FACTSHEET
RENEWABLE ENERGY AUCTION DESIGN FOR TURKEY

PROMOTION OF GRID-CONNECTED
RENEWABLE ENERGY IN TURKEY

T.C.
ENERJİ VE
TABİİ KAYNAKLAR
BAKANLIĞI

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Content

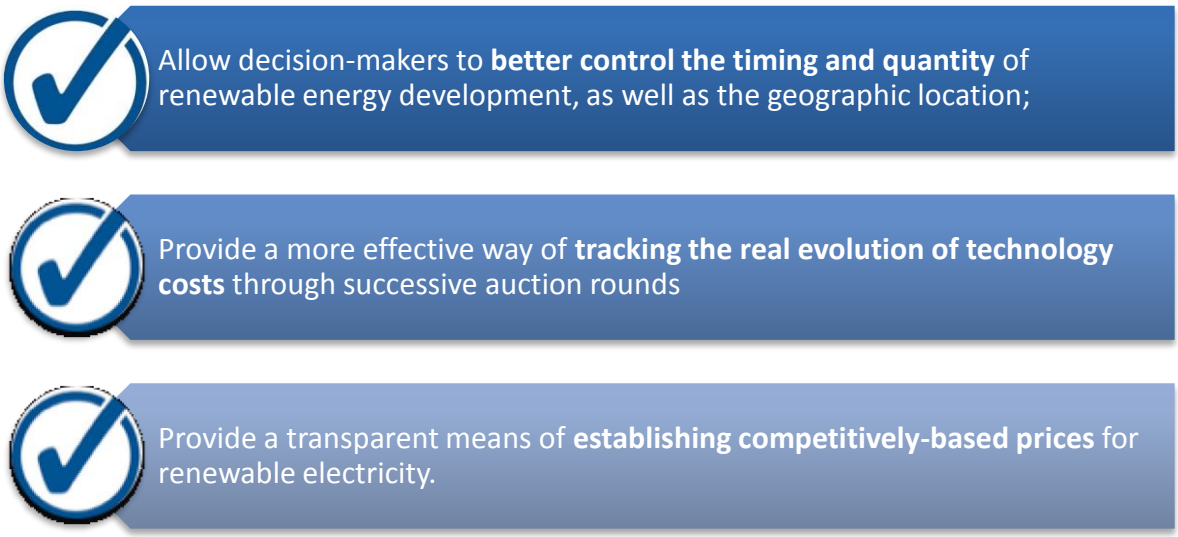
1. Auction mechanisms

This Factsheet is designed to provide a concise and accessible overview of renewable energy auctions. The Factsheet covers the key principles of auction design, the core design elements, implementation-related considerations, as well as concrete examples from jurisdictions around the world. The target audience is policymakers in Turkey, and the goal is to assist experts and decision-makers to develop a more comprehensive understanding of the pros and cons of auction mechanisms, as well as the trade-offs between different design choices.

1.1 Introduction to auction mechanisms

Renewable electricity auctions have spread rapidly around the world. As auctions have spread, a wide range of different terms has been used to describe them, including auction mechanisms, competitive tendering, competitive solicitations, and simply bidding mechanisms. This Factsheet uses the term “auction” as an inclusive term covering these various different auction designs.

The main alternative procurement mechanism to auctions is feed-in tariffs (FITs) (Kreycik et al. 2011; Couture, Jacobs, et al. 2015). However, as has become clear in recent years, one of the most difficult aspects of designing a successful FIT policy is determining the right tariff level and adjusting it over time as market and technological circumstances change. In this respect, well-designed auctions help achieve a number of important policy objectives:



While these highlight a number of important advantages of auctions, the growing international experience with auctions from countries including Brazil, South Africa, as well as from developed markets like Germany and the U.S. is that there auctions also have a number of risks, or downsides, that need to be carefully addressed, or mitigated, in the policy design:

