

Ownership structure, financing, and regulation: Experience and innovative approaches

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Outline

- Why & When District Heating? A macro-perspective
- Where District Heating? Basic national planning principle
- **How District Heating? Ownership, prices and finance**

Why District Heating? A Macroeconomic Perspective



Is it costly for society to build up district heating infrastructures?

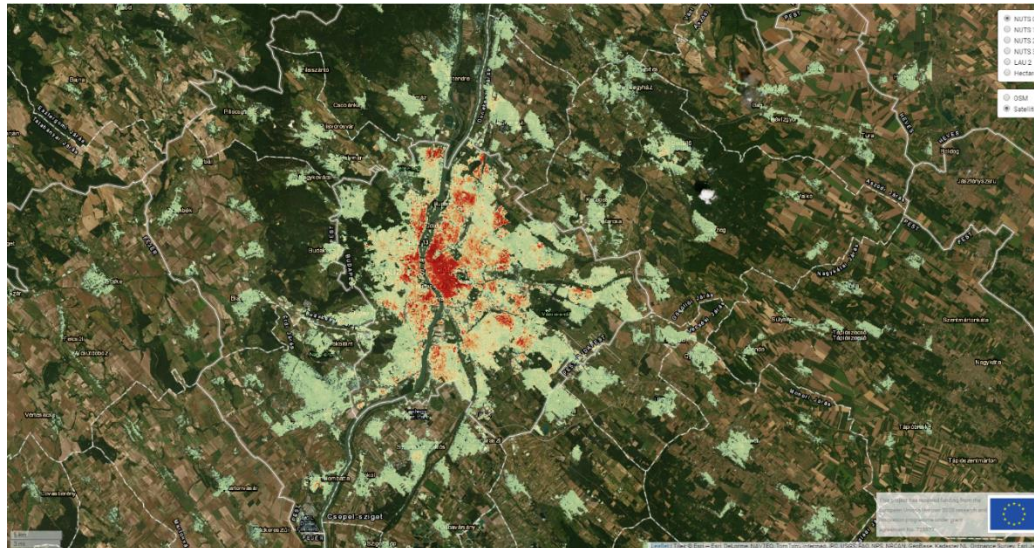
From a macroeconomic perspective, we currently have

- Abundant capital, low interest rates
- No shortages of labour
- Imports of fuels
- A CO₂ crisis

Now's the moment to develop and expand the district heating sector!

Where District Heating?

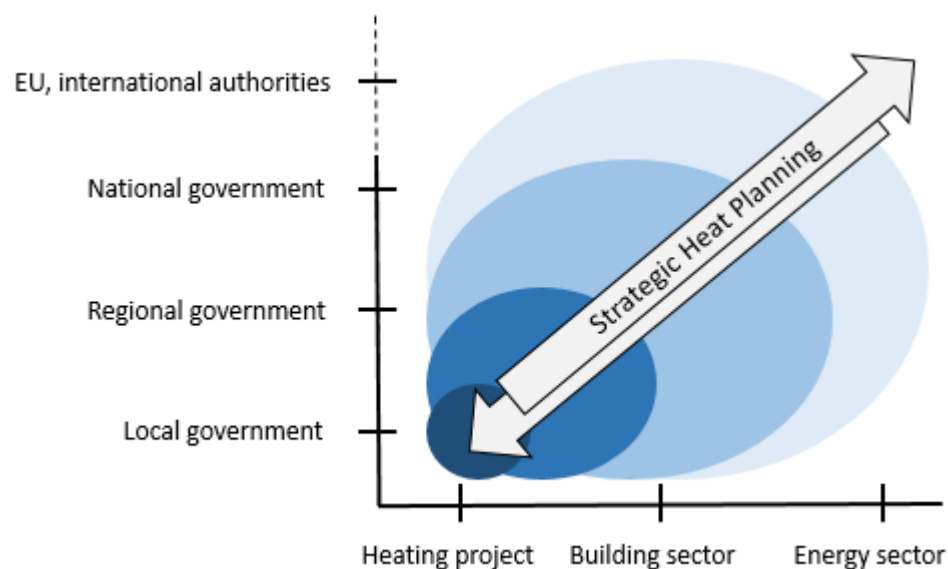
- National procedure for identifying **socioeconomic viable district heating areas**.
- For example, using the European framework for comprehensive assessment of heating and cooling
 - Supported by available tools and reports (Eg. Heat Roadmap Europe / Peta4, Hotmaps, Thermos, and others).
- On this basis, establish designated areas for district heating systems through zoning policies.



