AURES PROJECT

Interactive policy tool
Lessons learnt and best practices on implementing auctions in Europe & beyond

Silvana Tiedemann
Overview

• Auction tools of the AURES’ project
Overview

• Auction tools of the AURES‘ project
• The auction design process in context
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• Auction tools of the AURES project
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Auction tools

http://auresproject.eu/

1. The "About Auctions" overview and glossary
2. The cash flow model simulating single investment appraisals
3. The policy memos
4. The AURES Auction Designer
5. The AURES Auction Academy webinars
Auction tools

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AUCTION TOOLS

1. The "About Auctions" overview and glossary
2. The cash flow model simulating single investment appraisals
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TOOLBOX >>
„About Auctions“ Overview & Glossary

Auction Design Elements
About Auctions“ Overview & Glossary

Auction Design Elements

Auction Criteria

Auction Scope

Auction format

Pricing rules

Remuneration

Other Design elements
„About Auctions“ Overview & Glossary

Auction Design Elements

**Auction Criteria**: price, actor diversity, geographical distribution, domestic industry development, system integration, technical specifications

**Auction Scope**: auction volume, periodicity, target achievement safeguards

**Auction format**: static, dynamic, hybrid

**Pricing rules**: first-price and second-price, uniform-pricing and pay-as-bid, English and Dutch, ascending- and descending-clock

**Remuneration**: duration of contract, FIT, fixed FIP, sliding FIP, investment grant

**Other Design elements**: ceiling prices (reservation prices), material pre-qualifications, financial pre-qualifications, additional penalties, bidder restrictions
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# „About Auctions“ Overview & Glossary

## Auction Design Elements

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<th>Auction Criteria</th>
<th>Related concepts, challenges, and effects</th>
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<td>Bid bonds, bidding strategy</td>
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### Related concepts, challenges, and effects

- Administrative costs, allocative efficiency
- Bid bonds, bidding strategy
- Clearing price
- Deadlines and grace periods, dynamic efficiency
- Economies of scale
- Implicit collusion, incentive compatibility
- Local content
- Multi-project bidders
- NIMBY
- Static efficiency, strategic supply reduction, sunk costs
- Transaction costs
- Underbidding
- Winner’s curse
AURES auction designer
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- Free online tool for policy makers designed by Fraunhofer ISI
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Design your renewable electricity auction

Are you a policy maker interested in allocating support for renewable energy installations via auctions? Do you want to understand which are the most common auctions for renewable energy support? Do you need to know more about which auction design has which effects on auction performance?

The AURES Auction Designer is a free online tool developed by the AURES project. It takes you through the most important questions which need to be answered by anyone trying to set up a successful renewable energy auction. The tool is interactive. Feel free to skip between the questions, try out different options, and play around with different design elements to observe their effects.

However, keep in mind that you will obtain the most useful feedback if you enter realistic answers. Therefore, if you want to prepare your data first, download our info sheet with background information and a list of the questions you will be asked when going through the tool.
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Choose a country

Select

Continue
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<td>FYR Macedonia</td>
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<td>Montenegro</td>
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<td>Netherlands</td>
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<td>Norway</td>
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<td>Installed capacity 2014 [MW]</td>
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<td>-----------------------------</td>
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<tr>
<td>576</td>
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</table>

<table>
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<tr>
<th>NREAP planned capacity 2020 [MW]</th>
<th>Total</th>
<th>BioGas</th>
<th>Biomass</th>
<th>Geothermal</th>
<th>Hydro (large)</th>
<th>Hydro (small)</th>
<th>PV</th>
<th>CSP</th>
<th>Tide/Wave</th>
<th>Onshore wind</th>
<th>Offshore wind</th>
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<tr>
<td>874,8</td>
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<td>162</td>
<td>0</td>
<td>100,8</td>
<td>40</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>500</td>
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<td>500</td>
</tr>
<tr>
<td>Technology</td>
<td>Multiple technology</td>
<td>Biogas (&gt;1 MW)</td>
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<tr>
<td>---------------------</td>
<td>---------------------</td>
<td>----------------</td>
</tr>
</tbody>
</table>

Select a technology for which you want to explore auction designs.

