A cross-national comparative study of the political and regulatory impact on the adoption of demand response in Denmark and Austria

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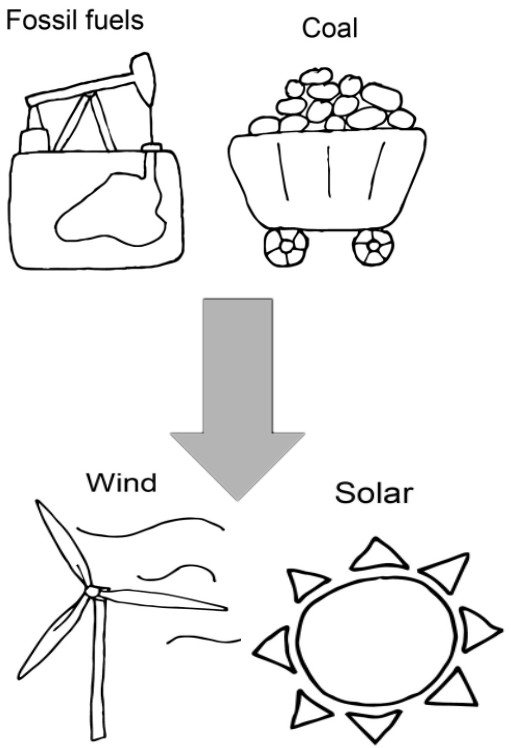
Agenda

- Address the challenges
- Background
- Methodology
- Results and conclusion

Challenges raised by the green transition?

- Green transition
  - Fossil fuel → renewable energy
  - Fluctuating production
  - Security of supply
- Control the demand due to the supply
  - Demand response



