Price regulation regimes for district heating in the EU - with the focus on Denmark

Energy Community Webinar, April 2021

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Outline

- Where District Heating? Basic national planning principle
- How District Heating? Ownership, prices and finance
Breaking the DH price topic up in two topics

Two tariff related topics:

1) **Tariff levels** - What costs are the DH company allowed to include in the tariffs – regulated through price regulation

2) **Tariff structure** - How is the consumer tariff structure designed to cover those costs

This presentation addresses topic 1 **Tariff levels**

The tariff structures is also an important topic – but a separate topic

- See fx Djørup et al «District Heating Tariffs, Economic Optimisation and Local Strategies during Radical Technological Change” DOI: https://doi.org/10.3390/en13051172
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.
Creating the basis for district heating

A national regulatory frame for the heating sector.

- Plays an important role for creating the basis for a district heating economy.
- As an overall national frame, the role of the heat supply act is to outline the societal purpose of district heating systems.

Example - the Danish Heat Supply Act:

§ 1. The aim of the law is to promote the most socioeconomic, comprising environment friendly, use of energy for the heating of buildings and supply of hot water and within this framework to decrease the energy supply’s dependence on fossil fuels.  

How district heating?

What are the regulatory challenges?
This presentation focuses on Ownership & Price Regulation for a monopoly supply

SOURCE: Figure from forthcoming guidebook by AAU/IRENA
From a *company perspective*, the regulation of district heating systems must address:

- High upfront capital costs necessitate a *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 support long term strategic energy planning
Consumer vs Investor protection

- Consumer protection:
  - Free connection + Price regulation
  - Free connection + No price Regulation

- Investor protection:
  - Obligation to connect + Price regulation
  - Obligation to connect + No price Regulation
Three basic forms of regulative strategies

The price-ownership matrix – framework for considering regulative strategies

<table>
<thead>
<tr>
<th>PRICE REGULATION</th>
<th>Ownership Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>True costs</td>
<td>Consumer ownership</td>
</tr>
<tr>
<td>Price cap</td>
<td></td>
</tr>
<tr>
<td>No price regulation</td>
<td></td>
</tr>
</tbody>
</table>

Good experiences in DK
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 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 paid 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 strength of consumer ownership

The ownership factor matters – Experience from Denmark

Table 1: DH consumer prices for DH companies owned or previously owned by the transnational energy company E.ON

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Hjortekær</td>
<td>37,090</td>
<td>37,096</td>
<td>−6</td>
<td>No. Privately owned</td>
</tr>
<tr>
<td>Annelbergparken</td>
<td>31,793</td>
<td>31,803</td>
<td>−10</td>
<td>No. Privately owned</td>
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<tr>
<td>Ørslev-Terslev Kraftvarmeforsyning</td>
<td>31,041</td>
<td>31,005</td>
<td>36</td>
<td>No. Privately owned</td>
</tr>
<tr>
<td>Slaglunde Kraftvarmefælker</td>
<td>25,614</td>
<td>30,205</td>
<td>−4,591</td>
<td>Yes. Consumer group buys DH supply</td>
</tr>
<tr>
<td>Præstø Fjernvarme</td>
<td>23,573</td>
<td>21,329</td>
<td>2,244</td>
<td>No. Privately owned</td>
</tr>
<tr>
<td>Lendemarke Varmeforsyning</td>
<td>18,971</td>
<td>13,151</td>
<td>5,820</td>
<td>No. Privately owned</td>
</tr>
<tr>
<td>Skævinge Fjernvarmeforsyning</td>
<td>17,178</td>
<td>27,901</td>
<td>−10,724</td>
<td>Yes. Municipality buys DH supply.</td>
</tr>
<tr>
<td>Frederikssund Kraftvarme</td>
<td>17,653</td>
<td>17,653</td>
<td>0</td>
<td>No. Privately owned</td>
</tr>
<tr>
<td>Gørlev Fjernvarme</td>
<td>16,338</td>
<td>35,125</td>
<td>−18,788</td>
<td>Yes. Municipality buys DH supply.</td>
</tr>
</tbody>
</table>

*Consumer prices are listed for a typical house (130 m², 18.1 MWh heat consumption). 1 Euro ~ 7.5 Danish Kroner.*

Open access publication: Ole Odgaard & Søren Djarup (2020) “Review of price regulation regimes for district heating”, International Journal of Sustainable Energy Planning and Management. DOI: [https://doi.org/10.5278/ijsepm.3824](https://doi.org/10.5278/ijsepm.3824)
Enabling framework for district heating
Summing up

- District heating projects should be based on socioeconomic assessments
- Regulatory measures should address;
  - Consumer acceptance and protection (low returns on investments)
  - Access to capital & risk management
  - Company & ownership structures that enable long term planning