

AURES PROJECT

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

Silvana Tiedemann

ECOFYS

A Navigant Company



AURES

Overview

- Auction tools of the AURES' project

Overview

- Auction tools of the AURES' project
- The auction design process in context

Overview

- **Auction tools of the AURES' project**
- The auction design process in context

Auction tools

<http://auresproject.eu/>

AUCTION TOOLS

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

[TOOLBOX >>](#)

Auction tools

<http://auresproject.eu/>

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„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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Related concepts, challenges, and effects

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Related concepts, challenges, and effects

Bid bonds, bidding strategy

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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

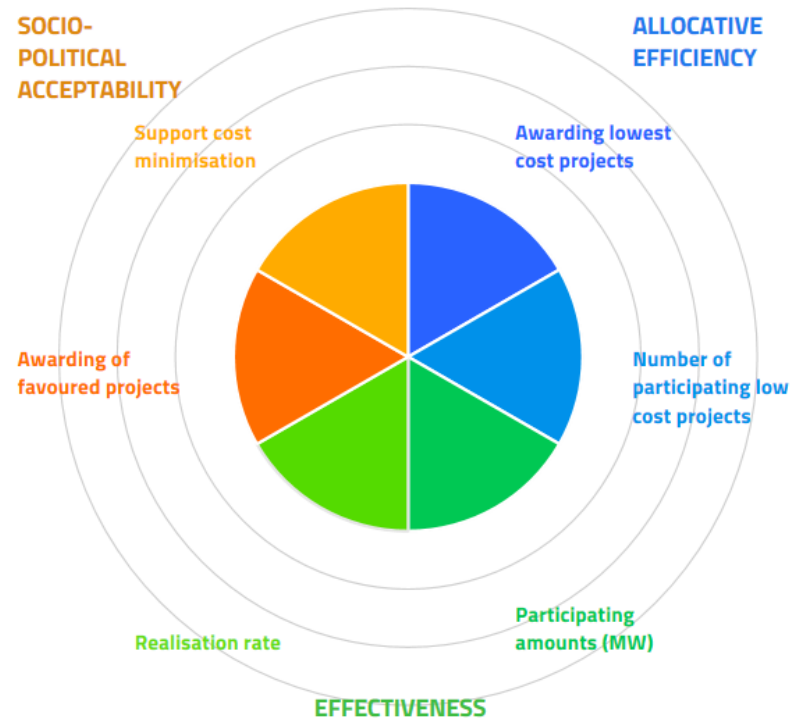
Transaction costs

Underbidding

Winner's curse

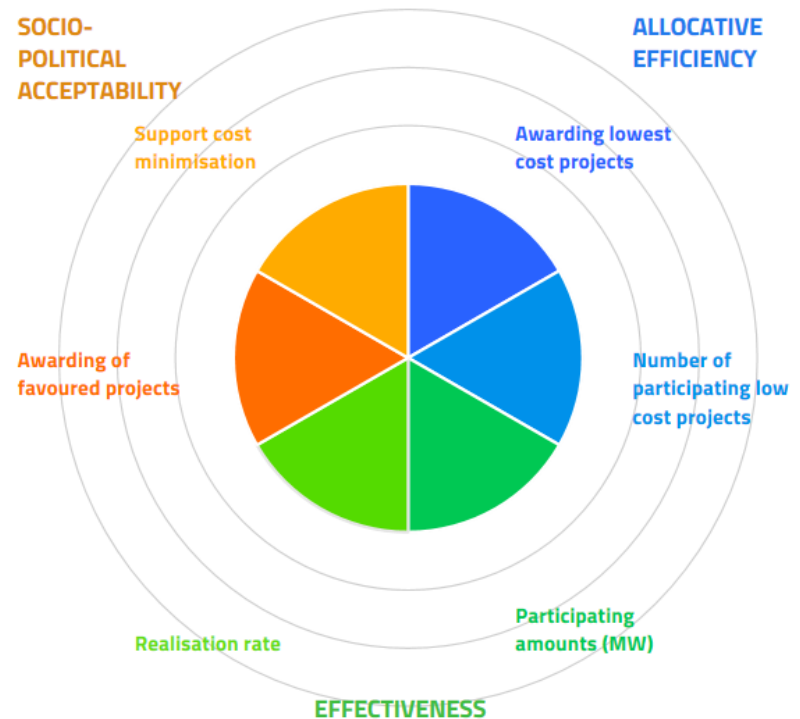
AURES auction designer

AURES auction designer



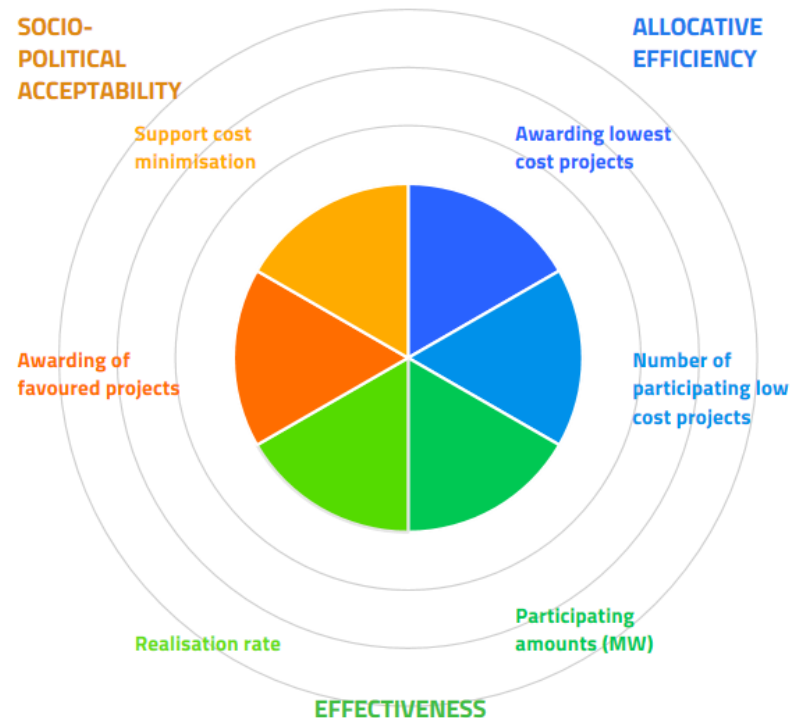
AURES auction designer

- Free online tool for policy makers designed by Fraunhofer ISI



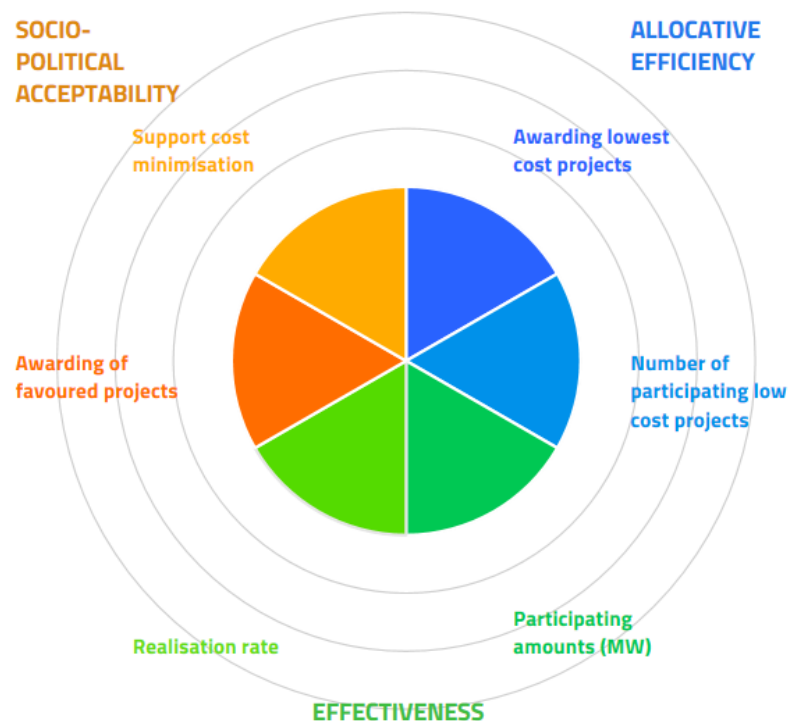
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- Free online tool for policy makers designed by Fraunhofer ISI
- Introduces you to the most important questions of auction design



AURES auction designer

- Free online tool for policy makers designed by Fraunhofer ISI
- Introduces you to the most important questions of auction design
- Tailors AURES' lessons learnt to your usage case





