



EBO Consult A/S



## Summary

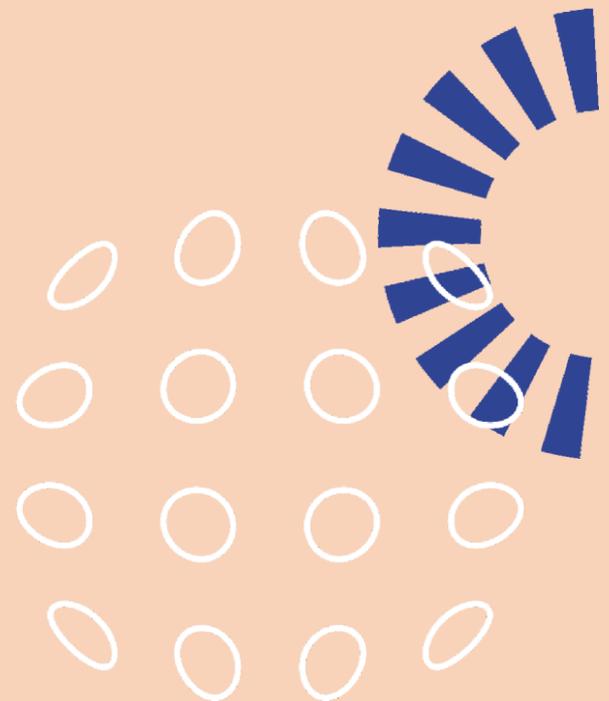
Cooperative district heating in the making.

*Inspiration from Denmark and first achievements in the Netherlands*

20 september

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# The emergence of cooperative district heating

## The emergence of cooperative district heating

The reason why district heating cooperatives have managed to develop in Denmark is due to a historic and cultural condition. It has always been a part of Danish history and culture to solve local issues together. Back in the days, when the money was fewer, it was a normal procedure to locally share the investments in assets, and afterwards share the benefits of the assets. When the oil crisis happened during the 1970s - 1980s, it created heating problems, because of the limited supply of oil, resulting in a high oil price. The crisis developed a national and local need for changing the heating source. Because of the cultural tradition of solving problems locally, it was a natural development that the heating problems partly managed to be solved through district heating cooperatives, supported by national legislation. Today, the 323 district heating cooperatives are primarily located in smaller cities.<sup>1</sup>

In the Netherlands, cooperatives are also common in the energy sector. Since the 1980s wind cooperatives were established, but the provision of heat was organised with cheap natural gas from the big Dutch gas bell in province of Groningen. The first district heating cooperative was established in 2008. In the period 2010-2015 some cooperative attempts with district heating failed. Since 2015 the number of district heating initiatives has grown to 80 in 2021. The prospects for cooperative district heating are great because for an important part of neighbourhoods for which a central and large-scale heat solution is (for the time being) not available, but for which a smaller-scale and collective heat solution is possible and has a greater social value than individual solutions. This could be a solution for 45% of the 13.000 neighbourhoods in the Netherlands. An open Coalition Cooperative Heat has published the ambition for at least 1000 district heating cooperatives in 2030.<sup>2</sup>

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<sup>1</sup> Described in chapter: Role of cooperatives in the heating market

<sup>2</sup> Described in chapter: Role of cooperatives in the heating market

Why district heating cooperatives?

## Why district heating cooperatives?

The reason why district heating cooperatives are widespread in Denmark is because they are:

- One of the most effective ways to protect consumers, because they focus on keeping heating price as low as possible.
- Locally rooted with a high engagement and support from the local society, which is crucial when changing energy infrastructure.
- Important players in the green transition because of their focus on long-term planning. The focus is not on short-term profit making.
- Important to sustain a well-functioning regulation. The Danish regulation is effective because it is based on transparency in the heating prices and in the actual costs of the district heating company. The only companies with incentives to share their actual cost with the regulator is the district heating cooperatives.
- Important for citizens, 70 % of the Danes that participated in a survey conducted by Voxmeter for the Danish Association of District Heating think that it is important to keep cooperatives and the non-profit principle in the district heating sector.<sup>3</sup>

In the Netherlands, cooperative district heating is one variant of the three routes to make the built environment more sustainable: the individual route to help individual houses become more sustainable, the contingent route and the collective heat route. The collective heat route has a growing support in the Dutch society, and specifically the cooperative variant of it. Four advantages of cooperative district heating:

