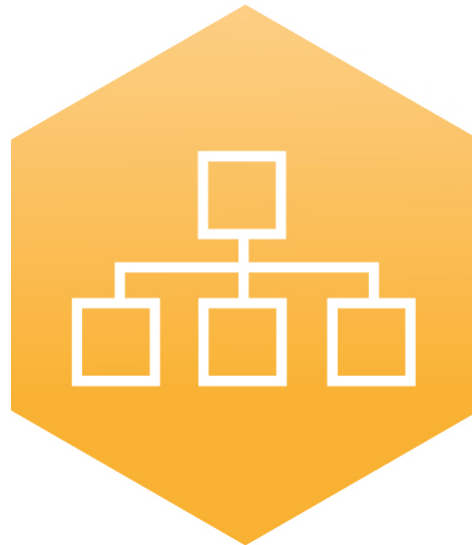
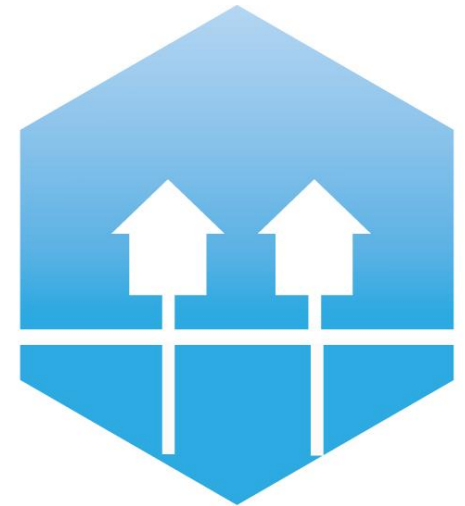




Ownership of District Heating

By Niels Westera



AALBORG UNIVERSITY
DENMARK

4th International Conference on Smart Energy
Systems and 4th Generation District Heating 2018
#SES4DH2018

4DH
4th Generation District Heating
Technologies and Systems

The market ordering regulations for ownership of district heating currently distinct significantly from natural gas and electricity



What ownership structures for new district heating systems would residents of a city in the Netherlands prefer?



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Design space

How can ownership of district heating be structured?



Design concepts for asset ownership (Red=large scale network only)

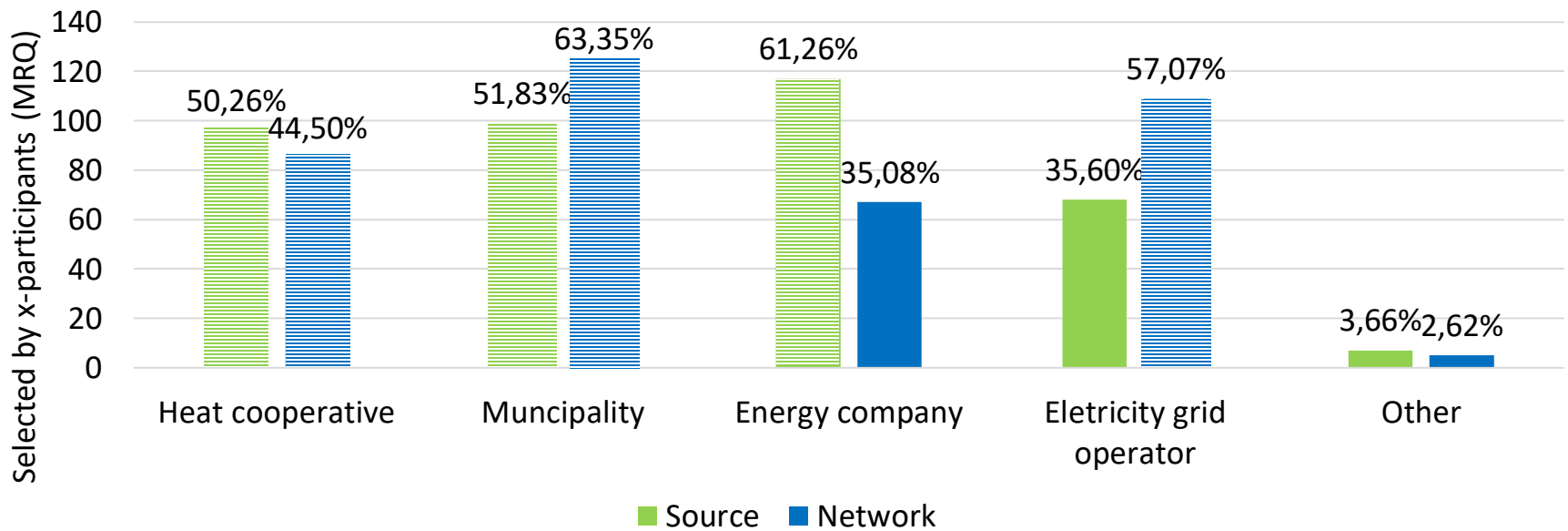
<i>FUNCTIONS</i>		<i>OPTIONS</i>		
1	Generation	Public	Private	Cooperative
2	Transportation	Public	Private	Cooperative
3	Exchanger	Public	Private	Cooperative
4	Distribution	Public	Private	Cooperative
5	Delivery	Public	Private	Cooperative