START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN



SUMMARY



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START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN



SUMMARY

SUMMARY: COUNTRY: N/A TECHNOLOGY: N/A SUPPLY/DEMAND RATIO: N/A FORMAT: N/A TYPE: N/A PRICING RULE: N/A PAYMENT: N/A

SHOW ALL

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?

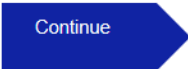
The **AURES Auction Designer** is a free online tool developed by the [AURES project](#). It takes you through the most important questions which need to be answered by anyone trying to set up a successful renewable energy auction. The tool is interactive. Feel free to skip between the questions, try 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.

Choose a country

Select

Continue 



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START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



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- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Iceland
- Lithuania
- Latvia
- FYR Macedonia
- Malta
- Montenegro
- Netherlands
- Norway

observe

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Lithuania



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START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN



SUMMARY

SUMMARY: COUNTRY: LITHUANIA TECHNOLOGY: ONSHORE WIND SUPPLY/DEMAND RATIO: N/A FORMAT: N/A TYPE: N/A PRICING RULE: N/A PAYMENT: N/A

SHOW ALL

Total	Biogas	Biomass	Geo-thermal	Hydro (large)	Hydro (small)	PV	CSP	Tide/Wav	Onshore wind	Offshore wind
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Installed capacity 2014 [MW]

?