How district heating?

What are the regulatory challenges?

This presentation focuses on **Ownership & Price Regulation for a monopoly supply**



The regulative challenge – Company perspective

From a **company perspective**, the regulation of district heating systems must address:

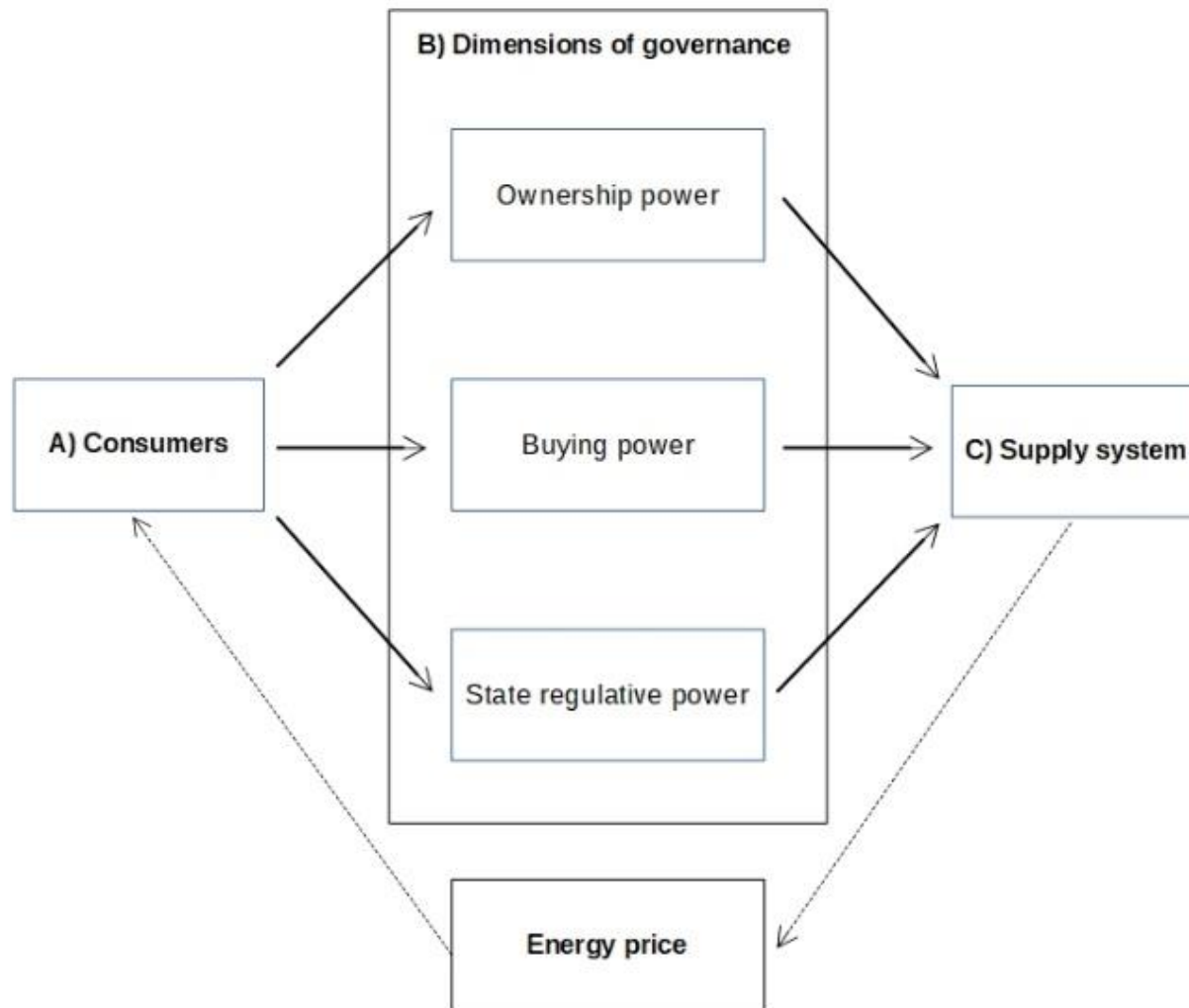
- High upfront capital costs needs long term investment perspective
- Associated risks
- Access to capital

The regulative challenge – Society's perspective

From a **societal perspective**, the regulation of district heating systems must be able to deliver:

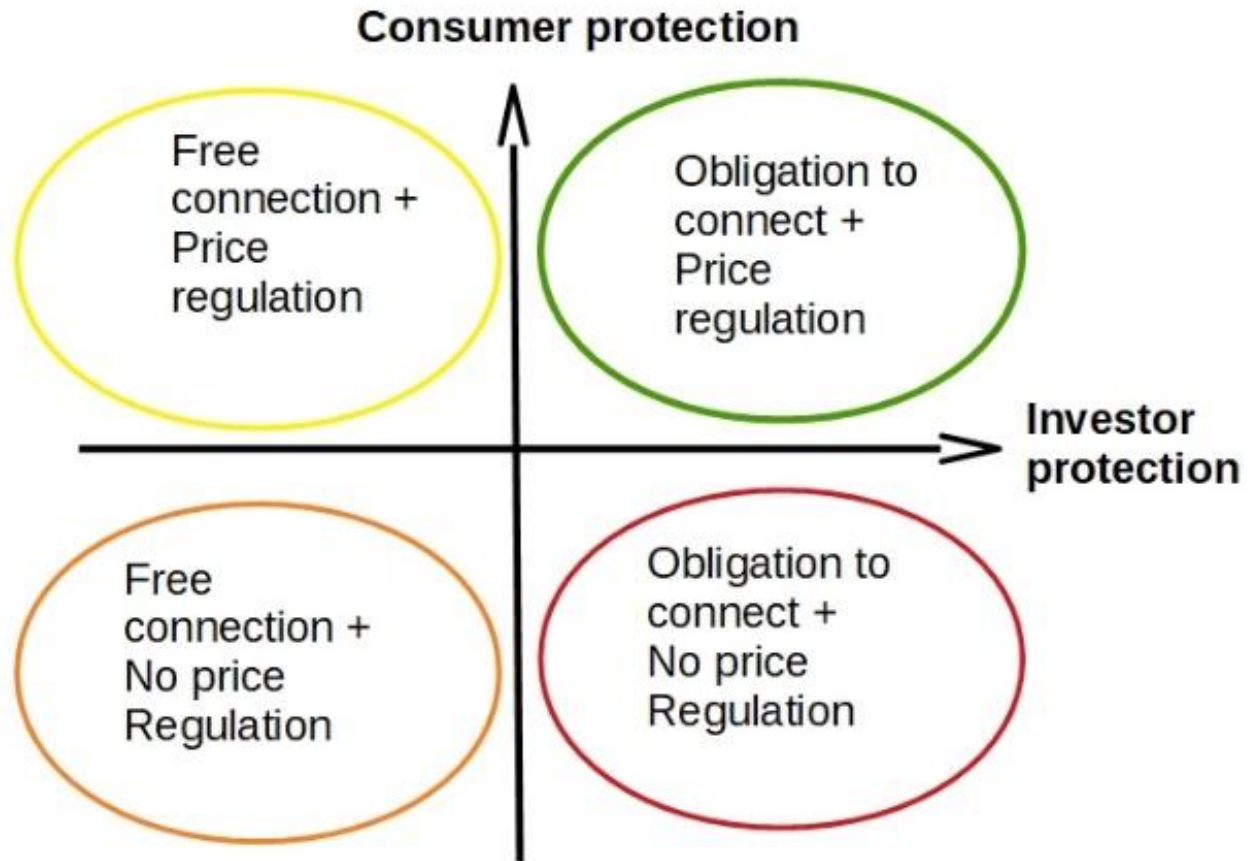
- Consumer acceptance and protection
- The ability to maintain long term strategic energy planning

Three basic forms of regulative strategies



Hvelplund, F., Djørup, S., 2019. Consumer ownership , natural monopolies and transition to 100 % renewable energy systems. Energy 181, 440–449. <https://doi.org/10.1016/j.energy.2019.05.058>

Consumer vs Investor protection



The price-ownership matrix – framework for considering regulative strategies

Consumer ownership

Municipal

Private

Consumer

OWNERSHIP REGULATION

PRICE REGULATION

	Consumer ownership	Public ownership	Private commercial ownership
True costs			
Price cap			
No price regulation			

Price regulation – Price cap principle

PRICE CAP

Using state regulative power to determine a regulative price that seeks a compromise between investors demands for return and the society's need for price control of the monopoly

BENEFITS

Potentially attracts new investors as a return is all allowed

CHALLENGES

It is difficult for regulator to monitor company costs – and thereby difficult to determine/regulate a 'fair price'

Price regulation – True cost principle

TRUE COST PRICING

Ensures that profits cannot be transferred out of the company – profit is either re-invested in the system or payed back to consumers

BENEFITS

Keeps prices low – thus promotes consumer acceptance.
Ensures capital for maintaining and improving grid.