Public preferences survey



What do you think is a good organisation to own a part of the value chain? (N=194)



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- Integrated Municipally (70-85%)
- Integrated Cooperative (70-80%)
- Competition (65-70%)

Energy justice

How can these three streams be clarified?



Procedural justice

“The perceived fairness of...”

- Participation
- Information
- Trust

(Gross, 2007; Jenkins et al, 2016)

Distributive justice

“The equal distribution of...”

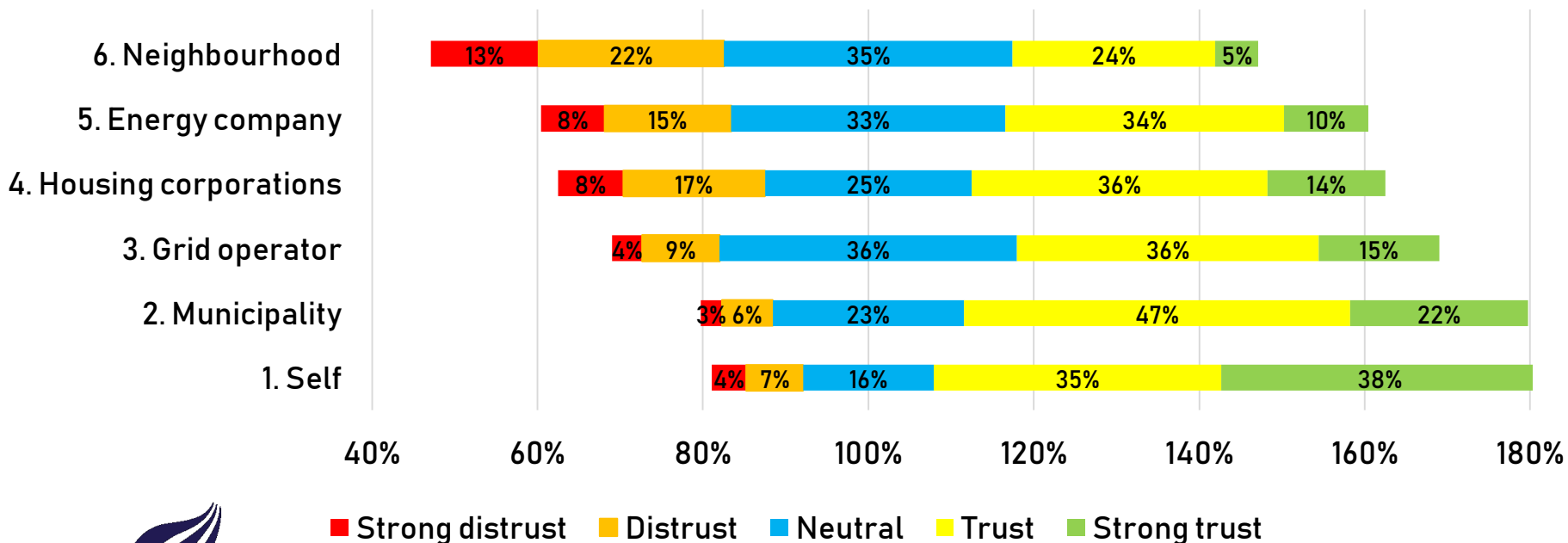
- Costs & Benefits
- Responsibility
- Access

(Adapted from Jenkins et al (2016))