576	78	26	0	90	27	69	0	-	288	0
-----	----	----	---	----	----	----	---	---	-----	---

NREAP planned capacity 2020 [MW]

?

874,8	62	162	0	100,8	40	10	0	0	500	0
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START

ESSENTIALS

FORMAT

BIDDERS

TYPE

PRICING

PAYMENT

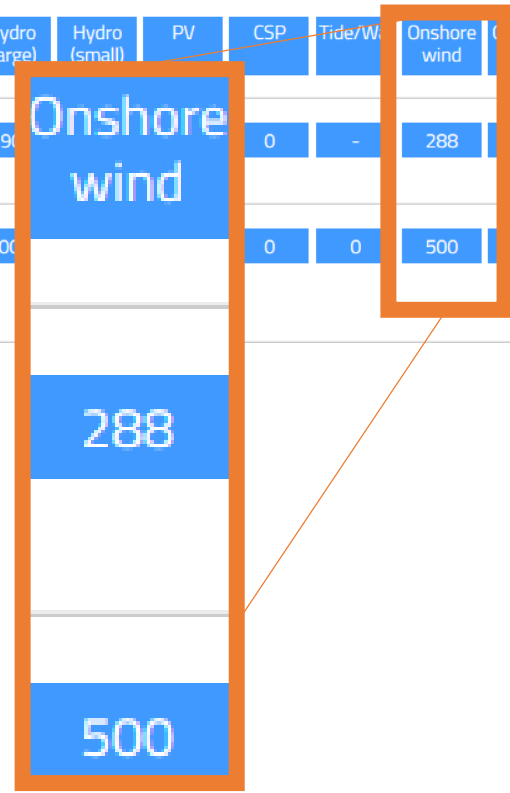
DESIGN

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SHOW ALL

	Total	Biogas	Biomass	Geo-thermal	Hydro (large)	Hydro (small)	PV	CSP	Tide/W	Onshore wind	Offshore wind
Installed capacity 2014 [MW] ?	576	78	26	0	9	9	0	0	-	288	0
NREAP planned capacity 2020 [MW] ?	874,8	62	162	0	100	0	0	0	0	500	0





START



ESSENTIALS



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DESIGN



SUMMARY

Multiple technology	Biogas (> 1 MW)	Biomass (> 1 MW)	Geo-thermal (> 1 MW)	Hydro (> 10 MW)	Hydro (> 1 MW)	PV (> 1 MW)	CSP (> 1 MW)	Tide/Wav (> 1 MW)	Onshore (> 1 MW)	Offshore (> 1 MW)	Small plants (< 1 MW)
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Select a technology for which you want to explore auction designs ?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Deployment target [MW] in the next 5 years ?

Number of auctions during the next 5 years ?

Volume per auction [MW] ?

Read more

Expected market potential per auction [MW] ?

Return to START

Continue to FORMAT



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- 1 START
- 2 ESSENTIALS
- 3 FORMAT
- 4 BIDDERS
- 5 TYPE

Multiple technology Bidding strategy

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

Deployment target [MW] in the next 5 years ?

Number of auctions during the next 5 years ?

Volume per auction [MW] ?

[Read more](#)

Expected market potential per auction [MW] ?

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.

?

Return to START

Continue to FORMAT



START ESSENTIALS FORMAT BIDDERS TYPE

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

Multiple technology

Deployment target [MW] in the next 5 years ?

300

Number of auctions during the next 5 years ?

5

Volume per auction [MW] ?

70

Read more

Expected market potential per auction [MW] ?

80

Return to START

Continue to FORMAT

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.

Close

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.

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.

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aire, we define the auction volume in terms of installed

Close

Continue to
FORMAT

How is the auction volume defined?

The

budget.

Multiple technology

Select a technology for which

All

Auction volume determined in terms of budget (€)

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

A budget target volume clearly sets an upper limit for support provided, providing security on policy costs for the regulator, and ultimately for 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 for the electricity system more difficult. It also means that the achievement of policy targets (which are usually expressed in terms of installed capacities or share of total generation capacity) is more difficult to monitor. This can mean both underachievement and overachievement of policy targets. Budget caps are thus less predictable than capacity targets and must be constantly readjusted according to technology cost developments.

The [Netherlands](#), [Italy](#), and the [UK](#) have used budget-based auctioning. In the [UK](#), the auction volume was defined in terms of capacity in all cases.

Report D4.1-NL, March 2016

Auctions for Renewable Energy Support in the Netherlands: Instruments and lessons learnt





START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN



SUMMARY

SUMMARY: COUNTRY: LITHUANIA TECHNOLOGY: ONSHORE WIND SUPPLY/DEMAND RATIO: 1.1:1 FORMAT: MULTIPLE-ITEM TYPE: N/A PRICING RULE: N/A PAYMENT: N/A

SHOW ALL

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 fulfil 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



START



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SHOW ALL

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.

