

The state's actions in ensuring the sustainability of heating supply

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Summary of audit results

What did we audit?

In the course of its audit, the National Audit Office assessed whether the state's actions have secured the sustainable development of the heating supply (primarily district heating), which means a supply of heat which is reliable, with scattered risks related to fuel sources, is efficient, is sold at a justified price and meets both environmental requirements and the needs of consumers.

The audit assessed the actions of the Ministry of Economic Affairs and Communications in planning the development of the heating supply and guaranteeing the supply; the actions of the Estonian Competition Authority and local governments in regulating heating prices and supervising the fulfilment of the requirements of the District Heating Act; and the actions of the Ministry of the Environment and the Environmental Investment Centre in their development of support measures for the field of the heating supply and their evaluation of applications for this support.

Why is it important for taxpayers?

60 % of the population of Estonia uses district heating: heat which is generated in boiler plants or power stations and distributed to consumers via heat networks. District heating systems in Estonia, as elsewhere in Eastern Europe, were mostly designed and constructed decades ago without taking into account the possibilities to cogenerate electricity and heat and use fuels with lower calorific values, but to provide heat for large residential areas and industries whose consumption was greater than today. Current consumption of heat is much smaller in many areas than designed, which is why the water heated in boiler plants cools down in too large pipes before it reaches consumers, leading to a heat loss. Since district heating production equipment and heat networks have not been upgraded in all regions to the extent required, neither the production nor distribution of heat is efficient in many places, thus causing large losses.

According to the District Heating Act, the residents of district heating regions are in most cases obliged to use such heating even though 20 % of its cost often comprises of heat losses. The National Audit Office estimated that consumers paid more than 44 million Euros to cover the heat network losses in 2009.

What did we find and conclude as a result of the audit?

In the opinion of the National Audit Office the Ministry of Economic Affairs and Communications has paid insufficient attention to the sustainable development of the heat supply. The national heat supply development plan has not been drafted the principles for establishing of district heating regions or unified principles for price regulation of heat

have not been elaborated. Very little attention has also been paid to ensure energy security and develop supporting measures for the heat supply and to the actions of the Estonian Competition Authority in regulating the price for district heating.

In the view of the National Audit Office, in order to ensure the sustainable development of the district heating sector the most important thing is to determine in which areas district heating is and will continue to be viable, where heat is offered to consumers at a justified price and produced efficiently. It is feasible for the state only in such areas to finance the development of district heating systems. In areas where district heating is not sustainable, measures must be developed that will enable consumers to make the transition to more efficient methods of heating.

Key observations of the National Audit Office

- The state and many local authorities lack the overview of the situation of the heat supply, and in particular of district heating. For example, they do not know the total length of district heating networks, how big is the heat loss in pipelines or how much must be invested to improve the heat network. The Estonian Competition Authority and local authorities have this information partially, but it is not reflected in national statistics. A heating sector development plan and measures to make district heating systems more efficient and to ensure their sustainable development have not been worked out and implemented. Heat losses from an optimally designed network which is in good working order should not exceed 10 %. However, the average in Estonia is above 20 %, and it is the consumers who pay for this lost heat.
- Many consumers are forced to use district heating although it is not known whether it is more economical and more efficiently produced and distributed than the heat from alternative sources (such as local boiler plants, heating pumps etc.). A survey of local governments showed that in 89 % of district heating region establishing cases they had not investigated the condition of boiler plants and heat networks, nor the need for investments or their sustainability (e.g. whether there was or would be a sufficient number of consumers in the area in the future), they had not considered the use of alternative heating solutions and they had not determined whether district heating was the most economical and efficient method for providing heat in the area. As it happens the district heating regions have been established in several places where district heating is neither the most economical nor the most environmentally friendly means for providing heat. The state has not clarified the status of a sustainable district heating region in the District Heating Act. Living in a district heating region means that the use of such heating is mandatory even if it is neither the most efficient nor the most economical way of heating. As a result, it is the residents who pay for inefficiently produced and distributed heat. In 36 of the 164 network regions audited, district heating was more expensive than electric heating.
- Almost half of the heat production depends upon imported fuels. Natural gas imported from Russia alone accounted for 44 % of all fuels used for heating in 2009 (Statistics Estonia). According to the

energy sector development plan, a situation in which no single fuel accounts for more than 30 % of the balance of fuels used to produce heat needs to be achieved by 2020. Over-reliance on natural gas may endanger the heat supply as in the event of an interruption of supplies boiler plants would not be able to make the transition to replacement fuels or make use of reserves. For example boiler plants cannot form natural gas reserves, so in the event of supply problems they should find an alternative fuel source. The state lacks the overview of the ability of boiler plants to use reserves or replacement fuels. As a consequence, the number of consumers that would be left without heat supply in the event of an emergency is not known.