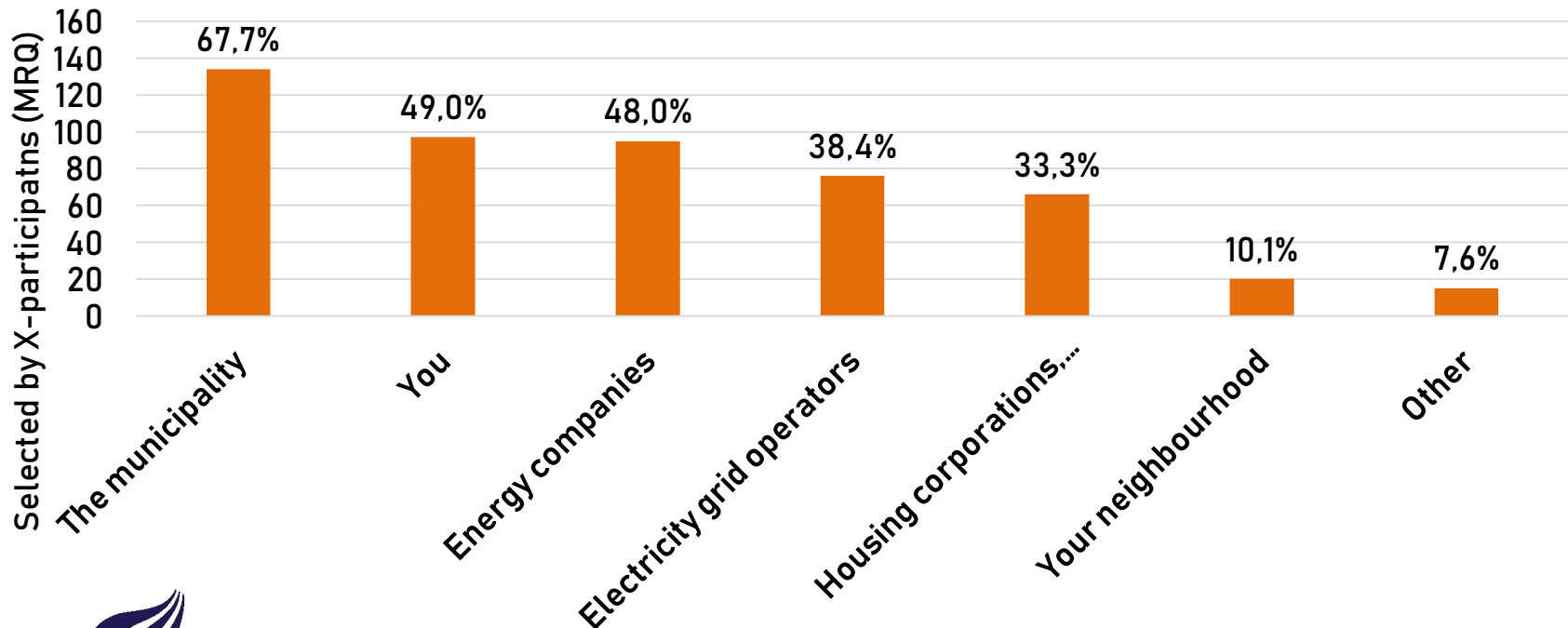
Procedural justice

To what extent do you *trust* the following parties to adapt your house in order to be able to live without natural gas?



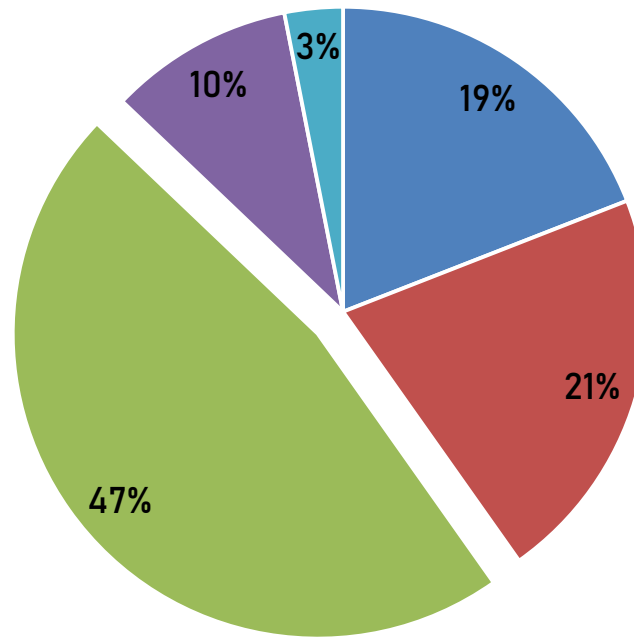
Distributive justice

Which party do you think is responsible for arranging the alternative to natural gas for you? (N=198; 254%)



Procedural justice

How much *influence* do you want to have on decision-making when you have to pay for the adjustments to your home? (N=194)



■ Informing ■ Consulting ■ Consenting ■ Ownership ■ Different

Conclusion

- The proposed design space can be used as a tool for communities to make ownership considerations when establishing a district heating network
- Concept of energy justice can be used to clarify the citizen perspective regarding acceptance on ownership of district heating assets
- *Indication* of three preferred ownership ‘streams’ in Dutch context
 - Integrated municipal
 - Integrated cooperative
 - Competition



Recommendations

- Establish (partial) public ownership in the ownership structure of district heating
- Innovate to overcome technical and financial difficulties of competition
- Guide communities considering district heating with the right tools and knowledge