Expected number of bidders ?

- Less than 5
Between 5 and 50 (selected)
More than 50

Do bidders (project developers) have good cost information on their projects? ?

No [dropdown arrow]

Is there a risk of implicit collusion? ?

No [dropdown arrow]

Can the auctioneer handle a complex auction mechanism? ?

No [dropdown arrow]

Return to FORMAT

Continue to TYPE

Type, pricing, payment

- 1 START
- 2 ESSENTIALS
- 3 FORMAT
- 4 BIDDERS
- 5 TYPE
- 6 PRICING
- 7 PAYMENT
- 8 DESIGN
- 9 SUMMARY

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



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

Select your type of support payment

- Feed-in tariff
- Fixed feed-in premium
- Sliding feed-in premium
- Investment grant



START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN



SUMMARY



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START ESSENTIALS FORMAT BIDDERS TYPE PRICING PAYMENT DESIGN SUMMARY

Design elements

Vary the design elements below to observe their effect on auction performance.

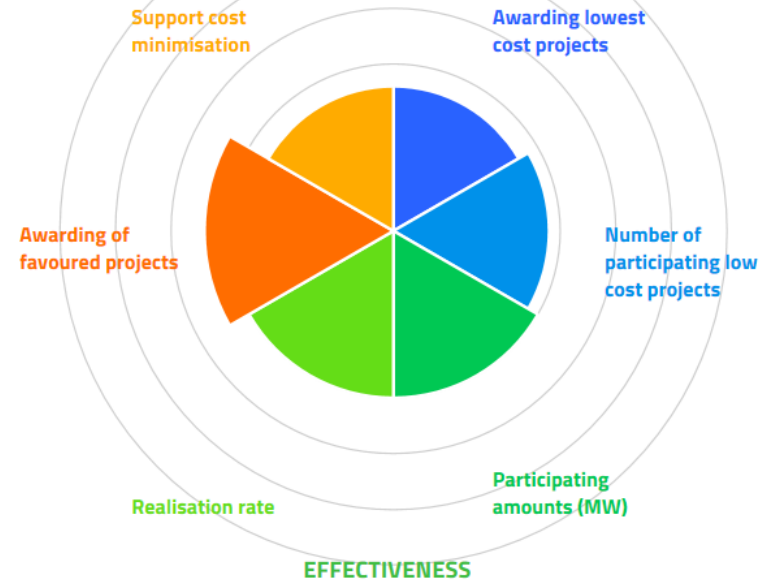
<p>Ceiling prices Read more</p> <p>none <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ambitious</p>	<p>Actor Diversity Read more</p> <p>No <input type="checkbox"/></p>
<p>Material Prequalifications Read more</p> <p>lenient <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> strict</p>	<p>Geographical distribution Read more</p> <p>Contingents for certain location types c <input type="checkbox"/></p>
<p>Financial Prequalifications Read more</p> <p>lenient <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> strict</p>	<p>Domestic industry development Read more</p> <p>Pre-qualification criterion regarding job <input type="checkbox"/></p>
<p>Penalties Read more</p> <p>lenient <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> strict</p>	<p>System integration Read more</p> <p>No <input type="checkbox"/></p>
<p>Bidder restrictions Read more</p> <p>loose <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> tight</p>	<p>Technical specifications Read more</p> <p>No <input type="checkbox"/></p>

Secondary objectives

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

SOCIO-POLITICAL ACCEPTABILITY

ALLOCATIVE EFFICIENCY



[Read explanation for dimensions in chart](#)



START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN

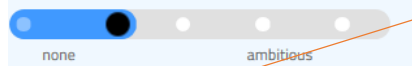


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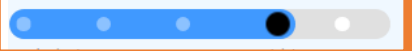
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Ceiling prices Read more



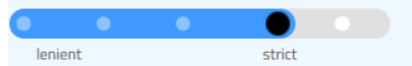
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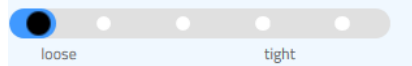
Financial Prequalifications Read more



Penalties Read more



Bidder restrictions Read more



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.

LOCATIVE
EFFICIENCY

number of
participating low
t projects



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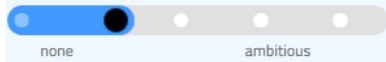
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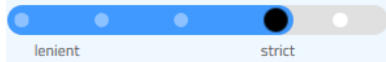
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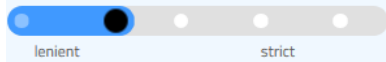
Ceiling prices [Read more](#)



Material Prequalifications [Read more](#)



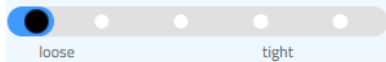
Financial Prequalifications [Read more](#)



Penalties [Read more](#)



Bidder restrictions [Read more](#)



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 c

Domestic industry development [Read more](#)

Pre-qualification criterion regarding job

System integration [Read more](#)