1. **Low realization rates:** very few auctions succeed in contracting the full amount of capacity they set out to achieve, even when the original bid volumes (in MW) is far greater than the capacity targeted. Reasons for low realization rates include high competition between bidders resulting over-optimistic cost and performance assumptions, the failure to notice barriers or bottlenecks that could negatively impact project development, regulatory uncertainty, difficulties obtaining grid access rights, etc. Without successful project completion, auctions lose one of their major advantages, namely the ability to better control the timing and quantity of renewable energy developed.
2. **Under-bidding:** experience in many countries suggests that under-bidding poses a major problem in most auctions that have been implemented to date and relates to the first point above about low realization rates. Under-bidding is usually due to high competition in auction and the "need" for participants to win at any cost. This is sometimes referred to as "the winner's curse", since the winner who has proposed very low prices might be bound to realize the project without making any profit. A range of different solutions have been put forward to help mitigate under-bidding, including penalties for non-compliance, bid deposits, and stricter pre-qualification requirements.
3. **Lack of competition** (insufficient number of bidders): in certain auctions, there are too few bidders to yield genuinely competitive results. If too few bidders are present, the risks of collusion are significantly increased, which can lead to higher (i.e. less competitive) prices, and a greater impact on ratepayers (Kreiss 2016).[1]
4. **Higher risks for investors:** due to the higher risks of not obtaining one of the winning bids, auctions typically result in a higher cost of finance (i.e. higher interest rates on debt and/or equity provided) than other mechanisms. Compared to feed-in tariffs, for instance, the risk is higher namely in the project preparation phase. Once the bidder has won the auction and the power purchase agreement is issued, auctions can arguably offer investment security comparable to that of feed-in tariffs as both result in a long-term contract for power output. In light of the significant time and upfront investment required in order to prepare a compliant bid (obtaining permits, developing detailed plans, conducting resources assessments, accessing land, securing local legal counsel, etc.), these higher risks can act as an important deterrent to many potential bidders, reducing competition (see #3 above), as well as potentially increasing the costs to ratepayers (or to the utility purchasing the power).

[1] http://auresproject.eu/sites/aures.eu/files/media/documents/policy_memo-4_competition_2511016.pdf

INSIGHT: Mitigating Low Realization Rates

One of the primary ways to improve realization rates is to have substantial pre-qualification requirements. There are broadly three forms of pre-qualification requirements, the first of which needs to be met in order to proceed to the others:

1) access requirements: these typically include a range of basic requirements in order to enter into the auction itself. This includes occasionally a fee in order to access the bid documents, certain threshold requirements concerning a company's minimum annual turn-over, company size and financial capacity, the track record of the proponent building similar projects in the recent past, the technical know-how of the proponent, etc.

2) financial pre-qualification requirements: this typically takes the form of a bid deposit or bid security that has to be submitted to the auctioning agency and is returned upon successful completion of the project, or if the bidder is not selected; this security is often set at around 5% of the project's investment cost, or expected lifetime revenue (Kreiss et al. 2017). The bid security is usually defined as a certain value per capacity bid (e.g. 50€ per kW).

3) material pre-qualification requirements: this often takes the form secured land, of construction plans, obtainment of construction permits, environmental impact approvals, secured grid access, etc.

While having stringent access and pre-qualification requirements can help ensure that bidders are well-positioned to undertake the proposed projects, excessively high pre-qualification requirements can reduce the number of bidders considerably and thus reduce the overall level of competition. In turn, lower competition is likely to result in higher prices. When setting the prequalification requirements, policymakers thus need to strike a balance between the need to assure project realization without limiting competition.

2. Auction Types

There are two primary types of auctions that are used for renewable energy projects:

Auction Types	Description
1. **Static or "Sealed Bid" Auctions**	Under a sealed-bid auction, bidders submit their proposals in a "sealed envelope" and there is only one bidding round: bidders are therefore typically bound by the terms and prices set out in their proposal. **Sealed-bid auctions are typically (but not always) pay-as-bid**, which means all winning bidders receive the price that they proposed (see Section 4 below). The auction agency gathers all bids and creates an aggregated supply curve until the total amount of capacity (MW) targeted by the auctioning agency is reached. The term 'sealed bid' refers to the fact that other bidders have no information about the bidding price of their competitors and that bidders cannot adjust bids in subsequent rounds. → Most renewable energy auctions are currently "sealed bids". Administrative complexity is relatively low. These types of auctions are also seen to be best in markets where there are few bidders or where the risks of collusion are highest.
2. **Dynamic Descending Price Auctions** (also referred to as "descending clock auctions" or "Dutch" auctions)	Under a dynamic, descending clock auction, **the auction agency typically sets out a price ceiling and begins soliciting how many bidders** (and as a result, how many MW of capacity) **are willing to come online at the posted price**. The auction agency then gradually reduces the price through successive steps until the total volume of capacity (MW) or of supply (GWh) on offer is equal to the amount targeted by the auction agency (which may or may not be known to auction participants). Under descending clock auctions, bidders typically receive **uniform prices** (see Section 4 below). → These types of auctions are seen to be best in markets where competition is strong and there is quite a lot of information about RE technology costs.

Case Study: Hybrid Auction Design in Brazil

Brazil has recently experimented with a hybrid of the Sealed bid and Descending Price auctions. The country used the descending price auction to target a total volume of capacity slightly larger than its actual target, and then used that price as a price ceiling in a sealed bid auction offered to the remaining participants. The same process can also be run in reverse, with the process beginning with a sealed bid targeting slightly more than the desire volume, followed by a descending clock auction for all remaining participants. These types of auctions are most suitable for jurisdictions with extensive prior experience in running auctions (IRENA and CEM 2015).

3. Technology-Specific vs. Technology-Neutral Auctions

Another key consideration is whether the auctions are designed to be technology neutral, where multiple different kinds of renewable energy projects (wind, solar, hydro, biomass, etc.) compete with one another, or whether they are designed to be technology specific, where strictly the same technologies bid against one another. Thus far, most renewable energy auctions internationally have been technology specific (Soysal 2016).

INSIGHT: Technology-Specific vs. Technology-Neutral Auctions

Different renewable energy technologies have different costs, and rely on different resources (e.g. hydro, geothermal, solar PV, wind, biomass). Due to these different costs and market realities, most jurisdictions around the world including California, Denmark, Germany, and China have opted for technology-specific auctions in order to ensure a level playing field, and in order to more fully harness a jurisdiction's locally available resources. On the other hand, some jurisdictions such as Brazil, California, and the Netherlands have opted to introduce technology-neutral auctions, under the theory that this will yield the most cost-effective outcome for society by targeting only (or at least preferentially) the least-cost resources. However, the power generation costs of various renewable energy technologies have converged over time. Currently, solar PV and onshore wind energy can be procured at similar price levels.

Rather than simply focusing on technology, some jurisdictions such as California have opted to introduce different auctions targeting different generator profiles, including an auction for base-load, peaking, as well as non-peaking technologies (Douglas 2012). Similarly, the government of Colombia is also exploring the development of an auction specifically targeting variable renewable energy resources such as wind and solar power.

Ultimately the decision over whether to introduce technology-specific or technology-neutral auctions has both philosophical or ideological aspects (should least-cost supply govern all procurement decisions, or is technology diversity itself a desirable objective in its own right) as well as concrete, real-world implications. Having purely technology-neutral auctions may produce the lowest contract prices in the short-term, but it may also make it more difficult for the grid operator to integrate all of the additional power from one technology rather than a mix of technologies. Put differently, having a diversity of generation sources in a utility's overall portfolio may itself be a valid strategic objective and may therefore deserve to be reflected in the auction design.

4. Auction Pricing Conditions

Under traditional auction design, policymakers or electric utilities determine a volume of electricity (GWh) or given capacity (MW) that they would like to procure. Instead of fixing the payment levels administratively, as is done under FIT policies, **a competitive auction process is used to solicit bids from different project developers to determine the appropriate price level (in the language of economists this would be an efficient price level**; if the markets were perfect, this would represent the lowest price level consistent with the successful and timely delivery of the product purchased). Thus, auctions provide an effective way to overcoming the fundamental information asymmetry between the auction agency or the utility purchasing the power, and the various bidders who are bidding for contracts.

