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RES auctions – Insights for the Energy Community

Presentation at IRENA – Energy Community Workshop on Renewable Energy Auctions

Vienna, 8 March 2017

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Part of the AURES research project - A coordination and support action under EU Horizon2020

AURES
AUctions for Renewable Energy Support

- A coordination and support action under EU Horizon2020 (coordinator: DTU)
- Three-year project: Jan 2015 to Dec 2017
- Background: New EC State Aid Guidelines: ”competitive elements” in RES support
- Two main objectives
  1. New insights regarding auction design and identification of ‘best practices’
  2. Knowledge building and facilitation of cooperation amongst policy makers, market participants and other stakeholders
- Examples of questions to be answered
  - Which auction types and designs are specifically suitable for RES-E support?
  - What effects (desired or undesired) do different design options have under different market conditions?

Agenda

1. **Auctions for RES-E support**

2. Insights on auction implementation for Energy Community countries
   - Making permitting procedures more auction-compatible
   - Tackling off-taker risk
   - Tailoring auctions to various policy goals
   - Considering system integration issues

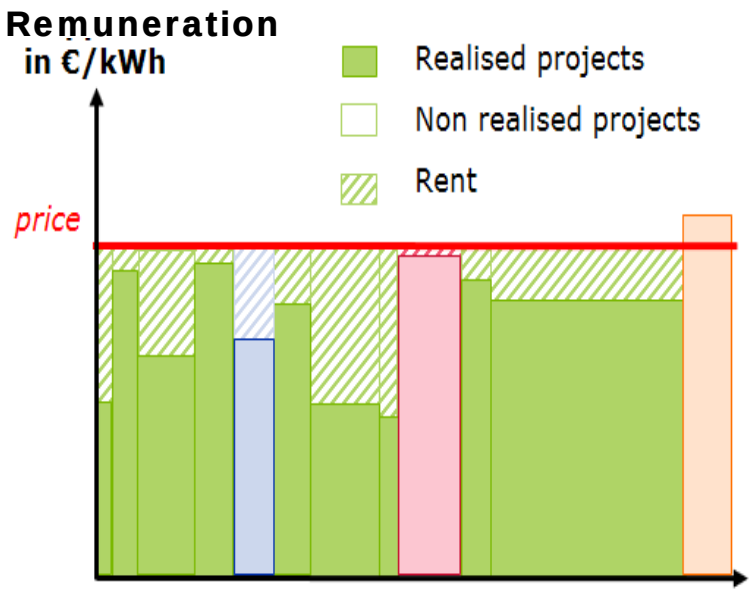
3. Demonstration of online policy tool on auction design (beta)

4. Experiment

In an auction the government sets the volume, but the market sets the price

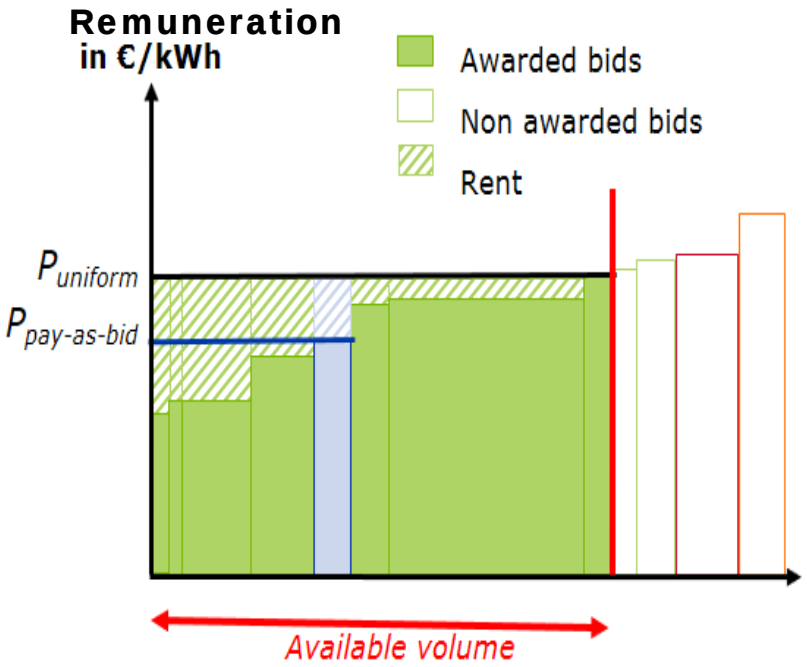
Administratively-set support (e.g. FIT/FIP) for RES-E:

„Government sets price, market determines volume“



Support (e.g. FIT/FIP) for RES-E determined via auctions:

„Government sets volume, market determines price“

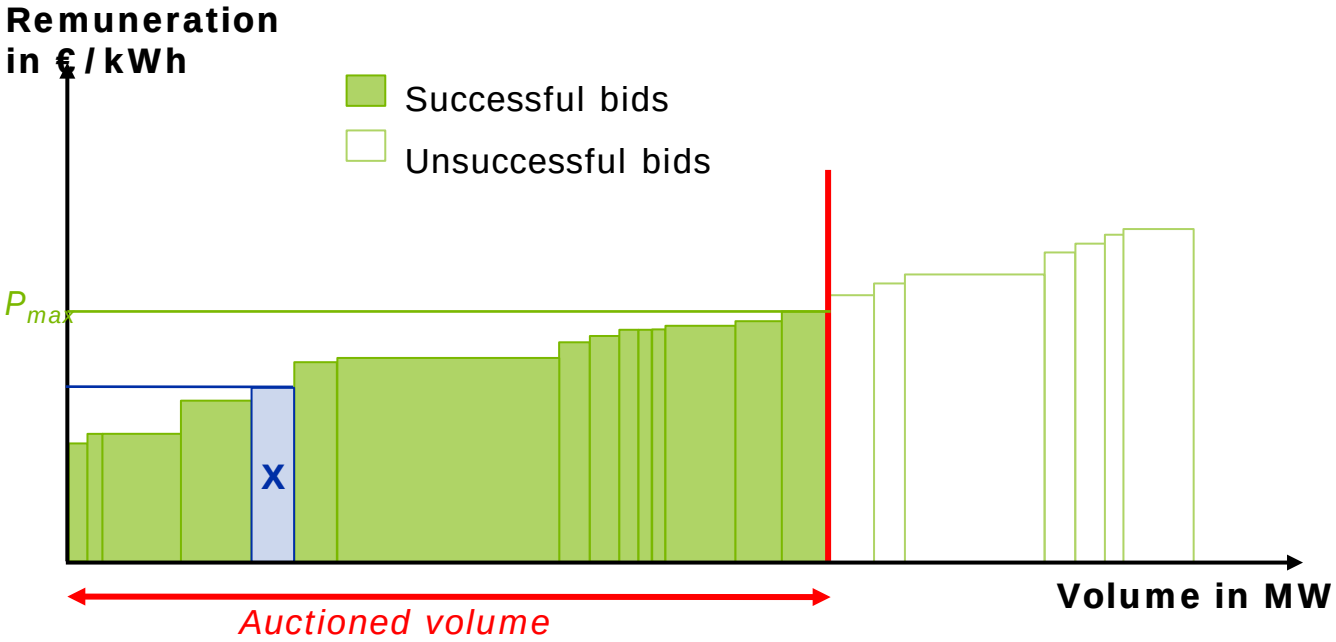


Auctions can ensure efficient allocation of support payments, if there is sufficient competition

When is an auction competitive?

- Supply from the market exceeds auction volume
- Eligible bids exceed auction volume
- Sufficient number of actors in the market

→ *Auctions need to be tailored to market environment*



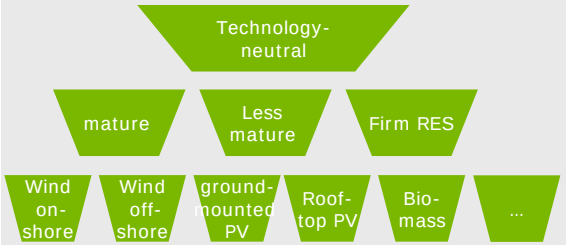
A wide range of auction design parameters can address the local conditions and priorities

What to reflect on when designing an RES-E auctions?

Auctioned volume and remunerated item (e.g. kWh or KW)

Mutli vs. single-item auction

Technology bands



Timing of the auction (early/late)

Qualification requirements and bid bonds

De-Minimis-Rules

Realisation period

Volume

Penalties / Seller‘s liabilities

Bidding procedure: Dynamic vs. static

Periodicity: rounds per year

Evaluation / winner selection criteria:
Price-only vs. multi-criteria Definition of criteria for multi-criteria

Ceiling price
Methodology Value

Pricing rule: **payment to the winner**

Small markets (i.e. small volume that could be auctioned) with large project pipelines raise difficulty of avoiding market concentration and collusion

Good auction design is important - negative auction outcomes in past can be explained design flaws

Low supply (other examples: IT)

Off-shore wind auction, Anholt (2009/10)

> High delay penalties + strict schedule + opportunities abroad → only one bid submitted → high prices

Low levels of eligibility

Solar PV, 100-250 kW (2012)

> Unclear pre-qualification requirements + inexperienced bidders → only 60% of bids eligible

Risk of low realisation

Onshore wind and biomass (2016)

> Only one round (uncertainty over schedule) + low prequalification + 10 GW in the pipeline + uniform pricing → zero support levels → risk of non-realisation