No

Technical specifications [Read more](#)

No

SOCIO-POLITICAL ACCEPTABILITY

ALLOCATIVE EFFICIENCY

Support cost minimisation

Awarding lowest cost projects

Awarding of favoured projects

Number of participating low cost projects

Realisation rate

Participating amounts (MW)

EFFECTIVENESS

[Read explanation for dimensions in chart](#)

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

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Contingents for certain location types c

Domestic industry development [Read more](#)


Pre-qualification criterion regarding job

System integration [Read more](#)

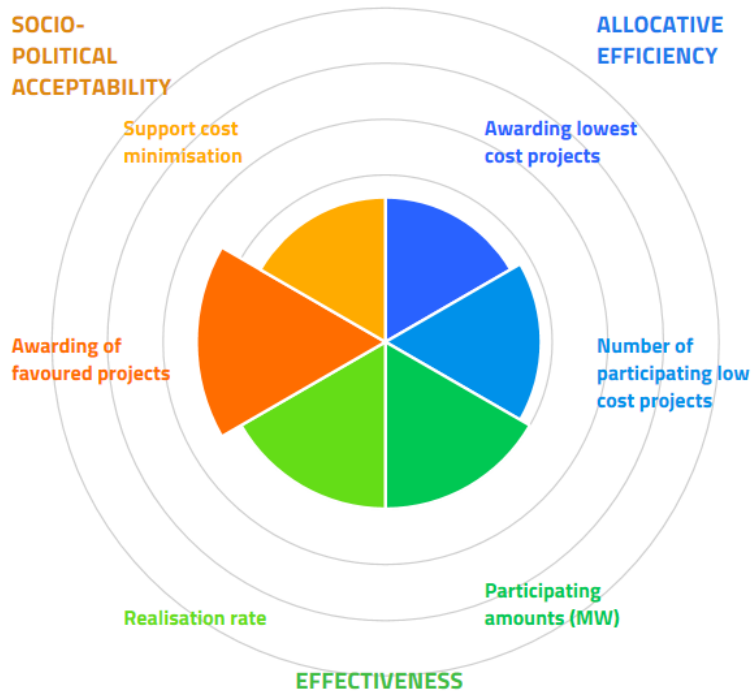
No

Technical specifications [Read more](#)

No

Penalties  [Read more](#)

lenient strict



[Read explanation for dimensions in chart](#)



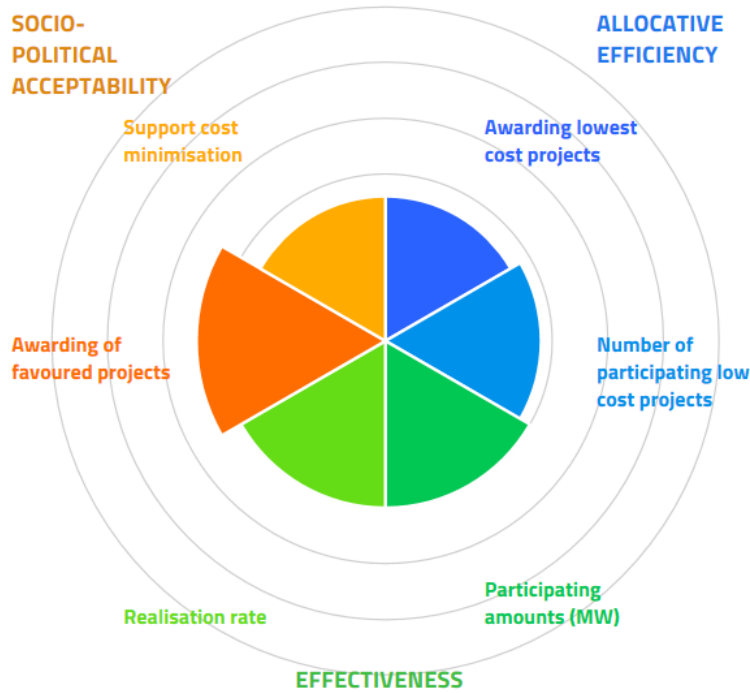
START ESSENTIALS FORMAT BIDDERS TYPE PRICING PAYMENT DESIGN SUMMARY

Penalties [Read more](#)