- If citizens themselves direct their heat supply, they feel a great responsibility for it, and this leads to greater support and faster realization. This is also apparent from the evaluation of the Natural Gas-Free Neighbourhoods Living labs.
- Citizens that organise themselves for district heating solution are more focused on affordable tariffs in the district than profit-oriented district heating companies.
- Better use of locally available low temperature heat sources.
- And district heating cooperatives are well placed to shave the peaks and drops in the supply of (green) electricity with power to heat, especially if the cooperatives also own the means of production for renewable electricity. Cooperatives that operate 4<sup>th</sup> of 5<sup>th</sup> generation district heating systems can balance the supply and demand of renewable energy in the district and avoid grid congestion. Congestion of electricity in the grid has rapidly become a huge problem in the Dutch energy system.

The urgency to reduce the dependence of natural gas has increased since Russia started a war in Ukraine. In that context a stronger supportive political framework for cooperative district heating is needed. It can be justified based on the track record of cooperatives in the renewable energy sector and based on experiences in Denmark.

- The development of district heating cooperatives is acceptable for many municipalities because the added value of cooperatives for the expansion of wind and solar energy on land is widely acknowledged. The wind cooperatives have proven that they are able to realize renewable energy projects quicker than commercial developers<sup>4</sup>. In the Dutch Climate Agreement, Energie Samen

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<sup>3</sup> Described in chapter: Role of cooperatives in the heating market

<sup>4</sup> Jaclijn Matijssen, 2019 The cooperative wind of change? <https://www.gelderland.nl/Jaclijn-Matijssen>

successfully lobbied for targeting 50% local ownership of renewable energy projects. Many municipalities are taking this target very seriously in the policy frameworks they create for approval of renewable energy projects.

- The Danish experience with the cooperative organizational model has led to 323 district heating cooperatives on a total of 385 district heating companies. None of the cooperatives have gone bankrupt, and their track record regarding consumer tariffs and quality is good.
- The cooperative approach involves citizens in the decision-making process of the heating project, resulting in widespread acceptance on the spatial impact of the heating system. The approach by commercial and public heating projects, in which citizens are informed about the project, result in widespread resistance.



# Differences and similarities

## Differences and similarities

Here we will describe the main differences and similarities between Denmark and The Netherlands with a focus on cooperative district heating.

The main conclusions from the chapter about the political framework are:

- **Role in the development of energy politics:** In Denmark, the political position of cooperatives is established through the Danish Association of District Heating. The Danish Association of District Heating participates in the development of energy politics, which align politics and public interests. In the Netherlands, the political framework for the heating market is in a development phase to create the conditions for a rapid expansion of district heating in the Netherlands. Energie Samen is currently working on establishing their political role in the development of energy politics, by representing the interests of district heating cooperatives. The specific role of energy communities is not fully accepted by the government or put into policy or law concerning district heating.
- **Gas price reference:** In Denmark, gas prices are no longer used as reference in the project proposals when expanding district heating. In the Netherlands gas prices are still used as reference in project proposals. The government is filling the gap between the costs for natural gas and renewable district heating by means of subsidy.

The main conclusions from the chapter about the legal framework are:

- **Legal position:** In Denmark, the position of district heating cooperatives is legally equal to the positions of district heating companies, directed by municipalities and commercially owned companies. The equal level playing field is centered around the non-profit principle and the procedures to ensure that the tariffs are based on acceptable costs of production. If this principle would be adopted as cornerstone for expansion of district heating in the Netherlands, cooperatives would also have an equal level playing field. But since the Dutch government does not seem to be willing to adopt this principle in the Heat Act 2.0, it is necessary to ensure market access of cooperatives by distinguishing district heating cooperatives clearly from profit-oriented district heating companies, by making use of the EU definition of energy communities.

The reason why there is a difference between the two countries is due to the characteristics of the heating markets. The Dutch heating market is competitive because it is regulated to enable district heating companies to make “a reasonable” profit. It follows that the district heating cooperatives are likely to be competing with profit-oriented companies if the area has profit-potential. This might lead to cherry-picking by commercial companies for the “easy” projects and cooperatives having no competition in areas where it is difficult to realize a profitable project. In Denmark, the heating market is regulated by the non-profit regulation, which follows that there is no competition between district heating companies, and, therefore, it is not necessary to legally support district heating cooperatives.