However, it is important to note that while earlier renewable energy auctions were based largely if not exclusively on price (i.e. price-only auctions), **a growing number of jurisdictions include a range of non-price elements in the overall evaluation process.** This second type of auction is sometimes referred to as a **"multi-criteria" auction** (Ecofys 2016; Held et al. 2014). In this way, policymakers can target specific non-price elements in the evaluation process, such as project siting, environmental impacts, local content, or the technical quality of bids (components used, operations and maintenance plan, etc.). Using multi-criteria can therefore be considered one way to ensure that the auction results in high-quality, locally-accepted project, rather than simply allocating contracts to the proponent using the lowest-cost components.

Further considerations that are important to include in the pricing conditions include **whether the prices offered are fixed in nominal terms, or whether they are indexed to inflation**. Given the critical important of inflation adjustment in projecting cash-flows over a long period of time (10-20 years), this information needs to be published ahead of the auction so that bidders can adjust their bids accordingly. The presence or absence of inflation adjustment, as well as the degree to which contracts are indexed, can play a significant role in the final pricing of the bids received, and of the contracts allocated.

There are broadly **four different pricing methodologies** under auction design. The first two – pay-as-bid and uniform pricing – are the most commonly used methodologies for RE projects:

1. **Pay-as-Bid:** Bidders receive the price that they actually bid, either in the sealed-bid auction, or in a dynamic (descending or ascending price) auction. Most jurisdictions use a pay-as-bid approach.
2. **Uniform Pricing:** Under a uniform pricing auction, all winning bidders receive the "clearing price", which refers to the price of the last winning bid accepted in order to reach the targeted capacity set out by the auctioning agency. In other words, all bidders receive the highest price out of the basket of all the bids that have been accepted, similar to competitive electricity markets, where all participants receive the market clearing price.
3. **Average Pricing:** Certain jurisdictions such as China have opted instead for an average pricing methodology, where the winning bidder is the one to have bid closest to the average of all bids after the highest and lowest bids have been excluded. This was introduced in order to encourage truthful bidding and support price discovery. However, when introduced in

2006, it resulted in bid prices 12% higher than those accepted in the previous auction round (IRENA 2015).

4. **Second Price Pricing:** Under this approach, winning bidders are the ones who bid the best price, but the price paid is not the lowest price, but rather the second lowest. The aim of second price auctions is typically to provide bidders an incentive to bid according to their real costs, rather than simply bidding the lowest price in order to win the contract. These types of auctions are sometimes referred to as "Vickrey" auctions (Vickrey, 1961).

Similar to FIT policies, auctions typically result in the allocation of a long-term power purchase agreement (PPA) to the project proponent. This long-term PPA includes the full range of provisions and protections offered by the legal framework of the country with regards to investments by independent power producers (IPPs).

4.1. What is being bid?

A related pricing question concerns the actual essence of what is being auctioned, and what specific form the price itself takes. In most cases outside of the EU, the price bid represents the full price of the auctioned power ($/MWh), which, in a truly competitive auction, would be approximately equal to the levelized cost of electricity (LCOE) generation from that particular technology in that location. In other words, the payment is equally structured as under a fixed feed-in tariff payment, as currently used in Turkey.

However, due to the policy and regulatory environment in a number of EU states, a number of auctions have been conducted where the subject of the auction is not the full LCOE, but rather the premium above the fluctuating spot market price that bidders believe they will need over the course of the 15- to 20-year agreement, in order to fully recover their costs and provide their targeted return on investment. This is similar to a premium feed-in tariff payment (Couture and Gagnon 2010).

→ Most auctions around the world are based on bids for the full price of the contracted generation, including any other provisions such as currency adjustment, and inflation indexation.

4.2. Ceiling Prices or Price Caps

Price ceilings are used in many countries. They are used to set a maximum price at the outset of the auction beyond which bids will not be accepted. As such, they are particularly important in sealed-bid auctions; under descending clock auctions, the ceiling price is simply used as the starting point and is therefore not as important in modifying bidder behaviour.

The advantage of ceiling prices is that policymakers can avoid excessive bids, which is especially useful in markets with relatively low competition. However, price ceiling can be seen as an orientation point for bidders. In auctions with relatively low competition it was observed that most bidders were offering prices very close to the ceiling price.