Status of demand response in the EU member stats

- 3 different statuses

First group	• No defined party to offer Demand Response • Bulgaria, Croatia, Hungary, and the Baltic countries
Second group	• Demand response through retailers only • **Denmark**, Sweden, Norway, the Netherlands, and **Austria**
Third group	• Demand response through independent aggregation • Belgium, France, Ireland, and the UK

- The effect of policy and regulation

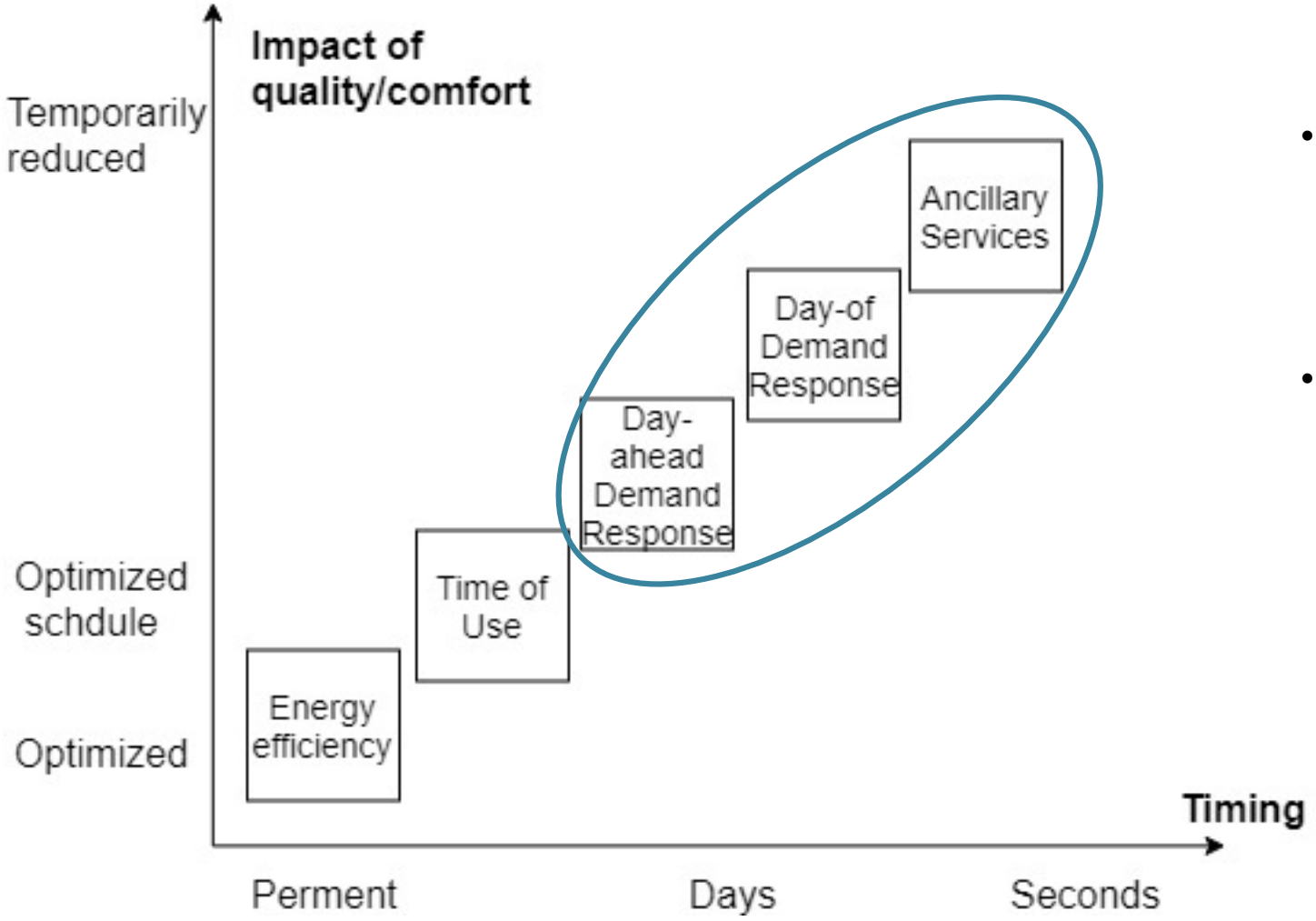
Research question:

Which factors related to policy and regulation influence the adoption of demand response?

Background

- Energy efficiency and demand response
- Demand response
- Aggregators

Energy efficiency and demand response

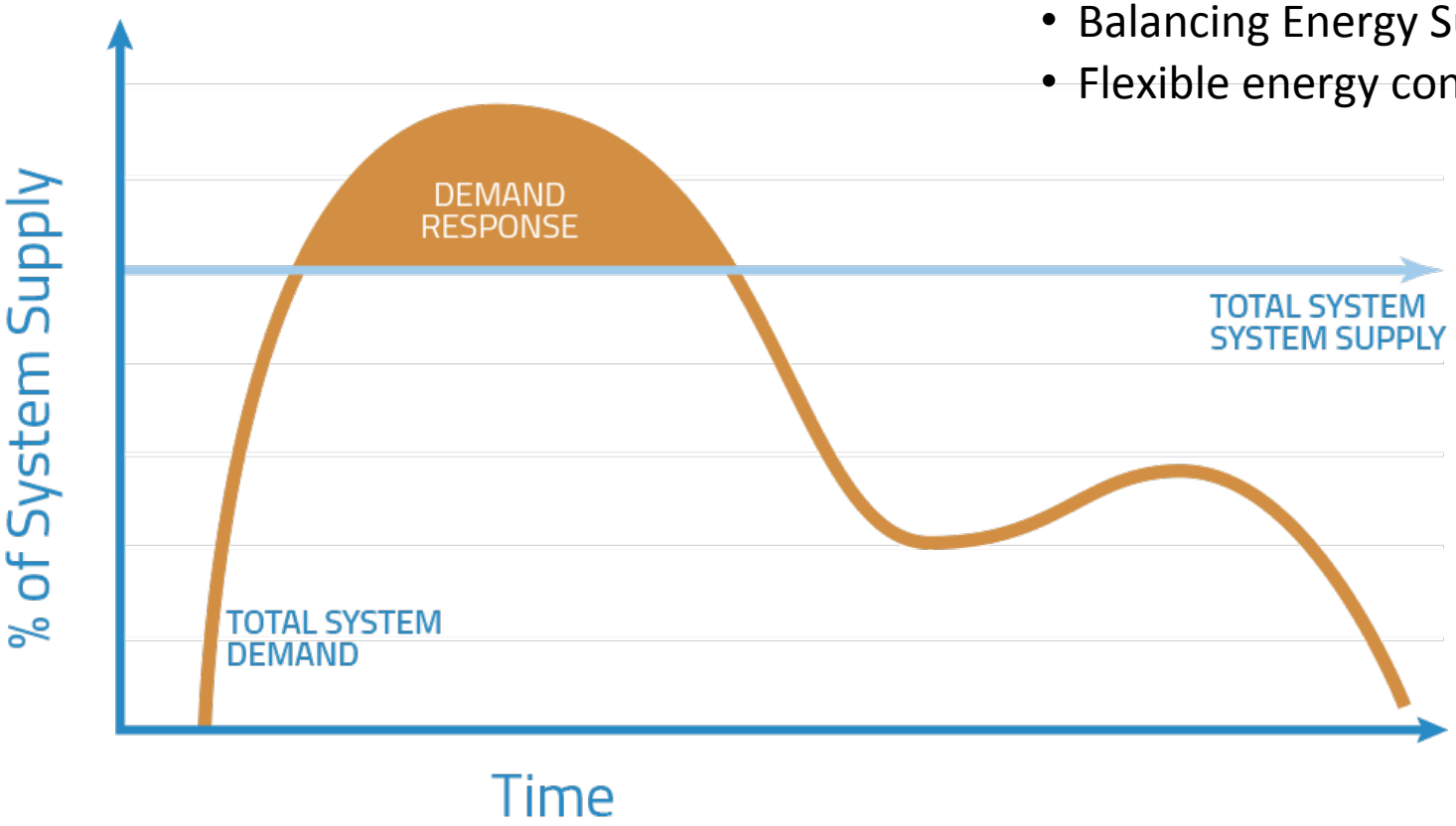


- Traditional energy management
  - Energy efficiency
  - Time of use
- Emerging energy management
  - Demand response
    - Day-ahead
    - Day-of
  - Ancillary services