- The Estonian Competition Board does not treat companies equally in approving the price for heat. It has established principles for the approval of the price, but has not implemented them in a way that would ensure a transparent approval of prices that treats all producers equally. The difference in price approval has affected the ability of producers to cope financially. Despite the fact that the approval of heat prices has been the responsibility of the Estonian Competition Board alone since Nov 1st 2010, the state has yet enacted binding principles on the approval of prices.
- Most of local authorities were not capable of approving the price of district heating. The audit revealed that practices among the local authorities included in the audit sample varied wildly, and in many cases the costs to be counted in the heat price submitted by companies were not analysed in terms of whether they were justified or not. Analysing the approval decisions it was not possible to understand which costs were counted in the heat price and whether these costs were checked. In two local authorities the companies were selling the heat at a price which was not approved.
- Price approval has not fulfilled the aim of ensuring a sustainable supply of heat for consumers in the future. The local authorities included in the audit sample did not in the course of approving the heat price assess, how much the companies should invest in order to be able to produce and distribute heat efficiently. Due to a lack of resources, the Estonian Competition Board has set priorities in its operations and has not paid sufficient attention to assessing the need for investments. Therefore it is not always guaranteed that the production and distribution of district heating are made more efficient. This endangers the sustainability of the heat supply in the long term.
- The state has not analysed how much should be invested in order to improve district heating systems, and no principles have been developed on the basis of which support could be given to the areas where district heating needs to be preserved but where currently it is in a poor condition. Until now the support has been primarily based on aspects of environmental protection amounting to 14,83 million Euros from 2005 to 2009. By the assessment of local authorities, almost 716 million Euros should be invested in the field of district heating. It is the view of the National Audit Office that heating companies themselves are not capable of making such an investment with the current heat price level.

The Environmental Investment Centre's 2009 support measure entitled 'More widespread use of renewable energy sources for the production of energy' led to undesirable developments on the heat market, since the nature of the heat supply sector was not taken into account in the drafting of its terms and conditions. Local authorities for example have been under the pressure from producers to establish district heating regions so that the latter might apply for support. Further more in the assessment of applications very little attention was paid to the sustainability of district heating regions and projects. This might have led to the implementation of projects which are unable to support themselves in future. The terms and conditions of the measure regulations and assessment guidelines were not followed in the assessment of the first round of applications also. Due to imprecise evaluation, funding was granted to six projects which should not have received it during the first round of financing decisions. Two applicants who should have received funding during that round, received it later after the state obtained funds from the sale of greenhouse gas assigned amount units (AAUs) to Austria.

Responses of auditees

In his response, the **Minister of Economic Affairs and Communications** thanked the National Audit Office for drawing his attention to the problems in the heating sector and stated that he agreed on the whole with the recommendations made.

However, the minister felt the analysis carried out by the National Audit Office in a number of areas were inadequate. For example, he stated that the National Audit Office could have more thoroughly analysed how support granted on the basis of the Electricity Market Act has contributed to the development of the power and heat cogeneration from renewable fuels; how many times the lack of fuel has led to interruptions in the supply of heat; why the heat companies who have terminated their operations did so; and whether there was any danger of the companies operating today going bankrupt. The minister also felt that the National Audit Office should have assessed the cost-effectiveness of its recommendations.

The minister did not agree with the National Audit Office's view that the state lacks an overview of the situation of the heat supply and district heating, and said that he considers the data that is available to the public through national statistics is sufficient to get an understanding of the field. However, the minister concurred with the National Audit Office's recommendation to commission further statistics, since the ministry has had to order relevant data required separately from Statistics Estonia.

The **National Audit Office** would like to draw the minister's attention to the fact that the performance of more comprehensive analysis is the task of the Ministry of Economic Affairs and Communications as the ministry responsible for the field in question. Due to its coordination of the field and the drafting of the heating supply development plan, the ministry should have an overview of interruptions to the heat supply and their causes at all times. The ministry should also be aware of the situation of heating companies and the possibility to face bankruptcy, since heat price approving is also performed by the state. In its audit reports the National Audit Office has highlighted the problems associated with the heat supply and described the related risks on the basis of the data that was available

during the audit. It is the role of the National Audit Office to provide an assessment of the functioning of the field, not conduct studies that are important to it on the ministry's behalf.

The Director General of the Estonian Competition Authority agreed with most of the recommendations made in the audit. The authority did not agree with the recommendation made to the Ministry of Economic Affairs and Communications to establish principles for the approval of the heat price with a regulation of the minister. In the authority's view, such principles should be clarified in the District Heating Act in order to avoid political influence on price regulation. Neither did the Director General consider it possible for the authority to consistently check the same cost components for all companies using the same method.