- **License:** In the Netherlands, the ACM (national regulatory authority) provides the heat supply license. It is the ACM that approves the capacity of a district heating company to deliver heat, and the requirements on district heating companies include an extensive administrative organization and internal control system (AO/IC)

approved by an accountant. When establishing a new Danish district heating cooperative, it is necessary to establish the company and develop its statutes, which must be sent to the Danish Utility regulator to be registered. It follows that the new district heating cooperative does not have to prove to the Danish Utility regulator at forehand that it is able of handling all the procedural, financial, and administrative processes to operate and deliver district heating. In other words, developing a district heating cooperative is easier in Denmark than in the Netherlands.

The main conclusions from the chapter about financial issues are:

- **Tariff regulation:** In the Netherlands, the tariff regulations are founded on the NMDA principle which means that the prices should not surpass the costs which a user of natural gas would have for the same amount of heat. Every year, at the end of December, the ACM publishes the maximum prices that district heating companies are allowed to ask from their customers for the supply of heat and cold. Danish district heating is based on local heat supply monopoly. Since it is a monopoly it is founded on a non-profit principle, where costs and revenues balance. The non-profit regulation has proven to be the most efficient in protecting consumers, because the surplus is repaid to consumers in the form of lower consumer prices. It is not possible for district heating companies to make a profit on producing and supplying heat in Denmark, because of the non-profit regulation.
- **Financial structure:** In Denmark, the financial structure for developing district heating is established through municipal guaranteed loan through Kommunekredit. In the Netherlands, there is no financial support structure yet. Sometimes subsidies are available, and in the exploitation phase commercial banks are prepared to provide loans under the condition that the cash flow is sufficiently stable.
- **Heat price transparency:** To incentivize keeping a lower heating price, the Danish Utility Regulator benchmark each year the heating prices for each company in a public report. The district heating companies put an honour in having a low heating price, because it symbolizes that everything is under control. In addition, the companies with the highest heating prices in the benchmarking will be investigated by the Danish Utility Regulator. Based on the price control accountancy in September, prepared by the district heating companies, the Regulator also controls whether each district heating company charges the consumers with the correct heat price, based on the budget. In the Netherlands, commercial district heating companies set one consumer price for all their district heating systems, and the profits or losses of individual district heating systems are hidden. And district heating companies tend to demand prices close to the maximum prices allowed by the ACM.

The main conclusions from the chapter about the organizational structure of the district heating cooperative are:

- **Legal forms:** In Denmark, the cooperative legal structure is the dominant form in which the activities are structured. There are no other legal entities involved in the ownership structure, because the cooperation with different partners in the cooperative structure is settled by a distribution of voting rights in the cooperative itself. In the Netherlands the cooperative is often one of the legal forms involved in

the organisational set-up. In many cases the assets of the cooperative are structured in a limited company owned partly or for the full 100% by the cooperative. This is also due to the lack of a financing mechanism for cooperative district heating, which forces cooperatives into an ownership structure with municipalities, commercial service organisations or DSO affiliates. The different partners distribute the shares in the limited company. It needs to be seen how stable these structures will be.

- **Social housing corporations:** In the Netherlands, the social housing corporations are not allowed to become a member in the board of a district heating cooperative. This is an undesirable legal constraint for the Dutch district heating cooperatives that would like to benefit from the expertise of social housing corporations to develop and operate a district heating company to keep energy prices low for the homeowners as well as for tenants of the social housing corporations. In Denmark, it is nationally regulated that social housing corporations are allowed to participate in the district heating cooperative. The social housing corporations are important to involve, because they often represent a large part of the heat demand and sometimes the renters form the majority of citizens living in a city.
- **Affiliates of DSOs:** In the Netherlands the chapter about market regulation in the Heat Act 2.0 is under discussion because not only cooperatives but also affiliates of DSOs are knocking in the door of the Ministry of Economic Affairs for market access. In many cases district heating cooperatives and affiliates of DSOs are establishing partnerships for the development and operation of district heating projects. In Denmark DSOs do not play a role in the heat market.
- **Shared service organization:** The Danish company, EBO Consult, is a service organization for district heating cooperatives that wish to be fully or partly managed. EBO Consult functions as the link between the board of directors and the consumers. The planning of the strategic direction and the general decisionmaking of the cooperative occurs in the board of directors, but it is EBO Consult that execute the decisions of the board. In the Netherlands, district heating cooperatives are developing a cooperative shared service organisation for the development and the operation of cooperative district heating projects. EBO Consult has been the source of inspiration for this shared service organisation.

