The future of auctions in the energy system

Auctions beyond renewable electricity

AURES II webinar, 15 December 2021

Auctions for heating and cooling – a promising instrument?

Heating and cooling in the energy sector

- About 50% of EU energy consumption for heating (and cooling)
- Diverse usage and actors:
  - buildings: space and water heating (192.5 Mtoe, 79% of final energy use)
  - industry: space and process heating (193.6 Mtoe, 70.6% of final energy use)
- Decarbonizing heating implies:
  - expansion of direct (and indirect) electrification, mainly using heat pumps
  - expansion of renewable energy usage (geothermal, solarthermal, (biomass))
  - expansion of district heating (and cooling) systems

→ **Where could auctions play a role?**

Expansion of DHC and increase of RES and heat pumps in DHC

- Infrastructure:
  - New DHC grids
  - Expansion and modernization of existing DHC grids
- Generation:
  - New RES plants and heat pumps in existing grids
  - New CHP plants
- Combined auction for infrastructure and generation:
  - New grids with RES, heat pumps (and/or CHP/waste heat)
  - Expansion and modernization of existing grids with RES, heat pumps (and/or CHP/waste heat)

Expansion of DHC and increase of RES and heat pumps in DHC

- **Infrastructure:**
  - **New DHC grids**
  - **Expansion and modernization of existing DHC grids**

Possible role of auctions:

- Tenders for specific new grids are standard procurement auctions→ single-unit auctions (e.g. in Hamburg Speicherstadt)
- Additional potential:
  - multi-unit auctions for new grids combined with investment support
  - participants could be municipalities/communities/grid operators
  - prequalification criteria to enable deep decarbonization

Expansion of DHC and increase of RES and heat pumps in DHC

- **Generation:**
  - **New RES plants and heat pumps in existing grids**
  - **New CHP plants**

Possible role of auctions:

- Auctions for new CHP plants already in place (Germany, Slovenia, Poland) → country-wide multi-unit auctions
- Auctions for new RES plants and heat pumps (in specific grids) in place (in Estonia and Lithuania)
- Additional potential:
  - Auctions for RES plants and heat pumps (multi-unit)

Expansion of DHC and increase of RES and heat pumps in DHC

- **Combined auction for infrastructure and generation:**
  - **New grids with RES, heat pumps (and/or CHP/waste heat)**
  - **Expansion and modernization of existing grids with RES, heat pumps (and/or CHP/waste heat)**

Possible role of auctions:

- Auction for CHP support if DHC grid fulfills certain RES requirements in place in Germany (multi-unit auction)
- Additional potential:
  - Auctions for investment or operating support for new grids or grid expansion/modernization and required RES plants/heat pumps (multi-unit or single-unit auctions)

Expansion of DHC and increase of RES and heat pumps in DHC

- Experience so far limited:
  - CHP auctions, auctions for individual grids and plants
- Promising potential for auctions
- But: competition between different sites might be difficult due to different framework conditions (e.g. heat density/ generation potential) in each individual DHC grid
- Auctions for individual RES or heat pumps require third party access
- No assessment (yet) whether auctions perform better than other instruments to allocate support

Expansion of individual renewables and heat pumps in buildings/households

- **Industry:**
  - **New decentral heating appliances**

- Possible role of auctions:
  - Country-wide multi-unit auctions
  - operational support might be necessary due to differences in operational costs for some heating technologies compared to conventional technologies
  - Possibly distinction between different technologies and sectors necessary
  - Can there be sufficient competition?

Expansion of individual renewables and heat pumps in buildings/households

- **Buildings**
  - **New decentralized RES/heat pumps in existing buildings**
  - **New decentralized RES/heat pumps in new buildings**

Possible role of auctions:

- Investment support for new appliances
- Multi-unit auctions for homeowners, real estate companies (e.g. in a municipality or nation-wide)
- Single-unit auctions (new heating appliances for all houses in a certain district) for serial renovation companies
- Challenges: small actors and non-comparability of houses

Expansion of individual renewables and heat pumps in industry

- No experience so far
- Possibility for effective and efficient design uncertain
- High variety of technologies, building states and technologies
- For buildings small actors are involved

→ further research necessary for assessing whether there is a potential for auctions

Jenny Winkler
Fraunhofer ISI
jenny.winkler@isi.fraunhofer.de

AURES II

Website:	http://aures2project.eu/
LinkedIn:	AURES II
Twitter:	@auctions4res
Newsletter:	http://eepurl.com/gd42zz

AURES II has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 817619