.2 Benefits for the system

The 2020 auction results imply an estimated benefit for the system around €427m based on AFRY’s Q3 2020 Central hypothesis. This assessment has been done calculating the NPV for the each of the awarded bids (as previously explained in Sections 2.1, 2.2 and 2.3), although using AFRY’s independent price projections on solar capture prices and strike price activation.

The flexibility option modality represents the largest share of savings for the system, accounting for approximately 61% of the total savings. The fixed compensation to the system follows, with an estimated share of 37% of the total savings. The remaining 2% of the savings is represented by the CfD modality.

Figure 8 shows the projected savings for the system annually1 under AFRY’s Central Q3 2020 projections.

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1 Not considering revenues for the provision of ancillary services or for price arbitration opportunities for storage, due to the lack of the storage specifications of the winning bids.
2 Assuming that all projects are commissioned in July 2024.
The savings for the system experience an increasing trend throughout the observed period as a result of the higher contribution from the strike price activation from projects awarded under the category flexibility option.

AFRY’s projections of savings are slightly different than the savings that can be computed using the Government’s projections included in the auction documents; the comparison in savings is shown in detail in Table 4. There is a difference in the savings assumed from the flexibility option modality, as the Government’s projections on the strike price activation are considerably higher than AFRY’s Q3 2020 Central projections in the short and medium term, being aligned at the end of the 15-year period awarded in the auction.

### 3.3 Comparison with 2019 auction results

The 2020 auction results, previously summarized in Table 5, show a relevant decrease in the equivalent tariffs received by the companies compared to the results of the 2019 auction, summarised in Table 5. The contribution to the system for projects under the fixed compensation to the system modality almost doubled from the quantities resultant in 2019, while the CfD tariffs almost halved from 2019.

Regarding the savings for the system estimated for the 2019 auction results based on AFRY’s Q3 2020 Central hypothesis, they amount to €669m, whilst the 2020 were estimated around €427m as exposed in Section 1.3.2, amounting in total to more than €1bn. This decrease in the overall savings for the system in the 2020 auction is as a result of the lower capacity auctioned; savings per MVA in the 2020 and 2019 auction are m€0.63/ MVA and m€0.52/MVA respectively, reflecting higher savings for the 2020 auction.

Figure 9 shows the annual savings for the system for 2019 auction results, according to the AFRY's Q3 2020 Central projections. The yearly savings are stable throughout the observed period, being the highest savings the ones correspondent to the former fixed tariff modality.

<table>
<thead>
<tr>
<th>TABLE 4 – COMPARISON OF PROJECTED SAVINGS BETWEEN AFRY’S Q3 2020 CENTRAL SCENARIO AND THE GOVERNMENT PROJECTIONS (NOMINAL MONEY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total savings (m€)</td>
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<tr>
<td>AFRY’s Q3 2020 Central scenario</td>
</tr>
<tr>
<td>Government’s scenario</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 5 – COMPARISON OF RESULTS BETWEEN THE 2020 AND THE 2019 AUCTION (€/MWH, NOMINAL MONEY)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Fixed compensation to the SEN</td>
</tr>
<tr>
<td>Fixed tariff</td>
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Source: Gabinete do Ministro do Ambiente e da Ação Climática, ADENE

FIGURE 9 – PROJECTED SAVINGS FOR THE SYSTEM FOR THE 2019 AUCTION, AFRY’S Q3 2020 CENTRAL SCENARIO (NOMINAL MONEY)
3.4 Comparison with other auctions worldwide

Figure 10 presents an evolution of the clearing prices of the different solar PV auctions celebrated worldwide since 2014. The results of the Portuguese auctions celebrated in 2019 and 2020 are highlighted in orange. For the auctions that have some merchant component in exchange of a fixed payment, such as the ones celebrated in Portugal, the equivalent cleared price of the auction has been calculated as our latest projections for solar capture prices minus the awarded payment.

In general, prices have been decreasing steadily as a result of decreasing investment costs, gains in efficiency and an increasing competitiveness and aggressiveness worldwide from renewable developers. The 2019 Portuguese auction set a low-record price, which was not met until some months ago in the United Arab Emirates (UAE). The 2020 Portuguese auction has continued the decreasing trend of solar PV auctions, setting a new low-record price:

- The overall record for a CfD or similar regime (e.g. Feed-in-Tariff) has been set by Solarenergoradar – Unipessoal, Lda.
- The overall record corresponds to the prices set by Green Show – Lda under the fixed compensation to the system.
- The first hybrid projects with storage auctioned in the world have been auctioned in the 2020 Portuguese auction, resulting in some of the projects as low as the previous low record of UAE set earlier in the year.

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3 Portugal* reflects the average price for storage in the 2020 Portuguese auction.
4 Stories of success

Enel Green Power

Antonio García Gallego,
Head of Business Development Portugal

“At Enel Green Power, we are very satisfied with the auction results, which will allow us to keep promoting the energy transition towards our global decarbonization objectives and to grow in one of our core markets, Iberia.

“The new tender design, introducing the possibility of proposing integrated PV solar + storage solutions, allowed us to leverage on our expertise in hybrid solutions in order to differentiate our value proposition and be able to present a winning bid with an attractive return for our shareholders in an extremely competitive environment.