Deployment target [MW] in the next 5 years: 300

Number of auctions during the next 5 years: 5

Volume per auction [MW]: 70

Expected market potential per auction [MW]: 80
Corresponding to the five-year deployment target and the number of auctions you entered above, what is the auction volume (MW) for which you want to allocate support rights through your auction scheme? When setting the auction volume, take into account that often not all winning projects are realised in time. You therefore may want to set the auction volume a bit higher to ensure that you stay on your 5-year trajectory.

The volumes you enter here will determine the demand you create by your auction scheme. The ratio of supply versus demand in your market is crucial to the result of your auction.
How is the auction volume defined?

The auction volume can be defined in terms of capacity (MW), generation (MWh), or budget.

- Auction volume determined in terms of capacity (MW)
- Auction volume determined in terms of generation (MWh)
- Auction volume determined in terms of budget (€)

All of these options have benefits and drawbacks.

In principle, all options can be combined with any remuneration award metric (FIT, FIP, or investment grant), but not all combinations are equally sensible in reality. By far the most common option is the combination of a capacity target volume with a generation-based award metric, usually a FIP. See also the related AURES policy memo.

For the purpose of this questionnaire, we define the auction volume in terms of installed capacities.
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All of these options have benefits and drawbacks.

Auction volume determined in terms of budget (€)

When the target volume of an auction is set in terms of a maximum budget, the auctioned good is usually either expressed in terms of generation or capacity. Bidders therefore either commit to delivering a certain amount of annual electricity generation over the contract duration, or to installing a certain capacity by the end of a given realisation deadline.

A budget target volume clearly sets an upper limit for support expenditures, thus providing security on policy costs for the regulator, and ultimately, electricity consumers. However, with a budget cap it is unclear ex-ante how much capacity will be installed as a result of each auction round. This makes planning in the electricity system more difficult. It also means that the achievement of policy targets (which are usually expressed in terms of installed capacities or shares of total electricity production) is more difficult to monitor. This can mean both under- or overachievement of policy targets. Budget caps are thus less straightforward to be deduced from existing policy targets and must be constantly monitored and readjusted according to technology cost developments.

The Netherlands, Italy, and the UK have used budget-based auction targets. The size of bidding projects was defined in terms of capacity in all cases.

Auction volume determined in terms of budget (€)

When the target volume of an auction is set in terms of a maximum budget, the auctioned good is usually either expressed in terms of generating capacity, Bidders therefore either commit to delivering a certain amount of electricity generation over the contract duration, or to installing a certain amount of capacity at a given realisation deadline.

A budget target volume clearly sets an upper limit for support levels, providing security on policy costs for the regulator, and ultimately keeping the consumers. However, with a budget cap it is unclear ex-ante how much capacity can be installed as a result of each auction round. This makes planning for the system more difficult. It also means that the achievement of the budget target is in terms of installed capacities or share of renewable production is more difficult to monitor. This can mean both underachievement as well as overachievement of policy targets. Budget caps are thus less useful as they can be deduced from existing policy targets and must be constantly readjusted according to technology cost developments.

The Netherlands, Italy, and the UK have used budget-based auctioning schemes, where the target volume was defined in terms of capacity in all cases.
Multi-technology auctions

Which auction format works best for which technology?

Two basic types of auctions are regularly applied to allocate support for renewable energy installations: Single-item auctions and multiple-item auctions.

More on single- versus multiple-item auctions

You chose technology-specific auctions for Onshore Wind. For this technology, several projects are usually required to fulfill the target. Lead times for project development tend to be relatively short, and a large number of potential projects may be in the project pipeline at any given time.

Project sites are usually available in areas with grid infrastructure. Multiple-item auctions are likely to be a suitable choice in this case.

Technology-specific multiple-item auctions are being or have been used in Germany, France, Denmark, Portugal, Italy, and South Africa.