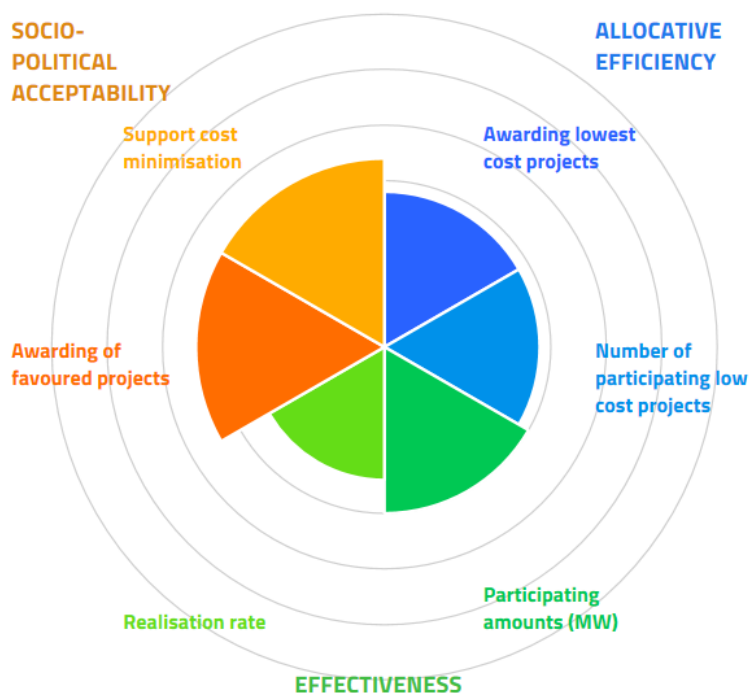
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START



ESSENTIALS



FORMAT



BIDDERS



TYPE



PRICING



PAYMENT



DESIGN



SUMMARY

- Where to find:

<http://auresproject.eu/auctiondesigner>

- Where to find:
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- When to use:
 - To get an overview on design choices you will face
 - To get a feel for the implications of different design options which are discussed in your country

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- When to use:
 - To get an overview on design choices you will face
 - To get a feel for the implications of different design options which are discussed in your country
- When **not** to use:
 - Don't mistake the Auction Designer's for a silver bullet delivering a ready-made auction design

Overview

- Auction tools of the AURES' project
- **The auction design process in context**

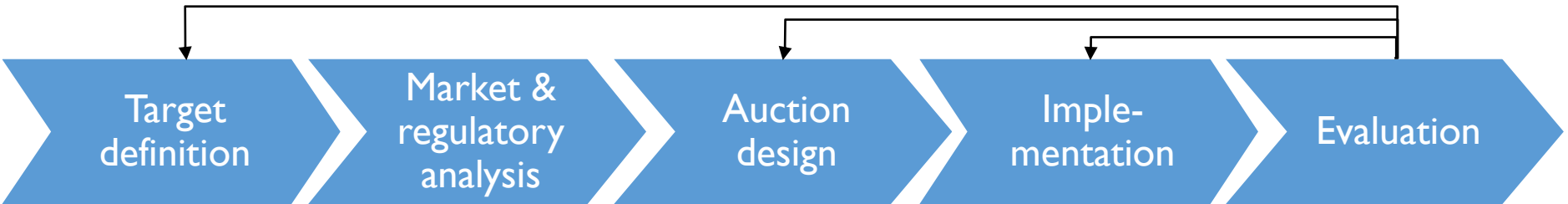
The auction design itself is only a small part of the auction design process



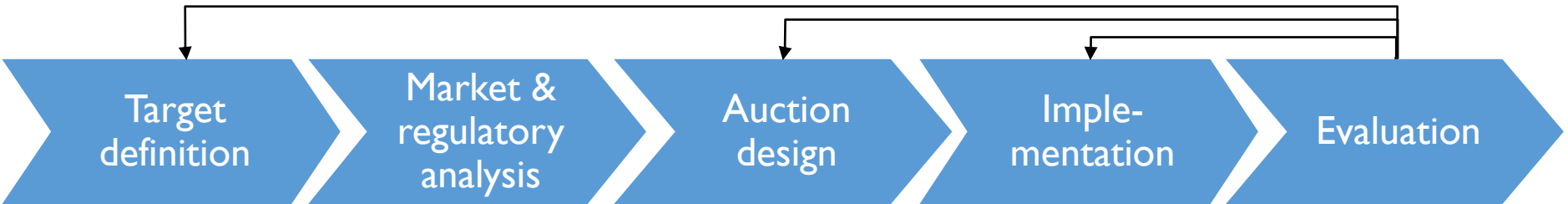
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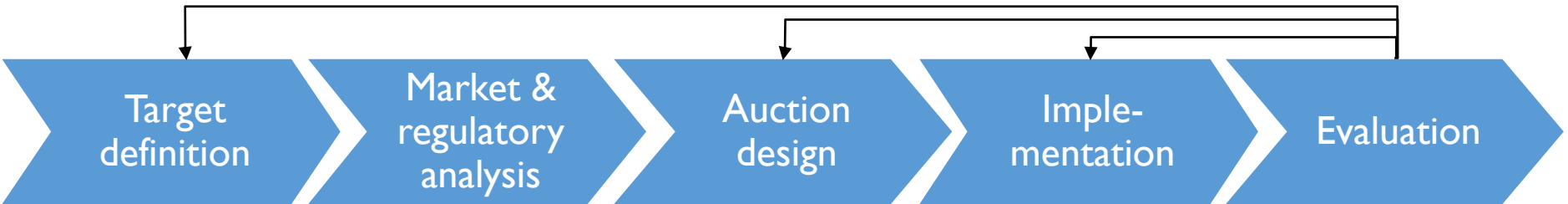


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Policy goals
(Technology specific) RE targets

The auction design itself is only a small part of the auction design process



Policy goals
(Technology specific) RE targets

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

Market &
regulatory
analysis

Market & regulatory analysis

- **Market size:** level of expected competition sufficient?

