



Opportunities and challenges of opening the district heating networks - How to heat the future home?

In Finland there is an ongoing academic and political debate about third party access (TPA) and opening the district heating networks to competition. The subject has also been raised in the new EU Directive on Renewable Energy. The discussion paper of Finnish Energy (ET) describes from the viewpoint of the district heating sector how Finland is organising an efficient heating market now and in the future, and how the heating market is developed on market terms.

The paper also describes what it means in practical terms to open up the district heating networks by increasing regulation.

We encourage our European colleagues and politicians to develop the heating market in the direction presented in the discussion paper. In Finland we have achieved exemplary results through development work.

Focus on the customer

The customer is at the centre of development in the heating market. The targets of the district heating sector must be as follows:

- increasing the customer's freedom of choice and opportunity to have an impact on the heating sources and services
- ensuring competitive prices, security of supply and a high standard of service
- reducing emissions, and increasing renewable energy sources and the utilisation of waste heat
- optimising production and systems for investment in the best technologies
- promoting sensible energy use in buildings and increasing energy efficiency.

Heating: freedom of choice

It must be the target of the district heating sector that customers are free to decide on the method of heating. Regulation must not force them to give preference to a certain form of heating.

It must be simple and affordable to withdraw from district heat and cancel the contract. The selection and changing of the heating method are a major decision for the customer.

Service provider: freedom of choice

The service market is the fastest growing and developing business area in the heating market. In addition to district heating companies, there are several other growing enterprises in the service market.

Energy source or heat product: freedom of choice

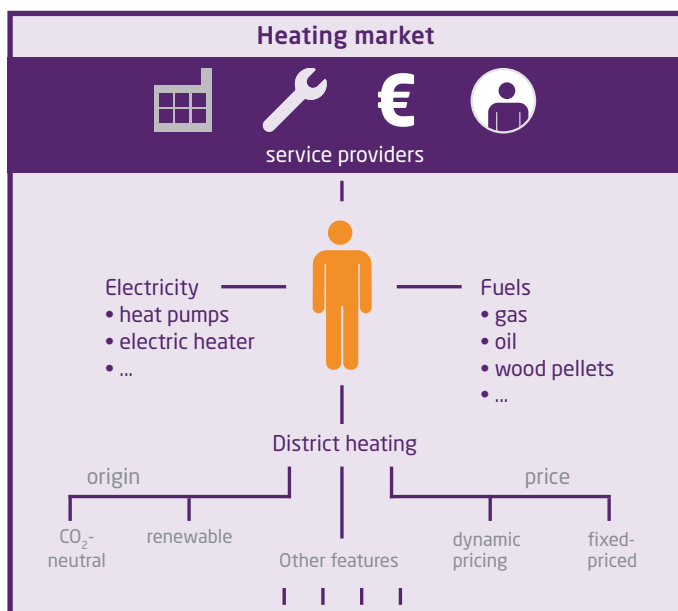
District heating customers must be able to purchase district heat that is produced with renewable energy sources or is carbon-dioxide neutral.

The district heating sector must develop new products for the customers' needs, e.g. products and pricing models that promote demand response. The companies must also help their customers to implement energy-efficiency projects.

The district heating company chooses whether to produce or buy the heat

It is worth for district heating companies to buy heat whenever it is more favourably priced than when it is produced by the company itself or by another producer.

Heat and surplus heat can be purchased from industrial plants, service and retail operators, heat producers and jointly owned energy production companies.



“ The benefits of favourably priced procurement and supply of heat are shared between the customer, the district heating company and society.

Future services

The future housing and heating services are not in all respects tied to heat production, the district heating system or the customer's district heating equipment.

The future services are related to the conditions and the efficient joint action of technical systems. They are based on digitalisation and the utilisation of data. District heating systems are part of this development. It is important that all operators take part in the change.