AURES recommendation for the new EU RES Directive: leave flexibility to States but set some guidelines

Elements applied in most EU Member States	AURES design recommendations to the new EU RE Directive
Technology-specific auctions	Leave flexibility to use technology-specific schemes
Volume caps	Volume caps preferred to budget caps (but depends on political preference)
Auctions at least every year	Higher frequency avoids disruption, but do not prescribe frequency
Static auctions, mostly pay-as-bid	Do not prescribe specific auction type
Ceiling prices	Require ceiling prices
Single or multi-criteria auctions	Price should be preferred selection criterion, but secondary criteria allowed if well founded
Financial and material; penalties	Require both pre-qualification requirements and penalties; specific design left to MS
Reliability of schedule	Reliable auction schedule (short and long term, appropriate monitoring)

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Permitting regulation and auction design are interlinked

Dealing with a **large pipeline of pre-developed projects** in Balkans (e.g. Serbia and BiH) needs to be take into account when designing an auction scheme

- When FIT/FIP quota has been filled, permitting authorities stopped issuing permits
  - Stopped development of new projects and could **lower competition** (in case these permits are part of the pre-qualification requirements)

- Permit as a document giving its holder the right to build a project (instead of a secured "quota"), would **allow new projects to participate in an auction**, **potentially increasing competition**

- Authorities can also define specific sites where projects are to be built
  - **Single-item** (site-specific) auctions have been used for large technologies (e.g offshore wind) or to align grid and RES expansion

Allowing more projects to obtain a building permit can foster auction participation

- Option: Competent authority issues more permits to foster more auction participation to increase competition among bidders

  - Expiration dates for permits are defined. Expired permits are cancelled in order to free up more potential project areas

  - Valid (i.e. non-expired) permit as a pre-qualification requirement.

  - Caveat: highly complex permitting system can increase sunk costs incurred in by bidders, potentially deterring participation
    - Simplified permitting system can lower these costs.
      - Ex.: "one-stop-shop“ authority.
        - Planned/implemented in several Energy Community countries.

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Contracts signed via auctions can reduce off-taker risk for project developers and delivery risk of governments

- Auction winners sign a contract with the state or a company

- In case of non-compliance by any of the parties, there is a **possibility to execute financial guarantees and/or sue**
  - Caveat: Setting financial guarantees too high can also increase risk for bidders

- An **auction schedule** with known capacity or energy volumes **increases investor certainty**

- **Increased transparency** in terms of how support is allocated
  - Prequalification requirements-requirements are known published
  - Assessment of bids published
  - Auctioned volume clearly defined and comparable (homogeneous)

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Various policy goals can inform auction design but trade-offs need to be balanced

- **Effectiveness**
  - Volume control and target fulfilment

- **Efficiency**
  - Competitive setting of support level through sufficient levels competition, low transaction costs and minimization of other risks

Further policy goals:

- **Regional distribution** of awarded projects and system integration
  - Ex.: regional quota or reference yield models
- **Local socio-economic impact**
  - Ex.: specifications for a minimum percentage of locally hired workers, or requirement that certain components or services to be domestically
- Access for **small actors** to the auction
  - Ex.: special conditions within the auction to facilitate their participation

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System integration is part of the bid evaluation parameters in Mexico's and California's auction scheme

System integration issues in Energy Community countries could also be **addressed within** an auction scheme

International experiences: system integration as bid evaluation parameters

> Mexico 
  - Price adjustment factors reflect
    - Local value of energy
  - System restrictions
    - Capacity and energy quotas defined for different areas

> California 
  - Technology bands according to load profile (i.e. peaking, non-peaking, baseload)
  - Price adjustment factors reflect
    - Time of delivery
    - Resource adequacy benefits
    - Regional differences

Germany intends to reflect system integration costs in its technology-neutral auctions

Design elements proposed for the technology-neutral auction pilot 2018-20, to reflect grid and system integration costs:

> **Transmission grid**: **grid extension area** with quota in auction limits the RES capacity additions in Northern Germany

> **Distribution grid: distribution grid factor** with malus applied to bids from areas where additional RES capacity would further increase grid expansion