The main conclusions from the chapter about the municipal involvement are:

- **Role of municipality:** In Denmark, the role of municipalities are defined when it comes to district heating and its expansion. The municipality can take on different roles that accelerate the expansion of district heating and the green transition. The four roles that the municipality can take are: a company, an authority, an “owner” of the district heating cooperative, and a facilitator of district heating. In the Netherlands, the Dutch government has put responsibility on municipalities to direct the heating transition, but most municipalities do not have the resources, the staff nor the knowledge to carry out this task yet. Many municipalities are looking for their role, some only want to be a facilitator where others want to participate as owner of the district heating company.
- **Relation between the municipality and the district heating cooperative:** According to the Danish Heat Supply Act, the municipality must – in cooperation with the existing district heating company – develop heat plans. Since district

heating cooperatives are widespread, it is often district heating cooperatives that collaborate with the municipalities. In the Netherlands, the district heating cooperatives in many cases first have to compete with commercial district heating companies to be chosen as a partner for the municipalities.

The main conclusion from the chapter about technologies is:

- **Similar technologies:** The technologies used to produce heat are similar. The main differences are the use of biomass, which is more widespread in Denmark compared to the Netherlands, while heat and cold storage is more widespread in the Netherlands. In both countries pilots are taking place regarding 4<sup>th</sup> and 5<sup>th</sup> generation district heating including storage of heat.

The main conclusion from the chapter about the demand for connecting to district heating is:

- **Image:** The main difference between Denmark and the Netherlands is the image of district heating. District heating has existed in Denmark for a long time - it is common and widespread. It follows that there exist a lot of great examples and best practices throughout the country. The main reasons for why homeowners choose district heating in Hvidovre is because it is an easy, stable, secure, green, and cheap heating source. In the Netherlands, homeowners often have no image at all because it is unknown to them. And in the cities with district heating the image is often negative, because it is regarded as too expensive. Sometimes distrust of commercial district heating companies also plays a role because they feel they are connected to a monopoly without transparency about the price. The result is that there is little motivation for connecting to district heating.
- **Motives for district heating:** For Dutch citizens the price for heating is most important. Natural gas has been a cheap commodity in the Netherlands and alternative heat sources were more expensive. District heating is interesting when it is cheaper than natural gas. Other motives are the space needed for the installation, the environmental impact, and the nuisance during installation. Cooperative district heating projects connect to another set of motives of citizens in the energy transition such as are better solutions through more careful processes in the neighbourhood, positive social impacts and increased local democracy.
- **Marketing strategy:** In Denmark, EBO Consult offers a package deal to cooperatives, ensuring minimum nuisance during realisation. The package deal is part of the marketing campaign via formal and informal channels. In the Netherlands, in the first semester of 2022 two district heating cooperatives in Amsterdam and Wageningen have implemented a marketing campaign to get residents to sign for connecting to district heating. Both campaigns were successful as a result of gradual built up of support for district heating by the cooperatives over a period of years. Residents in both districts trust the work and effort that the cooperative has been putting in the district heating project. And the sharp increase of prices for natural gas has given extra motivation to sign for district heating.

The main conclusion from the chapter about tendering is:

- **Tendering process:** In general, the tendering process in the Netherlands and Denmark is similar because both countries are under EU regulation. In Denmark, EBO Consult has a lot of experience with tendering, while district heating cooperatives in the Netherlands are beginning to learn how to do it.