Finland is the EU leader in district heating operations

Finnish customers can choose their heat product or energy source
More than 75 per cent of Finnish district heating customers can choose a district heat product that is produced with renewables.¹

Measured by heat sales, at least 80 per cent of district heating companies purchase heat from third parties whenever it is financially viable and technically possible.¹ Heat purchased from other parties accounts for one-third of the heat sold by district heating companies to end customers.

District heat in Finland is among the cheapest in the EU countries
Customers in Finland buy district heat that is among the cheapest in the EU countries. The price-quality ratio of district heat proves that the systems and business operations are efficient.

Customer satisfaction is on a stable basis

Finnish district heating companies regularly measure their customer satisfaction. In 2016, the customer satisfaction levels of district heating companies surpassed those of the banks and insurance companies. The price is the most common topic in the customer feedback.²

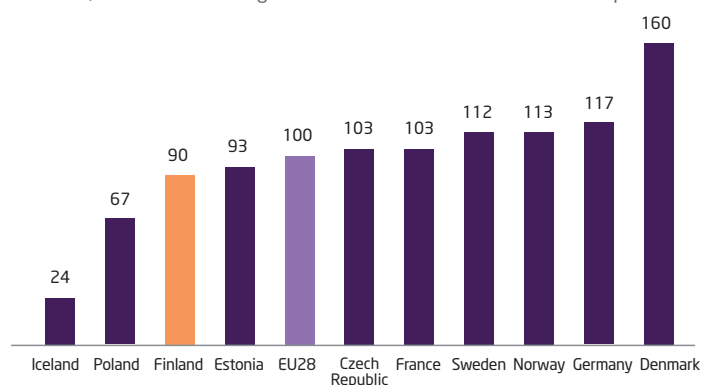
Profitable business operations guarantee secure supplies

Profitable business operations encourage to make investments and to look after the production plants and the heat distribution network.

The majority of Finnish district heating companies are owned by municipalities and the state, and that way the tax and dividend benefits of a good financial result are passed on to society through several different routes.

Finnish district heating companies are profitable. In the current model, the incentives are good and the system is looked after: the security of supply in 2016 was 99.98 per cent.³

Indexed customer price of district heat (without VAT), EU28 = 100 Nordic countries, Estonia and the largest district heat countries in Central Europe



Source: European district heating price series. Report 2016:316. Energiforsk.

The market model is constantly developed by the Finnish district heating sector

It is in the common interest of the customer and the district heating companies that the sector deploys the most cost-effective and environmentally friendly sources of heat.

In Finland, the district heating companies are committed to:

- Discussing with third parties and customers in the region on cooperation in heat procurement.
- Publishing the principles of buying the heat of third parties and customers.
- Openly explaining the reasons if no agreement is reached on the purchase of heat.
- Offering to customers an option to new district heat products and their development.

Finnish Energy is committed to:

- Publishing a recommendation on purchasing and selling heat.
- Providing guidelines on connecting third parties to the network.
- Describing technical models on connecting a user-producer customer to the district heating network.
- Clarifying the rules and legal boundary conditions within the scope of general regulation in terms of competition law.



The district heating sector wants to increase transparency in business operations by developing the current market model.

Policy proposals

- The emissions trading scheme must retain its position as the most important climate policy tool.
- Buildings heated with various heating methods must be enabled. The customers must be free to choose the heating method.
- Energy-related planning must become a permissible system that does not exclude different alternatives.
- Integration of services and industry, which produce surplus heat, in the energy system must be considered in urban planning.
- Possible legal barriers that restrict the development of the service business must be removed.
- R&D funding must be increased in order to develop services related to housing, buildings and urban areas.



The best result is achieved when companies compete with products and services that provide value to customers. It is not necessary to control the development of the heating market with further regulation that freezes operations.

Key issues

With regard to opening the district heating networks to competition through regulation, it is necessary to assess the following:

- What is meant by TPA and opening the networks?
- Will regulation truly increase competition?
- Will the customers really be granted the opportunity to choose between various heat producers?
- Does it create so much competition that it will benefit the customer in the form of increased level of service or lower prices?
- Can other targets be achieved by TPA and opening the networks on the basis of regulation?