Policymakers therefore need to analyse the market conditions precisely before setting ceiling prices. If the price ceiling is too low, potential bidders can be discouraged from participating which may make the auction as a whole less competitive.

A further issue with price ceilings is that they need to be adjusted over time based on market realities: as solar PV costs decline, for instance, price ceilings should be reduced. Similarly, if higher commodity prices push wind turbine costs upward, then the ceilings may need to be adjusted upward.

Price ceilings are found in a wide range of auction designs, including in California, France, Germany, the Netherlands as well as in Peru and Portugal.

5. Pre-qualification criteria

Pre-qualification criteria are typically used to ensure that all bidders participating in the auction have met certain basic standards and requirements. This helps ensure a level playing field between the different participants. Also, having relatively high material pre-qualification requirements, for instance, can help discourage some bidders from making speculative bids on the hopes of winning a contract which they can then re-sell to another (higher) bidder. Rules can also be built into the auction criteria to explicitly forbid speculative bids (e.g. by ensuring that the bidding team is the same as the team awarded the contract).

The table below provides an overview of the different requirements:

1. Access Requirements	2. Financial Prequalification Requirements	3. Material Prequalification Requirements
• a small fee in order to access the bid documents	• Bid deposit	• Technical and commercial viability
• minimum annual turn-over, company size, etc.	• Financial strength	• Grid access and connection
• the track record of the proponent, the technical know-how	• Demonstrated access to finance (bank letters)	• Permits

Note that the pre-qualification criteria must be carefully adapted to the local context, and to policymaker's objectives, as there are many trade-offs involved. For instance, having a high requirement on company size may shut out a range of medium size players, and give preference to larger international players. Recognizing and dealing with these these trade-offs is at the heart of good auction design.

6. Evaluation Criteria

While auctions typically use price as the sole evaluation criterion in selecting bids, a number of jurisdictions rely on a range of non-price criteria. Non-price criteria can be used to target a range of different policymaker objectives (see Section 2 above). For instance, a number of jurisdictions are also beginning to include further selection criteria based, for instance, on the different levels of "local content" included in the project proposals submitted (e.g. production of solar PV modules within the country), as well as environmental or other standards standards, for instance referring to sourcing from sustainable water sources in the case of concentrating solar power (CSP) projects (GIZ 2015).

6.1. Project Selection Process:

The actual selection of projects is an important but frequently overlooked aspect of auction design. Especially in the case of multi-criteria auctions, the representatives that are on the selection committee have considerable discretion in selecting one project or another; this is less of a risk in price-only auctions.

To the extent possible, **the bid evaluation process should be based on clear, point-based criteria**. In order to reduce the risks of corruption in the evaluation process, some countries have established committees for selecting projects, including detailed point-based ranking systems. In California, for instance, the bid evaluation committee has to be composed of representatives from public administration, the regulatory agency, as well as trustable private persons from academia or others. This helps reduce the risk of bias in the project selection process.

A further factor that can improve bid selection results is to design the bid evaluation process (in the case of sealed bid auctions) in such a way that **each individual or representative is responsible for evaluating the same section of each proposal submitted**. In this way, one individual reviews the same section of all proposals (e.g. the technical section of the proposal) and attributes it a point score without seeing the remainder of the project proposal, or knowing who the bidder is. Afterwards, all point scores can be aggregated and the bids can be ranked according to their global point score. This has the advantage of resulting in more objective evaluation processes, while also ensuring greater consistency in the point scores given, as each individual or representative develops expertise in evaluating that particular bid component.

7. Local content and provisions for local industry

A number of auctions around the world now include some form of local content requirements. Local content requirements enable a jurisdiction to give precedence to companies sourcing a greater share of their total project costs (whether PV modules, mounting infrastructure, turbine towers, blades, etc.) from locally-based companies or suppliers. This can be included directly within the selection criteria and can be used to supplement the price bids submitted (see Section 6 above).

A core distinction is whether the local content provisions are mandatory, or voluntary: under **mandatory standards**, developers are required to meet specific minimum thresholds of local content in order to qualify for the bidding round and to be allocated a contract.