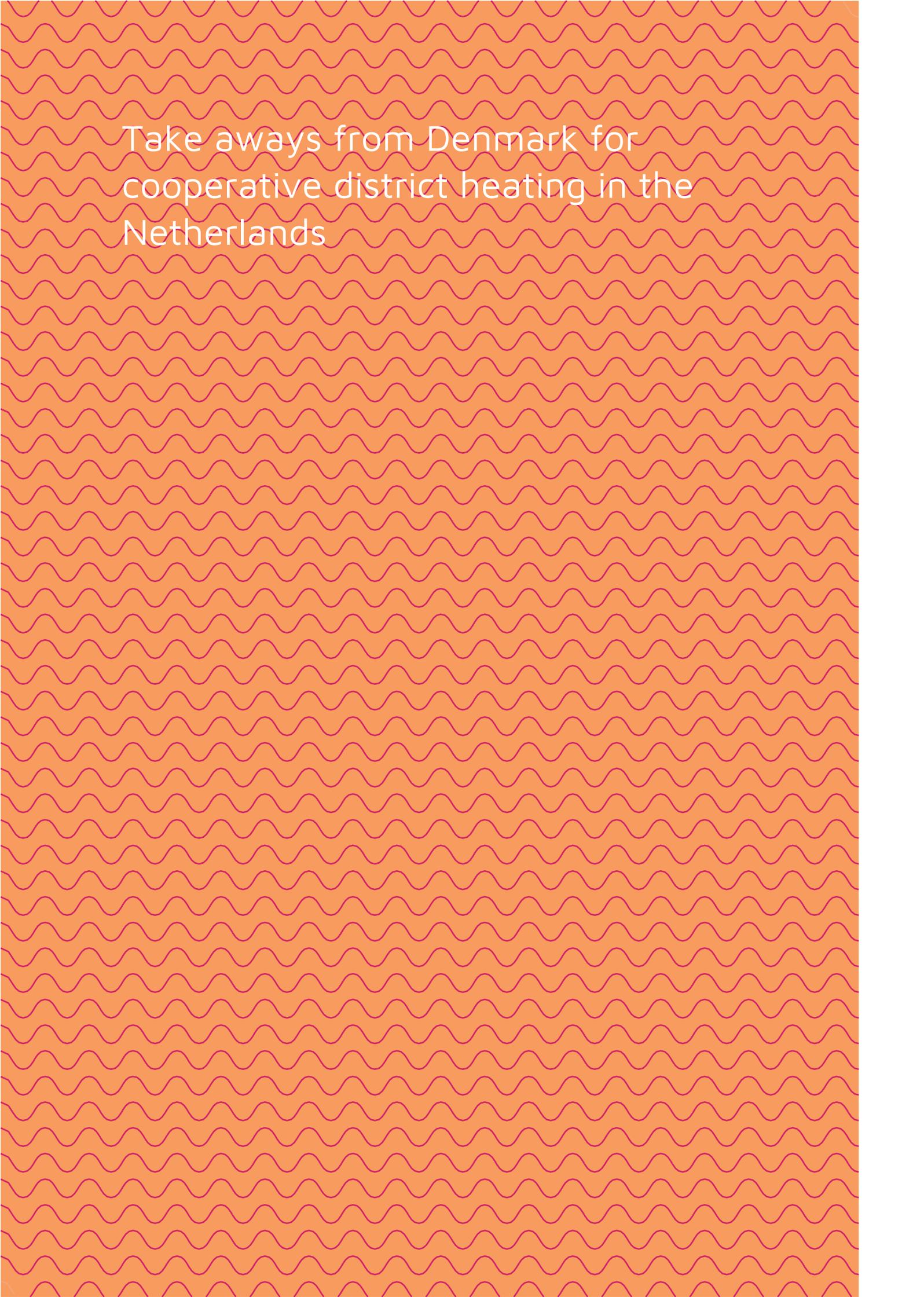
The main conclusion from the chapter about construction is:

- **Competition level:** The main difference between the Netherlands and Denmark is the number of construction companies specialized in district heating. When tendering in Denmark, there are often five to seven companies competing. In the Netherlands, the district heating market is smaller than in Denmark and there is less competition among construction companies. This is one of the reasons why heat prices are 38% to 65% higher in the Netherlands compared to Germany, Denmark and Sweden.

The main conclusions from the chapter about maintenance are:

- **Compensation payments:** According to the Dutch heating law, the consumers must be compensated financially when there is an interruption in the heat supply. It costs 35 Euros for an interruption of 8 hours and for every extra 4 hours there are 20 Euros extra compensation. In Denmark, it is not regulated on a national level, but on a local level. In Hvidovre, it is regulated under the technical regulations of the district heating cooperative, where it says that the consumers must accept that it is sometimes necessary to close the heat supply to maintain the district heating grid.