Pöyry Management Consulting Oy investigated these issues on behalf of Finnish Energy.

The results of the study are based on market knowledge, the modelling of three different systems, and an analysis of three market models. Two of the models are based on increasing special regulation concerning the district heating business, one on the current market-driven operating environment.

Opening the networks – the current topics of debate

Opening the networks or third-party access (TPA) to the heating networks may be based on two market models and their several sub-models.

In the single-buyer model, the producer sells its heat to a district heating company, which then sells it to the customer. The customer only deals with one operator. The model is divided into sub-categories according to the way the producers' access to the network has been arranged and how network access is regulated. This model is used in all known district heating systems and heating markets. The model has been criticised mainly for the fact that the customer cannot shop around for or choose a heat producer.

In Finland, network access for producers is based on voluntary commercial agreements, general regulation under competition law, and the related supervision.

Two-way district heat is an application of the single-buyer model and a way to intelligibly productise the business operations related to heat purchases. Several companies are already piloting the two-way model.

The network access model is in use, for example, in the electricity market. Therefore, opening the district heating network to competition is often compared to the electricity network and the production and sale of electricity. In the model, the producer seeks a buyer for the heat by itself. For the heat producer, all customers of the district heating network are buyers. The customer has several sellers on offer. There may also be separate sales companies supplying heat from the producers to the customers.

This model is reportedly not in use in district heating systems in any part of the world. Official studies carried out in Sweden and Germany have found it to be poorly suited for district heat (Sweden 2011–2013, Germany 2012).