Select your preferred auction format

☐ Single-item
☐ Multiple-item
**Why do you need to know this?**

The characteristics of your bidders and your auctioneer are important, for example when choosing between static and dynamic auction types. In addition, the better you know your bidders, the more reliable your estimate on competition levels will be, and the better you can foresee possible problems with auction performance. You can then address such issues with appropriate design measures.

<table>
<thead>
<tr>
<th>Expected number of bidders</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 5</td>
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<tr>
<td></td>
<td>Between 5 and 50</td>
</tr>
<tr>
<td></td>
<td>More than 50</td>
</tr>
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</table>

| Do bidders (project developers) have good cost information on their projects? | Option: No |

| Is there a risk of implicit collusion? | Option: No |

| Can the auctioneer handle a complex auction mechanism? | Option: No |
Type, pricing, payment

Select your preferred auction type

- Static
- Dynamic
Type, pricing, payment

Select your preferred auction type
- Static
- Dynamic

Select your preferred pricing rule
- Uniform pricing with highest accepted bid
- Uniform pricing with lowest rejected bid
- Pay-as-bid
Type, pricing, payment

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- Static
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- Pay-as-bid

Select your type of support payment
- Feed-in tariff
- Fixed feed-in premium
- Sliding feed-in premium
- Investment grant
**Design elements**
Vary the design elements below to observe their effect on auction performance.

- **Ceiling prices**
  - Read more
  - None
  - Ambitious

- **Material Prequalifications**
  - Read more
  - Lenient
  - Strict

- **Financial Prequalifications**
  - Read more
  - Lenient
  - Strict

- **Penalties**
  - Read more
  - Lenient
  - Strict

- **Bidder restrictions**
  - Read more
  - Loose
  - Tight

**Secondary objectives**
Which criteria, apart from prices, are important to you in your auction?

- **Actor Diversity**
  - Read more
  - No

- **Geographical distribution**
  - Read more
  - Contingents for certain location types

- **Domestic industry development**
  - Read more
  - Pre-qualification criterion regarding jobs

- **System integration**
  - Read more
  - No

- **Technical specifications**
  - Read more
  - No

**Read explanation for dimensions in chart**
**Material prequalification**

Material prequalifications help bidders to gain a better understanding of the costs of their project. You have chosen strict material prequalification, thus the bidders have good information on project costs. Good cost information increases the quality of the bids, and reduces the uncertainty for the bidders. Strict material prequalifications therefore improve realisation rates. When project costs are rather certain, which is implied by strict prequalification requirements, bidders are unlikely to underbid. This may increase overall support costs.

Material prequalifications result in *sunk cost* for bidders. The higher the material prequalification, the higher the sunk costs and the more bidders choose not to participate. While high sunk costs generally only filter out weak bidders, strict material prequalification can make the sunk cost so high that also strong bidders choose not to participate in the auction. This may also contribute to increasing overall support costs. Thus, be aware that strict material pre-qualifications will decrease supply in your auction. Keep in mind that your supply-demand ratio was **1.1:1** earlier and should not decrease much further if you want sufficient competition. Consider decreasing the auction volume if you are unsure whether supply will still be high enough.
Design elements
Vary the design elements below to observe their effect on auction performance.

Secondary objectives
Which criteria, apart from prices, are important to you in your auction?

- Ceiling prices
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- Financial Prequalifications
- Penalties
- Bidder restrictions

- Actor Diversity
- Geographical distribution
- Domestic industry development
- System integration
- Technical specifications

SOCIO-POLITICAL ACCEPTABILITY
- Support cost minimisation
- Awarding of favoured projects

ALLOCATIVE EFFICIENCY
- Awarding lowest cost projects
- Number of participating low cost projects
- Realisation rate
- Participating amounts (MW)

EFFECTIVENESS
- Read explanation for dimensions in chart
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SOCIO-POLITICAL
ACCEPTABILITY

Support cost
minimisation

Awarding of
favoured projects

Realisation rate

EFFECTIVENESS

ALLOCATIVE
EFFICIENCY

Awarding lowest
cost projects

Number of
participating low
cost projects

Participating
amounts (MW)