**Certified district heating plumbers:** In Denmark, the plumbers can be certified in district heating when finalizing an education called Fjernvarmens Serviceordning. The aim of the education is to improve the operation of the district heating units and to ensure that the technical service of the district heating units is executed in the same way and with a high quality. In the Netherlands, Techniek Nederland has a specialized training programme for plumbers, but there is a lack of plumbers specialized in district heating.



# Take aways from Denmark for cooperative district heating in the Netherlands

## Take aways from Denmark for cooperative district heating in the Netherlands

The success of district heating cooperatives in Denmark is the result of a set of conditions that have been created and optimized since the 1970s. The building blocks for the Danish success can be transferred to the Netherlands and accelerate the expansion of cooperative district heating in the Netherlands. Translated to the Dutch context the building blocks that are needed consist of:

- Market access with regulation that encourages district heating cooperatives
- Access to cheap financing sources for development expenditures and capital expenditures
- Governance models of municipalities and district heating cooperatives
- Access to knowledge for cooperatives and municipalities

Market access: Modelling the Dutch heat market on the basis of the non-profit principle is too much asked in the Dutch situation where profit-oriented companies dominate the heat market. To define energy community for heat (warmteschap) in the Heat Act 2.0, is in the Dutch situation an effective way to provide market access to cooperatives and to direct a part of the district heating market towards 'not for profit' and towards treating district heating more as a utility like drinking water. District heating cooperatives are intrinsically motivated to reduce the heat price for their residents. Benchmarking of production costs and tariffs among district heating cooperatives nationally and internationally will create a dynamic towards lower heat prices for the consumers.

Access to cheap financing sources: The KommuneKredit is one of the cornerstones of the Danish success that can be transferred to the Netherlands. Access to cheap financing sources for district heating cooperatives can be justified with the non-profit principle in the same way as it is done in Denmark. In the Netherlands the Bank Nederlandse Gemeenten (BNG) and the Waterschapsbank (WSB) are having similar functions as KommuneKredit and they can provide the financing of capital expenditures for the expansion of district heating. A solution needs to be found for the Dutch municipalities that are in bad financial health and have no capacity to provide municipal guarantees on loans from a district heating cooperative. A work around for the municipal guarantee could be a National Guarantee Fund for cooperative district heating. In Denmark the cooperatives have direct access to the KommuneKredit, and that would be the way forward also for cooperatives in the Netherlands. Because applying the non-profit principle would imply that cooperatives are not building up capital on their balance sheet access and will be dependent on easy access to capital.

For the financing of the development expenditures, Energie Samen prefers to have a cooperative development fund for district heating instead of subsidies. A development fund managed by Energie Samen enables the process of standardizing and exchanging best practises in a fast feedback loop. Energie Samen can provide all initiatives with the necessary information, professional project managers, and legal support and can enforce professionalizing the sector, ultimately refusing loans when a cooperative does not take the necessary steps to develop a sustainable project and governance. Whereas a subsidy instrument places the burden to judge the feasibility of the project on the provider of the subsidy who has less instruments to create the necessary development in governance and project management. This model has been tested for the financing of renewable

energy projects (wind and solar) and is the preferred model for the expansion of cooperative district heating as well.

**Governance models:** With municipalities in the position to direct the heat transition and providing municipal guaranteed loans (if they can) to district heating cooperatives, it is important that the governance models ensure a close cooperation between the municipality and the district heating cooperative. In Denmark these governance models are well-established. These models can be transferred to the Netherlands to ensure longterm trust in district heating.

**Access to knowledge:** The transfer of Danish knowledge and experience with cooperative district heating to the Netherlands can accelerate the expansion of is district heating in the Netherlands. Energie Samen and EBO Consult will continue to cooperate for this end. In the Netherlands Energie Samen is structuring the knowledge in an academy that is open for cooperatives, municipalities and NGOs that are willing to participate in the academy, based on the principle of reciprocity. That implies that knowledge is available open source under the condition that stakeholders are prepared to share their knowledge as well. Knowledge about district heating is being developed in the network of Buurtwarmte under creative commons rules. Transfer of knowledge from Denmark to the Netherlands can take different forms including joint projects and training.





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