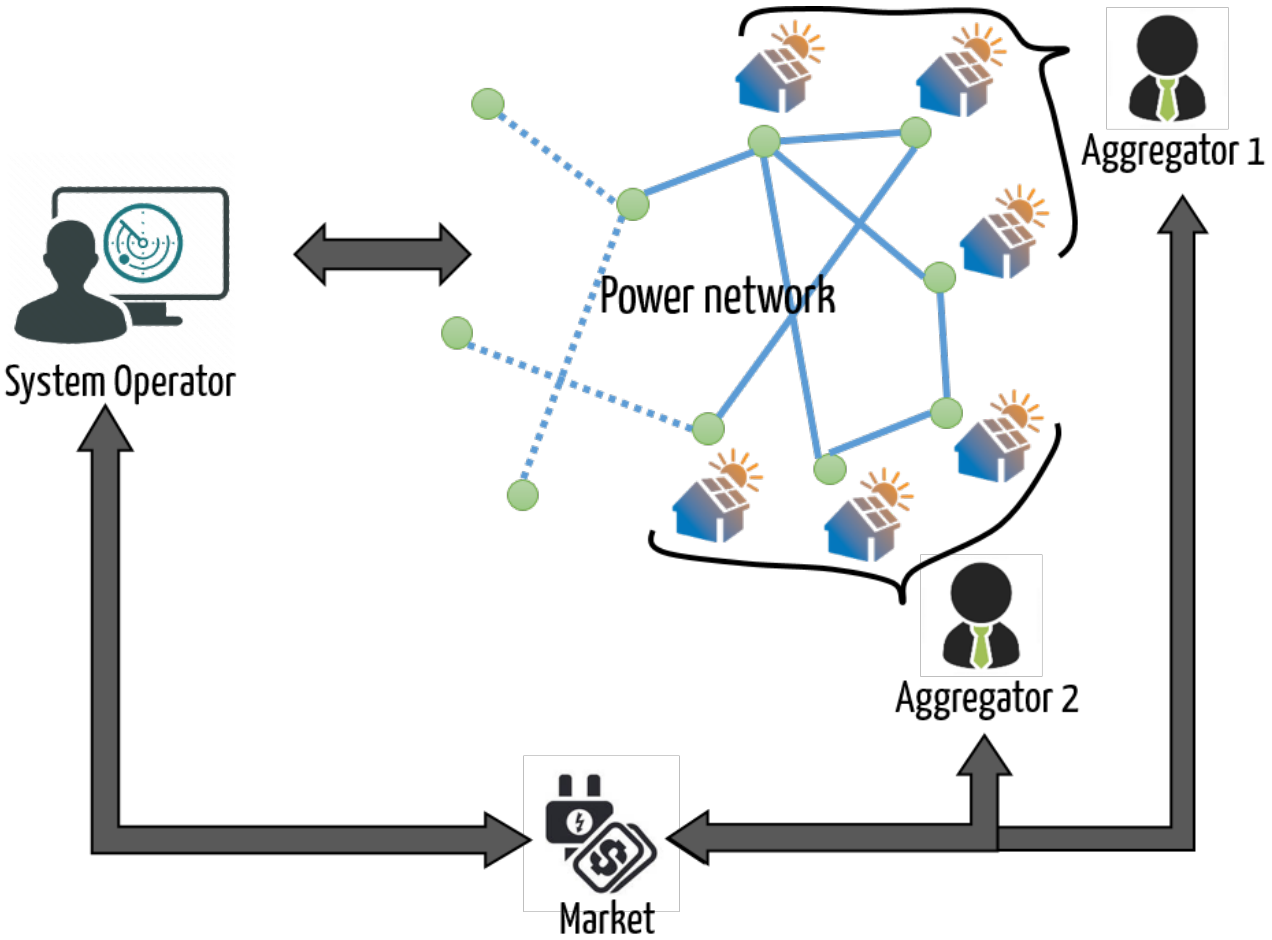
Demand side management

Demand response

- Balancing Energy Supply and Demand
- Flexible energy consumption



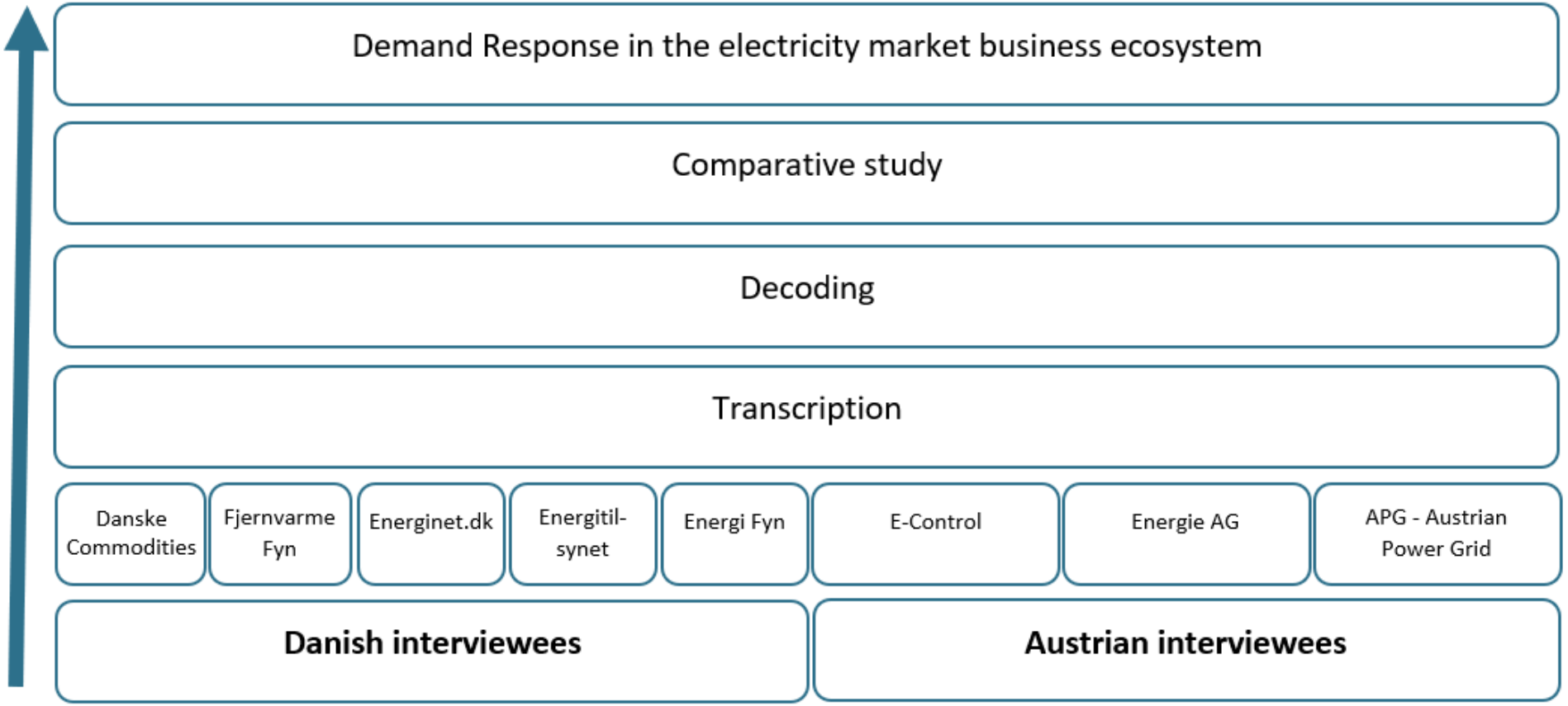
Aggregators



- A pool of electricity loads
- Challenges