Under **voluntary local content provisions**, the evaluation process can be designed to take local content into consideration, providing developers with an incentive to increase their share of local content in order to improve their score, or ranking. Developers can therefore determine to what lengths they wish to go in order to improve the local content of their projects to compete within the market.

For instance, the government of South Africa has included a range of local content and socio-economic aspects into its renewable energy auction framework. These include seven (7) different categories, each with a different weighting within the bid evaluation process: 1) Job creation (25%); 2) Local content expenditure (25%); Local ownership (15%); Local management control (5%); Preferential procurement (10%); Local enterprise development (5%); and Socio-economic development (15%) (Eberhard et al. 2014). Taken together, these local content provisions represent fully 30% of the final bid evaluation (GIZ 2015).

However, it is important to note that there are a number of challenges associated with local content requirements:

1. The lawfulness of local content provisions under WTO rules depends acutely on their design. Local content rules must therefore be designed carefully in order to minimize legal and other risks for developers, as well as to reduce the risks of prolonged delays.
2. Certain areas are difficult to create local content in such as gear boxes for wind turbines. If there is no local supply chain providing these components, introducing a very high local content requirement can introduce significant delays and even make it impossible for certain projects to be realized.
3. Local content requirements can distort bidder behavior and lead to a range of undesirable incentives as developers scramble to try to meet the local content thresholds set out.
4. Local content provisions can also increase the costs of bids received, which can lead to higher costs for the purchasing utilities, and/or ratepayers.

Ultimately, the decision to include local content requirements should not be taken lightly: it requires careful attention to detail, and a set of complementary policies targeting education, training, and local capacity development to ensure that bidders can efficiently and cost-effectively comply with the rules.

8. The Use of Penalties

One of the major problems with auction mechanisms is that bidders “underbid”, i.e. they submit unrealistically low prices in their offers. This means that they are faced with incentives to offer prices that turn out to be too low to enable contracted projects / power delivery to be realized. Fortunately, policymakers have a wide range of tools at their disposal in order to discourage under-bidding, including the targeted use of penalties.

There are **five (5) broad types of penalties** commonly used in renewable energy auctions (Held et al. 2014):

1. A reduction in the contracted power price;
2. A reduction in the contract length over which power is to be purchased;
3. Retention by the auction agency of the bid deposit;
4. Cancellation of the contract;
5. Exclusion of the bidder(s) from subsequent auction rounds.

Penalties are designed to ensure that winning projects will actually be built, and in order to encourage timely completion. In certain cases, penalties are imposed if projects fall significantly behind their stated milestones. For instance, a wide range of jurisdictions including France, the UK, Peru, Brazil, and Denmark all include various forms of penalties for late completion of projects. In extreme cases, regulators in a range of countries including Germany and Brazil reserve the right to cancel the contract entirely if projects are not delivered with a specific time window (typically 1 – 2 years) (IRENA 2015).

However, it is important to factor in the specific ***cause*** of the delay: if the delay is due to the developer's supply chain or management-related issues, then this is a standard part of project development. In contrast, if the problem is due to difficulties obtaining construction permits from the government, or connecting to the grid (for instance), imposing an additional fine or penalty may be considered excessive, and an unnecessary additional economic burden.

Policy makers should keep in mind that penalties put additional risk on auction participants. This might exclude certain project developers (e.g. smaller-scale companies) from participating in the auction process, thereby potentially making the auctions less competitive.

9. Impact of auctions on small and medium-sized developers

Several countries that previously used feed-in tariffs to support renewable energy sources have recently moved to auction-based mechanisms. This includes many EU member states, since the latest EU state aid guidelines for energy are requesting member states to use competitive price finding mechanism as the default support mechanism (EU Commission 2014). Note that exceptions continue to be made for projects below a certain size (see below).

Participating in an auction is riskier for investors than a feed-in tariff based approach, primarily during the project development phase. The move from feed-in tariffs to auctions was therefore frequently criticized by smaller scale actors, including community owned projects, privately financed RE projects and others, because they were not able to handle the risk during the project development phase. Under auctions, the project proponent is not sure whether he will eventually be awarded a contract: as a result, the considerable preparatory work involved in developing a project (resource assessments, land acquisition, obtaining permits, etc.) significantly increases the financial risk for smaller actors.