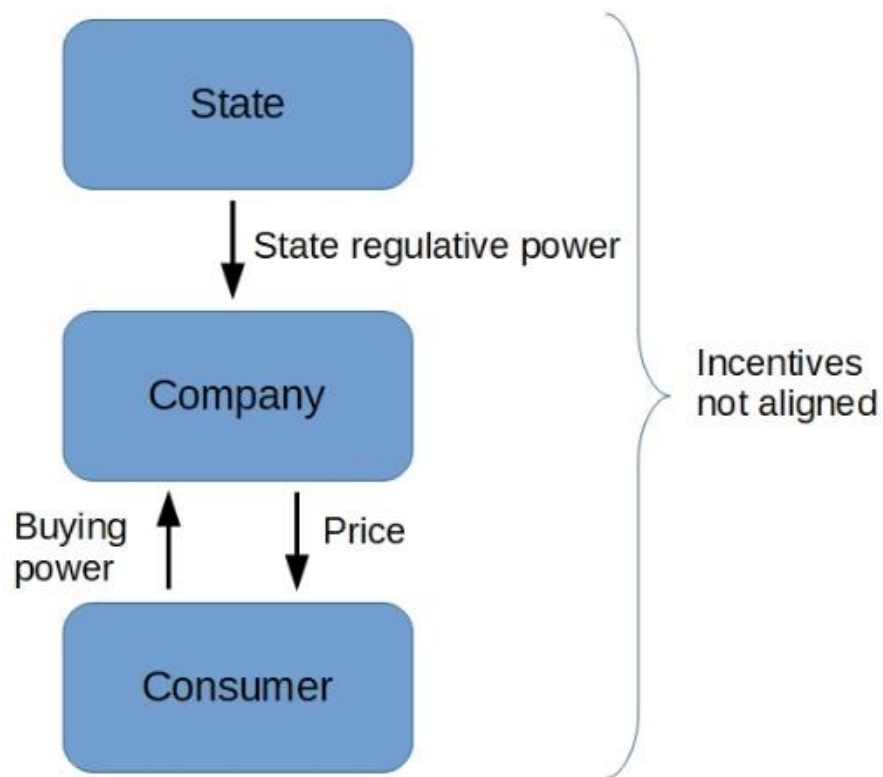
CHALLENGES

Can be difficult to regulate if the interests of the regulated are not sufficiently aligned with intention of the regulator.
Difficult and costly for regulator to monitor true costs