“We believe that valuing the flexibility granted by hybrid projects including storage when compared to stand-alone solar plants is the right move for the government, as it will facilitate the entry of a higher share of renewable sources into its energy mix, moving it one step forward towards its objective of carbon neutrality by 2050, while maximizing value for final consumers. We hope other EU countries will follow this example, giving bidders the opportunity to integrate the storage option into RES auctions.

“Another change in tender design (when compared to the 2019 auction) that we believe was very positive is the longer period allowed between tender announcement and bid submission, as it gave bidders more time to study and optimize their projects, resulting not only in more competitive bids but also in more solid proposals, with a higher probability of realization. We hope this trend will continue in future tenders and that other dimensions, such as project maturity or social impact, will be added into the mix when it comes to awarding criteria.”

Portuguese Government

“This years’ solar auction was again a resounding success setting a new world record for the lowest solar tariff price. The remuneration option that had more lots allocated, flexibility/storage option, was launched only in this 2020 auction and its results were a very welcome surprise, since winners renounced receiving the annual capacity payment, ending up paying the SEN1 an annual capacity payment. Adding to this fixed annual payment, the winners will have to insure the SEN against wholesale electricity price spikes, hence given the Portuguese electricity consumers a potential additional revenue. Simultaneously, the transport and distribution grids will count with new storage capacity of 100 MW (minimum), giving more needed flexibility to the system by contributing to absorb surplus renewable electricity in the grid and releasing it when it will be needed the most.

“AFRY’s role in the success story of the 2019 and 2020 auctions was invaluable for the precious insights given and the work put in the tender's construction. Going forward, the Government plans to expand the frontiers of solar PV deployment in the next solar auctions, which are already being planned, considering all the suggestions and lessons learned from the first two. The next tenders will have new implementation possibilities meaning floating solar PV, particularly in the dam reservoirs, among other possible locations.

“This will be an important challenge on the technical side, once again we will count on AFRY's expertise, but at the same time the promoters will gain an important risk mitigation, on the land availability and the costs that come with it.”

1 Sistema Eléctrico Nacional
The Portuguese 2020 auction has shown a successful way to go in order to reach long-term energy objectives in a competitive manner, maximizing the benefits for the system and the end-users. The auction has proven to tackle three different objectives simultaneously, while providing benefits for the system:

1. increase the renewable penetration;
2. increase the flexibility of the system in order to better integrate renewables into the system; and
3. provide firm capacity that contributes to the security of supply of the system.

The results published were even more surprising than the ones from the 2019 auction. The 2020 auction resulted in 670MVA of injection capacity awarded in 12 different injection points in Portugal. This year, the auction offered an additional opportunity for storage pioneers to participate, and the debut has been spectacular. It seems that storage has arrived to stay with us for a long time.

As commented by ENEL Green Power and the Portuguese Government, hybrid solutions are the right move to increase flexibility of the system, supporting in the integration of renewables. This new tender design also leverages the potential of the players to integrate storage and renewables, moving towards a pathway of innovation and costs optimization.

The auction has broken all the records of any other competitive solar PV auction celebrated worldwide, resulting in both the most competitive solar standalone projects and projects with storage. The commissioning of these awarded projects would translate in savings for the Portuguese system and thus the end-consumer of c. €28m/year in AFRY’s analysis.

The two auctions celebrated in 2019 and 2020, providing a platform to reach long-term goals while bringing benefits to the system. The Portuguese experience can represent a new international benchmark and it certainly is a success case from which other countries and regulators could learn from.

AFRY would like to congratulate the Government, the Secretary of State and all the organizers and parties that made the auction possible in such difficult times. We are looking forward for the new opportunities coming in the following years, which will indeed involve some technical implementation challenges, as the Government has already revealed.

AFRY Management Consulting is the leading advisor to the world’s energy, forest and bio-based industries. Our dedicated team of over 450 consultants, across 17 offices on 3 continents, provides strategic and operational advice across the value chain, underpinned by deep expertise and market insights.

As part of AFRY, our management consultants are backed by 17,000 engineers, designers and advisors within infrastructure, industry and energy who are at the cutting-edge of technology and have collective expertise that spans industries and geographies.

AFRY has over 20 years’ experience in energy markets and, since 2010, our consulting team has valued around 310GW of electricity generation capacity across Europe, the Middle-East North African region and the Americas with a combined value above USD390bn. In addition to transactions we provide our AFRY Independent Market Report with annual baseload price projections for 58 countries, which is relied and trusted by utilities, banks and independent players for use in numerous strategic and commercial valuations.

We additionally add value to our clients through a range of other services:

- strategic advisory services on market positioning within the supply chain, by technology and across geographies;
- transaction support services spanning:
  - M&A advisory (including commercial, market and technical due diligence);
  - sell-side support for attracting investment in or disposal of, assets; and
  - Lenders’ Market Advisor services to support the project financing of generation assets.
- asset-specific revenue assessments providing price projections tailored to a specific project and/or portfolio; and
- expert determination and expert witness services for contract disputes.

The future outlook for the Portuguese system brings many uncertainties and many challenges in which AFRY’s analytical tools and industry knowledge can help our clients understanding the upsides and risks of their future investments or developments.
AFRY is an international engineering, design and advisory company. We support our clients to progress in sustainability and digitalisation.

We are 17,000 devoted experts within the fields of infrastructure, industry and energy, operating across the world to create sustainable solutions for future generations.

Making Future