Policymakers around the world have implemented various design option to reduce the risk for smaller actors (Jacobs, Peinl et al. 2014):

- Small scale projects up to a certain size (e.g. 1 MW) can be excluded from auctions. They are still eligible to receive FIT payments (e.g. Germany and other select EU countries);
- Small scale projects receive financial assistance from a public fund to prepare all auction related documents and material pre-qualifications (e.g. Ontario, Canada);
- Small scale projects have to pay lower (or no) financial pre-qualifications (e.g. Germany and Spain);
- Auction trainings can also be provided to help guide bidders through the various stages and processes required (e.g. Brazil).

10. Additional policy designs

This section considers a few additional policy design elements that may be of interest.

10.1. Establishing designated, pre-approved sites for project development

Certain jurisdictions such as Abu Dhabi, Saudi Arabia, as well as Morocco have begun running auctions where the land on which projects will be developed has been pre-selected by government and local authorities for renewable energy development. From the developers' standpoint, having pre-packaged land can save significant costs in acquiring land while reducing a wide range of other project and construction-related risks. Typically these plots of land have also been equipped with renewable energy resource assessment equipment such as anemometers and insolation monitors in the case of wind and solar power, or devices measuring river flow in the case of hydro power, or government-financed drilling analysis in the case of geothermal projects. This resource data can then be made available to all eligible, registered bidders as part of the fee they pay to access the auction documents (see Section 1.1 above). Moreover, pre-packaged sites can also be pre-screened from the perspective of environmental impact assessments, as well as for transmission interconnection, which can also accelerate the process of project development and reduce the risks of permitting or other delays.

On the other hand, establishing pre-approved sites can be very resource and time-consuming for the national government. Some argue that hundreds of private project developers can do the job of identifying adequate sites more quickly and cost-effectively than the central government. In addition, many developers (particularly local developers) may already have access to land on which they would like to develop their projects, which may create a perception of bias in the auction process. As such, the use of pre-packaged sites should be used in alternation through different auction windows where developers are free to select their own sites. Alternating between pre-packaged and self-selected sites can ensure a more level playing field between different types of developers.

10.2. Frequency of auction rounds

There is a growing consensus from jurisdictions around the world that one of the critical features of auctions is to ensure that there are frequent auction rounds available, set out according to a predictable schedule (Ecofys 2016, IRENA 2015). If auction rounds are infrequent, or unpredictable, it can be much more difficult to developers to allocate resources effectively and many are likely to lose significant resources in maintaining a local presence as they wait for the next auction round to be announced. Such delays can negatively impact the number of bidders that participates, and can significantly increase bid prices, as all developers will have to try to recover some of their lost costs via the auction process. Furthermore, infrequent auction rounds can be extremely difficult for local manufacturers and other suppliers to handle, as their order books typically depend directly on the successful execution of each auction round.

As a general rule, auction agencies should set out a clear and predictable schedule of auction rounds, with the specific volumes that the agency hopes to procure in each round. This helps create more stability and certainty in the market, and can play a significant role in driving economic diversification and job creation by encouraging the growth of a diverse local supply chain.

10.3. Auction trainings

Certain jurisdictions such as Brazil have introduced special “auction trainings” in order to boost the number of bidders participating in the auctions and in order to increase the level of awareness about the policy, its design details, as well as its timelines (Held et al. 2014). Such targeted auction trainings can be a particularly valuable investment for markets seeking to increase local investment and participation, particularly for small and medium-sized actors (see Section 7 above).

11. Policy Hybrids and Policy Alternatives

This final section briefly considers different policy hybrids that have emerged in recent years as well as alternative policy mechanisms to auctions that policymakers in Turkey may wish to consider.

11.1. FIT and Auction Policy Hybrids

Starting in the mid-2000s, China began experimenting with the use of auctions as a mechanism to determine FIT prices. A series of technology-specific auctions were run and based on the results of these auctions, policymakers in China were able to set FIT prices based on current market prices. Due to China’s large surface area and significant regional differences in renewable

energy resource potential, different FIT prices were set for different regions. This represents an innovative hybrid use of both auctions and FITs, leveraging the strengths of both policy instruments.