Read explanation for dimensions in chart
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- Target definition
- Market & regulatory analysis
- Auction design
- Implementation
- Evaluation

Policy goals
(Technology specific) RE targets
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**Target definition**
- Policy goals
- (Technology specific) RE targets

**Market & regulatory analysis**
- Market size
- Market players
- Technology cost
- Project development & operation
- Existing regulations & incentives
- Available grid capacity
- Electricity market

**Auction design**

**Implementation**

**Evaluation**
Market & regulatory analysis

- Market size: level of expected competition sufficient?
- Market players: IPP: international and domestic?, existing or newcomers?
- Technology cost: expected budget claims, ceiling prices based on NREL analysis, value of solar
- Project development phases: duration, risks of project failure, required documentation, costs
- Existing regulations & incentives: land rights; permitting (construction, generation, grid connection, import licenses; LCR; regulation for international companies, financing, …)
- Available grid capacity: administratively site selection?, conflicts with grid development plans by TSO/state-owned utility/local or regional government bodies?
- Electricity market design: Accessibility, risk profile for investors, reliability
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Market & regulatory analysis

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- Target definition
- Market & regulatory analysis
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- Implementation
- Evaluation

**Policy goals**
- (Technology specific) RE targets

**Market size**
- Market players
- Technology cost
- Project development & operation
- Existing regulations & incentives
- Available grid capacity
- Electricity market

**Institutional set-up**
• Who drafts the auction regulation?
• Who drafts the auction regulation?
• Who carries out the auction?
• Who drafts the auction regulation?
• Who carries out the auction?
• Who oversees issuing permits/licenses?
• Who drafts the auction regulation?
• Who carries out the auction?
• Who oversees issuing permits/licenses?
• Who commissions the awarded projects?
• Who drafts the auction regulation?
• Who carries out the auction?
• Who oversees issuing permits/licenses?
• Who commissions the awarded projects?
• Who pays awarded projects (contract off-taker)?
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**Target definition**
- Policy goals (Technology specific) RE targets

**Market & regulatory analysis**
- Market size
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**Auction design**

**Implementation**
- Institutional set-up

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1. **Target definition**
   - Policy goals
   - (Technology specific) RE targets

2. **Market & regulatory analysis**
   - Market size
   - Market players
   - Technology cost
   - Project development & operation
   - Existing regulations & incentives
   - Available grid capacity
   - Electricity market

3. **Auction design**
   - Institutional set-up
   - General design elements
   - Auction procedure
   - Conditions for participation
   - Deadlines and penalties

4. **Implementation**

5. **Evaluation**
✓ Prepare formal regulation, participation documents, and PPAs

✓ Ensure bidders understand the tender documents (transparency and simplicity)

✓ Make a legal review of documents

Drafting of required documents
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✓ Make a legal review of documents
- Publish tender documents well ahead of auction deadline, to give bidders sufficient time to prepare their bids
- Ensure that auction platform works properly
- Evaluate and award bids as quick as possible without compromising on reliability
- Announce results publicly
- Be prepared for legal disputes
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Ensure that auction platform works properly.

Evaluate and award bids as quickly as possible without compromising on reliability.

Announce when to announce winners.

Announce results publicly.

Be prepared for legal disputes.
Implementation

- Drafting of required documents
- Market building
- Auction conduction

- Announcement
- Bid evaluation
- Results

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Implementation

Drafting of required documents

Market building

Auction conduction

Auction

Announcement

Bid evaluation

Results

Contracting

Contract awarded to bidders or monitored by third party

Have provisions for project retirement in place

Be prepared for legal disputes

Implementation

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Market building

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Auction

Announcement

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**Implementation**
- Drafting of required documents
- Market building
- Auction conduction
- Contracting
- Monitoring of realization

**Evaluation**
- Lessons learnt
- Adjustment of auction design
Summary

• AURES identified best-practices for renewable energy auction design
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• Findings are available in accessible formats
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• The process of auction design is as important as the design itself
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