Research Process

- Qualitative case study
  - Denmark and Austria
- Eight interviews

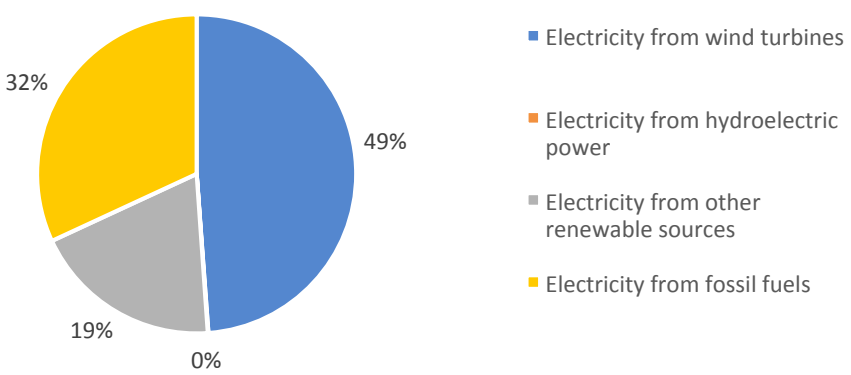


Results

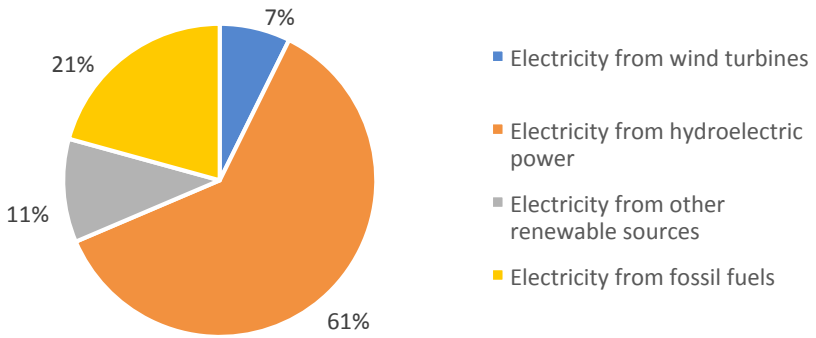
- Renewable energy in the system
- Electricity price
- Market conditions