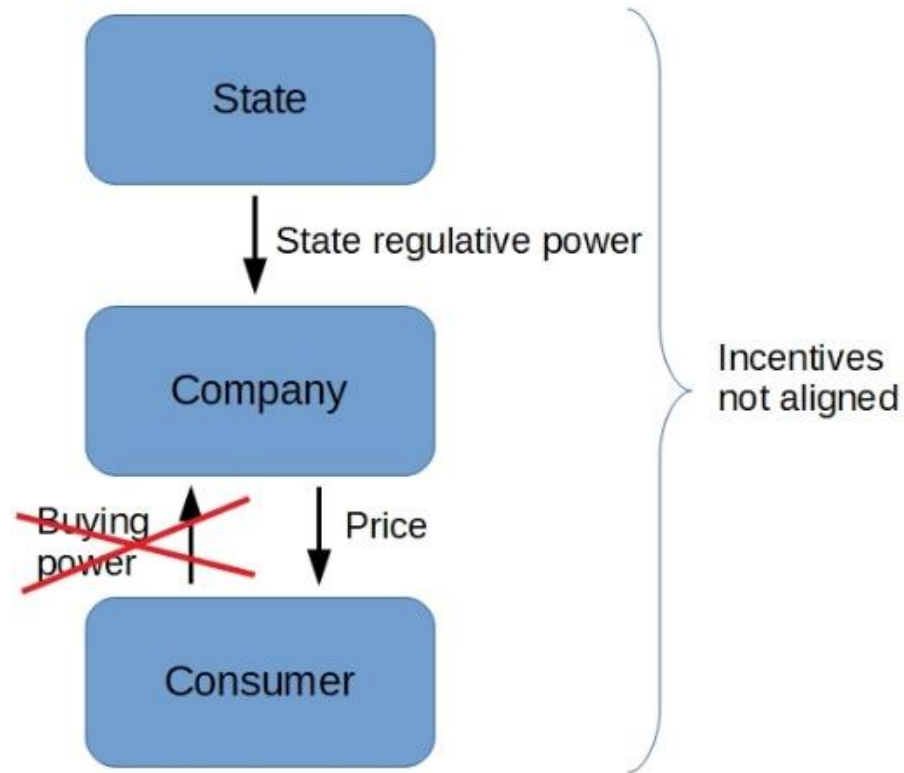
OWNERSHIP

Due to these challenges the ownership structure is an important part of the regulation

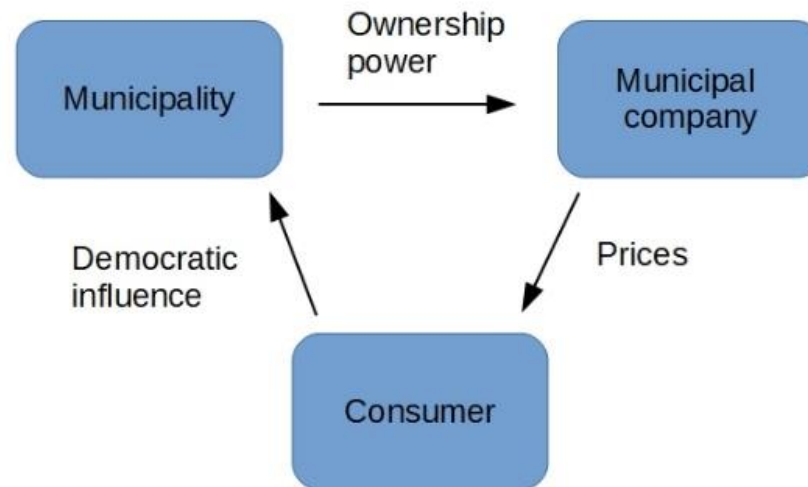
Traditional regulation in a market economy



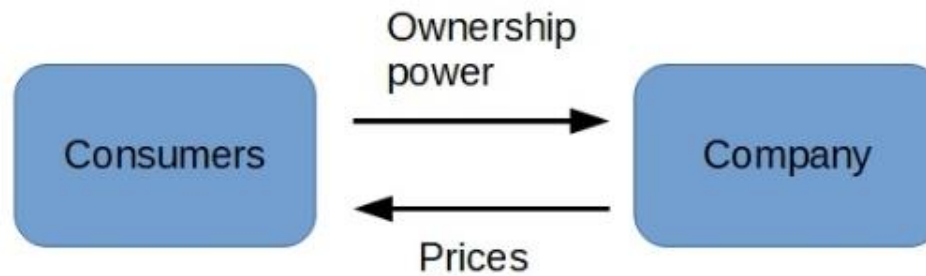
Traditional regulation in a market economy – The monopoly challenge