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Market & regulatory analysis

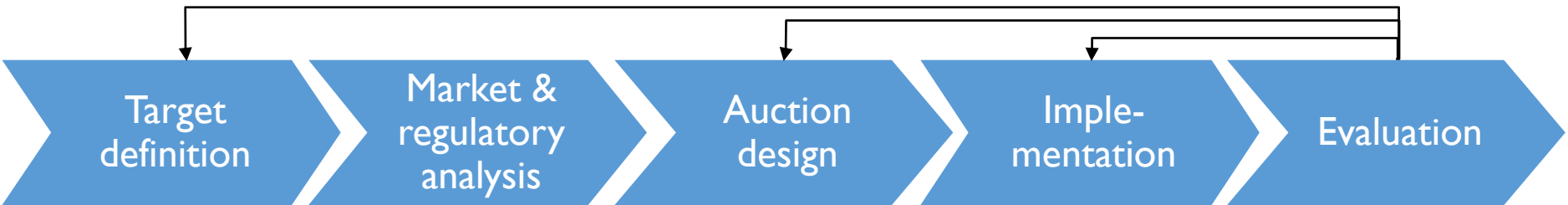
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- **Electricity market design:** Accessibility, risk profile for investors, reliability

The auction design itself is only a small part of the auction design process



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?

Auction design

- Who drafts the auction regulation?
- Who carries out the auction?

Auction design

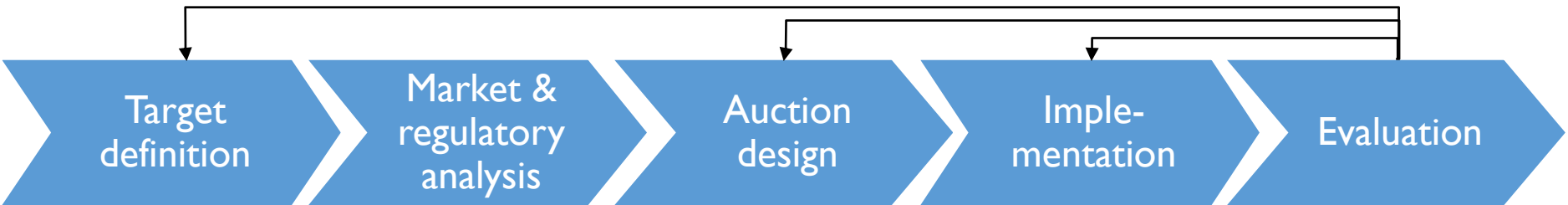
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- Who oversees issuing permits/licenses?
- Who commissions the awarded projects?
- Who pays awarded projects (contract off-taker)?

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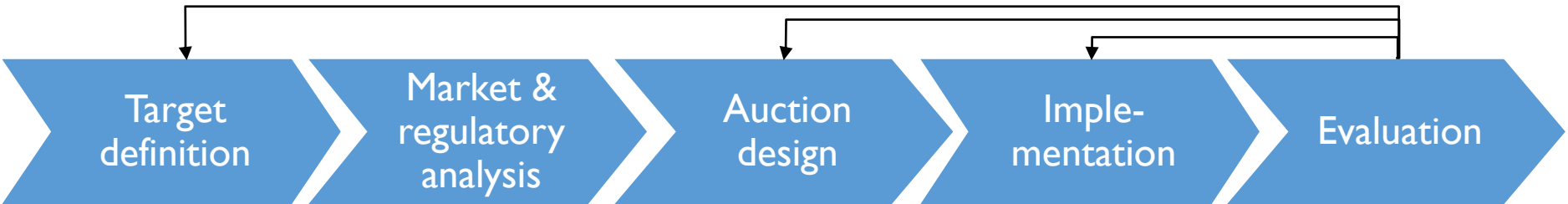


Policy goals
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Market size
Market players
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Market players
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Institutional set-up
General design elements
Auction procedure
Conditions for participation
Deadlines and penalties

Imple-
mentation

Drafting of
required
documents

Imple-
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- ✓ Prepare formal regulation, participation documents, and PPAs

Implementation

Drafting of required documents

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

Implementation

Drafting of required documents

- ✓ Prepare formal regulation, participation documents, and PPAs
- ✓ Ensure bidders understand the tender documents (transparency and simplicity)
- ✓ Make a legal review of documents

Implementation

Drafting of
required
documents

Market
building

Auction conduction

Auction

Announce-
ment

Bid
evaluation

Results

Implementation

Drafting of
required
documents

Market
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Auction conduction

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ment

Bid
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Results

- ✓ 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 quickly as possible without compromising on reliability
- ✓ Announce when to announce winners
- ✓ Announce results publicly
- ✓ Be prepared for legal disputes