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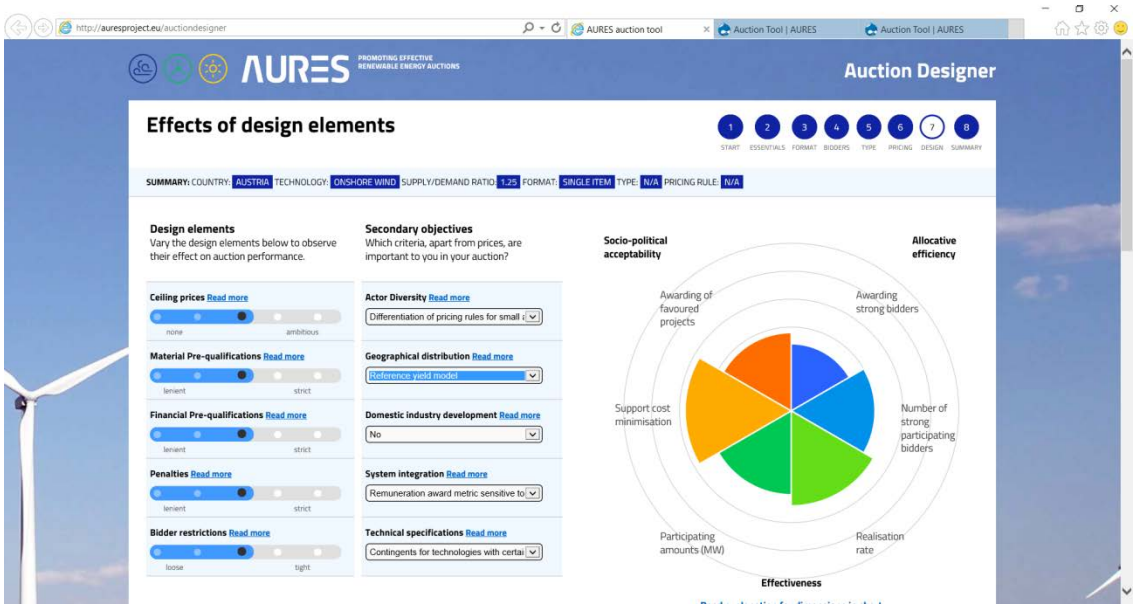
3. **Demonstration of online policy tool on auction design (beta)**

4. Experiment

AURES Auction Designer

- Interactive online policy support tool
- Target group: Policy makers tasked with designing auctions; other RES-related stakeholders
- Coming spring/summer 2017
- Beta version available now: www.auresproject.eu/auctiondesigner



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4. **Experiment**

Experiment – Introduction to the problem of sunk costs

1. Procurement auction for similar projects.

   Clock auction ("English auction"): price decreases continuously, auction ends when only one bidder is left. Bid price is given by the last price.

2. Each bidder will receive his individual project costs on a piece of paper. Bidders' project costs are different.

3. Individual project costs consist of: already incurred costs (before the auction) and the remaining costs, which only accrue to auction winners.

4. Please write your bid on a piece of paper.

5. Start of the auction

Based on Takon by Ehrhart, 2016

Experiment – Introduction to the problem of sunk costs

- Definition
  - Losses caused by sunk costs not only affect auction losers, but also the auction winner of an auction
- Example
  - Costs associated to project pre-development up to obtaining a permit
- Bidding behavior
  - Optimal bidding strategy is based only on residual costs and, if necessary, deducts sunk costs
- Consequences due to sunk costs
  - Lower acceptance or non-participation by bidders
  - Risk of non-realization

Based on Takon by Ehrhart, 2016

Experiment – Introduction to the problem of the winner‘s curse

1. Procurement auction for a project

   Auction format: Simultaneous second prize auction: Concealed bidding, award price is given by the second lowest bid.

2. The bidder has difficulties to estimates his costs (symbolized by a can with cash). Each bidder estimates the amount of the cash in the can and writes it down on a piece of paper. Cover the piece of paper.

3. Each bidder decides on a bid price and writes it on a piece of paper.

4. Announcement and evaluation of the results

Based on Takon by Ehrhart, 2016

Experiment – Introduction to the problem of the winner‘s curse

- Definition
  - Auction bid price is less than the actual value of the good, which will result in a loss for the auction winner
- Example
  - Excessive yield or underestimated costs
- Impact on bidders
  - Often bidders tend to estimate the costs relatively well
  - If bidders are guided by their cost estimates in their bid strategy, the bidder who underestimates costs wins the auction
- Adequate bidding behavior
  - Upward adjustment of the cost estimation in case of having a winning bid
  - Adjustment of the bid where possible

Based on Takon by Ehrhart, 2016

Thank you. Questions?

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Auctions have also been used for demand-side management and energy efficiency

- RES-targets achieved? Then auctions could be used to allocate support to the projects offering other services

- Examples:
  - Germany's pilot project STEP up!:
    - Auction scheme awards contracts to bids for measures with the best cost-benefit ratio (euro per saved kWh).
  - UK's Electricity Demand Reduction (EDR) pilot:
    - Focus: energy efficiency measures to reduce the amount of electricity they would demand at peak times (4 – 8pm) during the winter period (November – February).
  - California's Demand Response Auction Mechanism (DRAM)
    - There is no capacity market in California.
    - Utilities offer DRAM to incentivize distributed energy resources to provide similar product characteristics to capacity.