Example of ownership construction: Local public ownership



Example of ownership construction: Consumer ownership

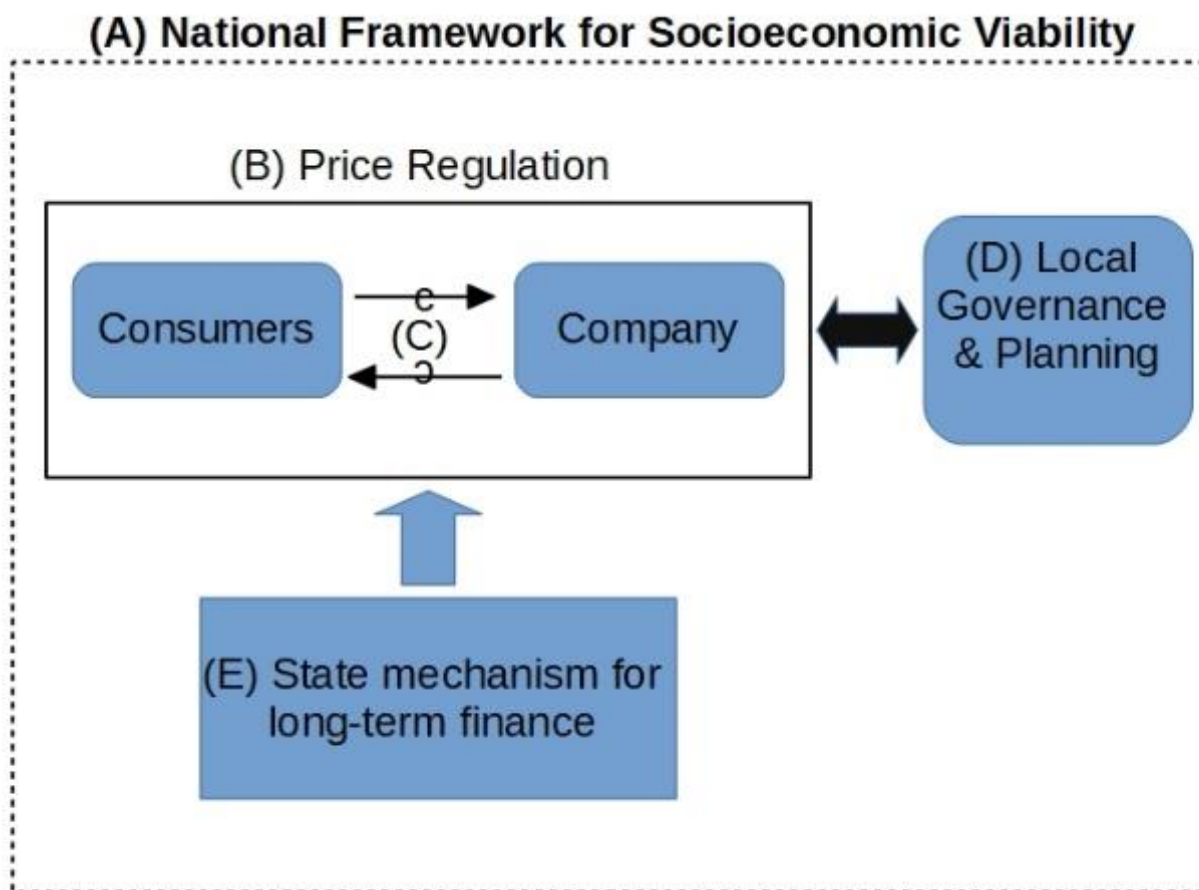


The ownership factor – Experience from Denmark

Name of DH company	DH price	DH price	Change in DH price	Change in ownership
	15 Dec. 2013	18 Dec. 2012		
Hjortekær	37.090	37.096	-6	No. Privately owned
Annebergparken	31.793	31.803	-10	No. Privately owned
Ørslev-Terslev Kraftvarmeforsyning	31.041	31.005	36	No. Privately owned
Slagslunde Kraftvarmeværk	25.614	30.205	-4.591	Yes. Consumer group buys DH supply
Præstø Fjernvarme	23.573	21.329	2.244	No. Privately owned
Lendemarke Varmeforsyning	18.971	13.151	5.820	No. Privately owned
Skævinge Fjernvarmeforsyning	17.178	27.901	-10.724	Yes. Municipality buys DH supply.
Frederikssund Kraftvarme	17.653	17.653	0	No. Privately owned
Gørløse Fjernvarme	16.338	35.125	-18.788	Yes. Municipality buys DH supply.

Information obtained from Ole Odgaard, DEA

Regulatory framework – Danish Case



Summing up

- Historical necessity and opportunity for district heating
- Expansions should be based on socioeconomic assessments
- Regulatory measures should address;
 - Consumer acceptance and protection
 - Access to capital & risk management
 - Company & ownership structures that enable long term planning

References

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Some references in English:

- [1] Chittum A, Østergaard PA. How Danish communal heat planning empowers municipalities and benefits individual consumers. *Energy Policy* 2014;74:465–74. doi:10.1016/j.enpol.2014.08.001.
- [2] Djørup S, Bertelsen N, Mathiesen BV, Schneider NCA. *Definition & Experiences of Strategic Heat Planning* 2019.
- [3] Djørup S, Bertelsen N, Mathiesen BV, Schneider NCA. *Guidance for the comprehensive assessment of efficient heating and cooling* 2019.
- [4] Hvelplund F, Djørup S. Consumer ownership , natural monopolies and transition to 100 % renewable energy systems. *Energy* 2019;181:440–9. doi:10.1016/j.energy.2019.05.058.
- [5] The forthcoming publication from IRENA/AAU!



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