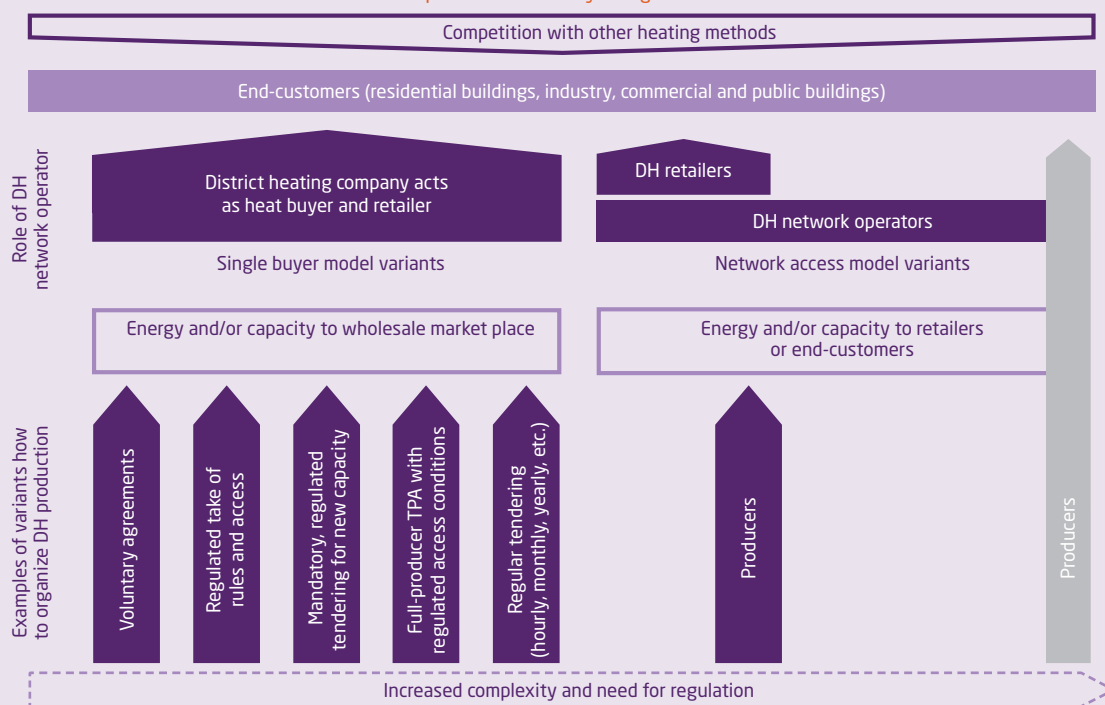
Heat cannot be compared to electricity

Electricity only has one market, for example, in the entire Baltic Sea area. The market has hundreds of producers and retailers and more than 10 million customers. From the viewpoint of opening the district heating networks, every physical system forms its own market. There are more than 300 district heating systems in Finland alone, and the typical number of customers in the systems is between a few dozen and a few thousand. Even the larger markets with 15,000 customers are still small ones.

Electricity moves in one direction at the speed of light, i.e. 1,000 km within fractions of a second. Water, the medium of district heat, moves in two directions 1–15 kilometres per hour. The distance from the production plant to the furthest customer may take the best part of a day.

Opening the networks

Opening the networks can be implemented in a number of different ways, the impacts of which vary to a great extent.



Key results and conclusions of the TPA study conducted in Finland

None of the regulation-based models guarantees more competition or freedom of choice for district heat production or the customer.⁽⁴⁾

The Finnish district heating systems are small in terms of their volume and number of customers. The threshold to enter the sector is high. The district heating business and heat production are very capital intensive, and the current production structure is efficient.

Utilisation of waste heat, deep geothermal energy and industrial-scale bio boilers may be competitive in certain systems. However:

- the most profitable areas of waste heat have already been exploited
- deep geothermal heat is not commercial technology for the time being
- it is probably difficult for even industrial-scale bio boilers to compete with existing producers.

The current operators can utilise these and other new technologies once they become commercial and competitive. This does not require a change in market-related regulation.

Third-party heat producers should be given clear assurance of sufficient return on investment. Without that assurance, the risk of investment grows and it is less attractive to start as a producer.

In the model that imitates the electricity market, some of the customers would have more opportunities to choose between producers. When the number of producers and the production volume probably remain low, only a small number of customers would have this opportunity. Production investment requires a sufficiently low risk which, on the other hand, requires long contracts. This would result in limited freedom of choice.

The strong position of companies already operating in the sector would also continue after the deregulation of networks. The system would become more complicated for the customers!

Customers appreciate low prices

Even if competition on the production of district heat developed, the district heating company's own production would determine the price of heat for a large part of the year - the impact on the price of heat paid by the customers would probably remain low.

There would be no significant price reductions to expect because the target of the new market operators is to ask for the highest possible price for heat. However, if there was heat from a third party on offer, only few would benefit from the competition in the form of cheaper prices.

Complicated model results in further regulation

The current single-buyer model does not require further regulation - general regulation based on the protection of competition and consumers is sufficient for it.

Heavy regulation must not be aimed at:

- market logic
- restriction on the customer's freedom of choice
- preferential treatment or discrimination of new or existing producers
- increasing artificial competition and the incentives for investment.

No extensive evaluations have been carried out on the requirements imposed on regulation. Increased regulation tends to freeze the market and slow down development.

Renewable energy in a cost-effective way without further regulation

Emissions reduction and switching to renewable energy are already progressing rapidly. They are directed and helped along by:

- the emissions trading scheme and taxation
- customers' expectations
- supporting the deployment of new technologies with R&D funding
- locating surplus heat sources close to cities and current district heating systems.

Technologies in the demonstration stage, such as deep geothermal energy, are very interesting from the viewpoint of district heat. Companies introduce new technologies when it is cost-effective. The benefit is passed directly on to the customers.

Emissions will fall, renewable energy will increase and technologies are developed without further regulation.

References

- 1) ET's survey April 2018
- 2) Energiayritysten asiakastytyväisyytystutkimus (Customer satisfaction survey of energy companies), Iro Research 2017
- 3) ET's statistics on the security of district heat supply 2017
- 4) Third-party Access to District Heating Networks, Pöyry Management Consulting, 2018

Further information

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