Other jurisdictions also use auctions for less mature technologies (i.e. where sufficient price data for calculating tariffs administratively is unavailable) while retaining feed-in tariffs for more mature technologies. This is the case in Denmark, were auctions are used for offshore wind energy whereas feed-in tariffs are used for onshore wind (Couture, Jacobs et al. 2015).

11.2. Renewable Energy Standards

Renewable Energy Standards (also referred to as “Renewable Portfolio Standards” or “Renewable Obligations”) are a form of legally binding target for the achievement of a specific share of renewable energy in the overall energy or electricity mix (Kieffer and Couture, 2015). In general, the RES obligation is imposed on electric utilities who are then required to provide annual reports detailing how much eligible renewable electricity they have purchased in that year. Most RES set out incremental, year-over-year targets for renewable energy supply, either set as a percentage (%) of total load served, or as a specific GWh amount. In some cases, Renewable Energy Standards are combined with the use of Renewable Energy Certificates (RECs) which are used to monitor how many MWh of renewable electricity have been generated and purchased by the obligated utility.

Renewable Energy Standards can be used in combination with a wide range of other policy instruments, including auction mechanisms: under this approach, auctions are one procurement mechanism through which new renewable energy capacity can be brought online in order to achieve renewable energy targets.

11.3. Bilateral negotiations

In some jurisdictions, notably in the U.S., China, as well as in parts of Africa, utilities have resorted to bilateral negotiations with specific project developers in order to develop customized contracts for the purchase of power.

Certain jurisdictions around the world such as China allow for some degree of negotiation over specific contract terms before the final contracts are signed (Kreycik et al. 2011, Wigand et al. 2016). However, in other cases, the contracts are designed in advance as a standardized document, are vetted by local and international legal advisors, and are set out as binding documents to all bidders.

Allowing bilateral negotiation over contract terms, or simply procuring power on a bilateral basis from the outset, can be extremely time-consuming and risks resulting in less competitive outcomes from the perspective of the buyer. In addition, the buyer (usually the national utility) is

frequently in the better negotiating position and can therefore exercise considerable influence on the terms of the negotiation with the independent power producer. One of the benefits of auction mechanisms is that they encourage competition from a wide range of different actors, thereby encouraging better price discovery and more competitive terms for the purchasing authority. As such, bilateral negotiations should only be used as a last resort.

12. Concluding Remarks

Drawing on international experiences, it is possible to highlight a few key lessons learned:

- **Start by auctioning more volume or capacity than desired**: it is extremely rare that auctions experience 100% realization rates. In order to improve both the perceived and real success of the auction scheme, procuring slightly more (e.g. 20-50%) than the targeted volume may be appropriate, particularly in the initial auction rounds.
- **Consider both geographic and grid-related aspects**: many of the highest quality sites are occasionally not within reach of transmission and distribution infrastructure. Ensuring that the auction process is well-aligned with existing infrastructure and grid expansion planning is therefore critical.
- **Clear and consistent communication with developers and investors is important to successful auction implementation:** Developers frequently complain of difficulties accessing information about both the timing and the design of the auction process, as well as the lack of detail included in the tender documents. Ensuring clear communication can significant improve participation levels as well as auction results.
- **Include low initial access requirements to ensure broad participation and ensure that the financial pre-qualification requirements are carefully calibrated** in order to deter under-bidding and encourage timely completion.
- **The material pre-qualification requirements should be carefully adjusted** to the unique context, the maturity of the auction process, and technology being auctioned. In addition, the material pre-qualification requirements should be **designed to deter speculative bids** (where bidders bid for a contract which they then hope to subsequently sell on to another, higher, bidder).
- **Avoid boom and bust cycles by instituting a clear, predictable auction schedule**, ideally with at least one auction round per year. This has the further advantage of allowing for important learning effects in subsequent rounds.
- Auctions can be a very effective policy tool for procuring larger projects; they are more difficult to implement to encourage smaller generation projects, including distributed generation. **Auctions should therefore be considered one tool in the toolkit**, and should be used in combination with other policy instruments, including instruments targeting distributed generation (e.g. projects under 5MW).

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