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Results

Contracting

Implementation

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Contracting

- ✓ Contract awarded bidders or monitor contracting by third party

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Auction

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Bid
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Results

Contracting

- ✓ Contract awarded bidders or monitor contracting by third party
- ✓ Have provisions for project retirement in place

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Drafting of
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documents

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Auction conduction

Auction

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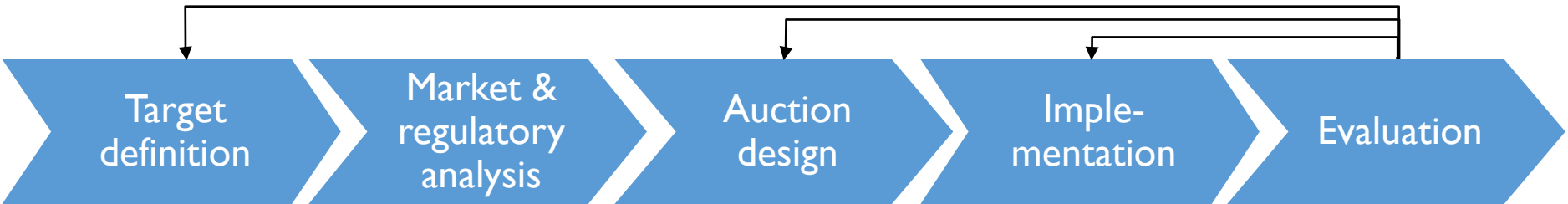
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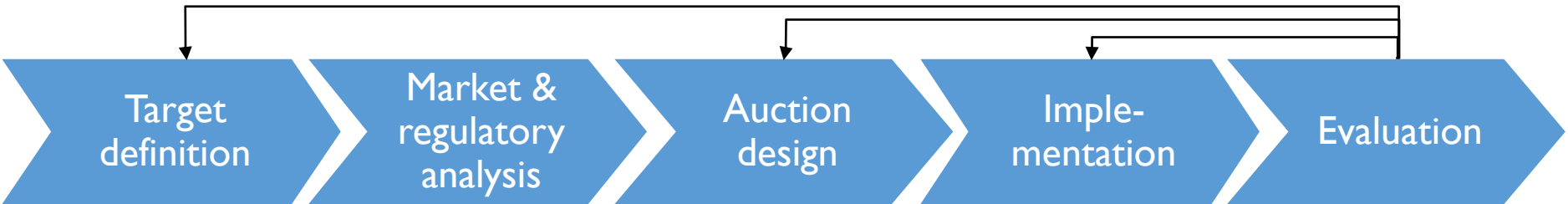
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Drafting of required documents
Market building
Auction conduction
Contracting
Monitoring of realization

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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 General design elements Auction procedure Conditions for participation Deadlines and penalties	Drafting of required documents Market building Auction conduction Contracting Monitoring of realization	Lessons learnt Adjustment of auction design
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Summary

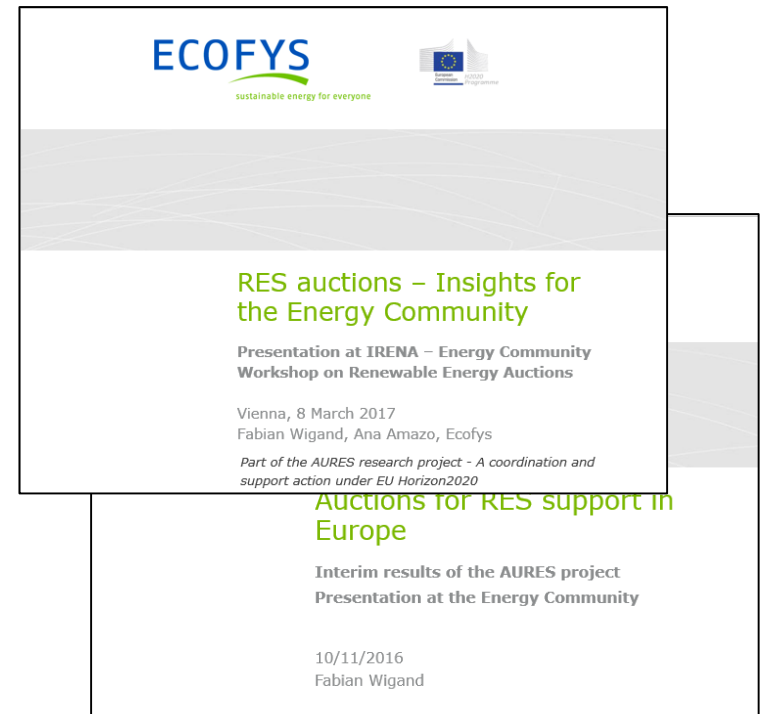
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Summary

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- Findings are available in accessible formats

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Summary

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



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