Renewable energy in the system

Electricity production by source in Denmark 2015



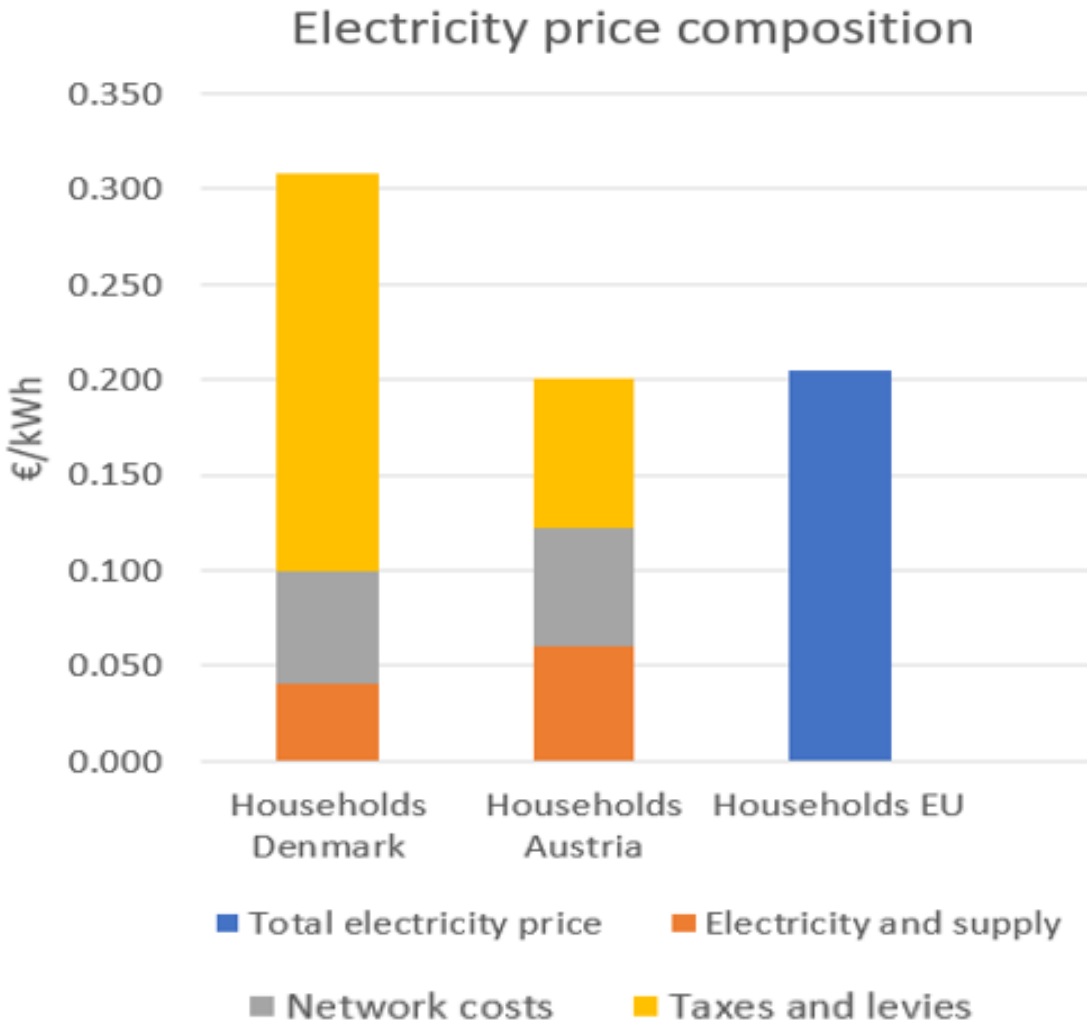
Electricity production by source in Austria 2015



- Not the same need for demand response in Austria and Denmark

Electricity Price

- Influencing factors
  - Renewable energy
  - Network cost
  - Smart meters



Market Conditions

- Balancing market
  - Consumer units are needed
- A aggregator service

	Balancing products in Austria			**Balancing products in Denmark**		
	Primary control	Secondary control	Tertiary Control	Primary control	Secondary control	Tertiary Control
Activation time	<30 s	<5 min.	<15 min.	<30 s	<15 min.	<15 min.
Bidding volumes	At least 1 MW	At least 5 MW	1 MW to 50 MW	At least 0.3 MW	1 MW to 50 MW	5 MW to 50 MW

Conclusion

- Renewable energy in the system
  - Climate goals
  - Support schemes
- Electricity price
  - Taxes
  - Smart meters
- Market conditions
  - Easy market access for aggregators