Although the Estonian Competition Authority agreed with most of the recommendations and instigated reviews of internal procedures during the term of the audit so as to make them more specific, the Director General did not agree with any of the observations or assessments made regarding the authority itself. The Director General's opinion is that its actions to date have been right and that the shortcomings identified by the National Audit Office have no basis, since amongst other things the opinions of consumers have not been taken into account.

The **National Audit Office** notes that although the Estonian Competition Authority feels that the National Audit Office's analysis focused too heavily on producers, the audit as a whole was designed to achieve better service for consumers. The audit highlighted the need to reduce heat losses, to improve the quality of service and security of supply, and to guarantee the consumers that heat will remain available via district heating in future.

The Minister of the Environment and a **member of the management board of the Environmental Investment Centre** are of the view that the analysis of the heating supply carried out by the National Audit Office will be of use in ensuring a sustainable and environmentally friendly supply in future. The analysis will be able to be used in the development of support measures for the heating sector.

The **Minister of the Environment** agreed with the recommendations of the National Audit Office and promised to work more closely with the Ministry of Economic Affairs and Communications, the Estonian Competition Authority and the Environmental Investment Centre in future while developing supporting measures for the heating market.

In their response, the **member of the management board of the Environmental Investment Centre** stated that the centre had updated and improved its internal procedures. The working procedure of an assessment committee has been adopted which has made the management of the assessment process and supervision of experts more effective. The response from the centre also addressed the findings set out in the report issued by the National Audit Office.

In his response, the **Minister of the Interior** accepted the recommendation of the National Audit Office to coordinate the development of plans for the effective functioning of the heating supplies of local authorities and added that experts from the Ministry of Economic

Affairs and Communications should be involved therein. The minister feels that the Estonian Competition Authority should present their own assessment on the appropriateness of such plans.

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Sector overview

Heat network, heat pipeline – pipeline for delivering heat carrier from the heat source to the consumer.

Efficient activities are those where the goal is attained with smallest possible costs and losses.

In case of efficient electric power and heat cogeneration, the heat emitted in power generation process is directed to the district heating network, thus achieving greater economy in fuel consumption.

1. The heating and energy sector is a strategic infrastructure designed to ensure continuous supply of the state with high-quality fuels, electricity and heat at optimal prices.¹ The fuel and energy sector must be as efficient as possible and meet the safety and environmental standards, and its sustainable functioning is one of the foundations of national security - ensuring its sustainability is a national priority. Because of the cold climate heating supply is an essential element of the Estonian energy sector.

2. The main method of supplying heat in Estonia is district heating: the heat for the entire city, settlement or group of buildings is generated jointly in a boiler plant and then distributed via a **heat network** or **pipeline** to the consumers. District heating is used in 151 of the 226 local governments (LGs) in Estonia, and it is estimated that 60 % of the country's population consumes heat generated this way. The rest of the population uses local heating equipment to generate heat: e.g. furnaces, boilers, heat pumps, electrical heating or other alternatives.

3. District heating is the preferred heating method in settlements and cities. If the district heating system is well designed and constructed and it functions **efficiently**, it allows electricity and heat cogeneration, to use the heat emitted in industrial production, to employ cheaper and lower quality fuels and it pollutes less air. The investments necessary for installing the heating equipment and the exploitation costs per consumer are also smaller than those for local heating devices.

4. The operation of district heating in Estonia is governed by the District Heating Act aimed at ensuring a secure, reliable and efficient heating supply at a justified price, meeting the environmental standards and the consumers' needs. In addition the sector is governed by the Competition Act as most of the heating companies have a monopoly position.

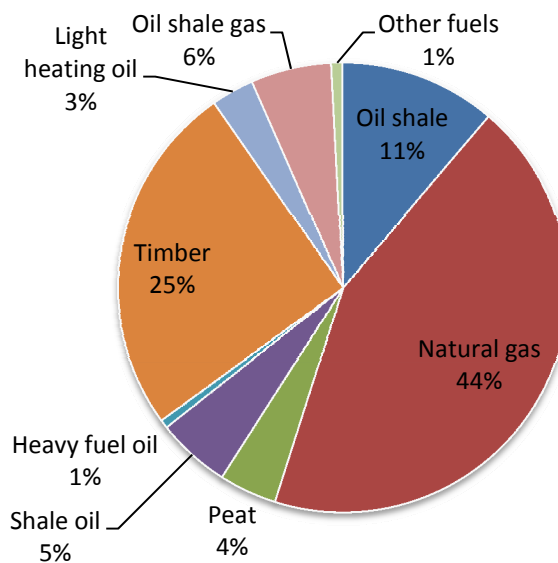
5. For instance, the EU legislation provides the development of efficient **electric power and heat cogeneration**, fostering of free competition, using energy more efficiently and employing renewable fuels. The EU legislation does not govern the heating supply sector directly.

District heating market

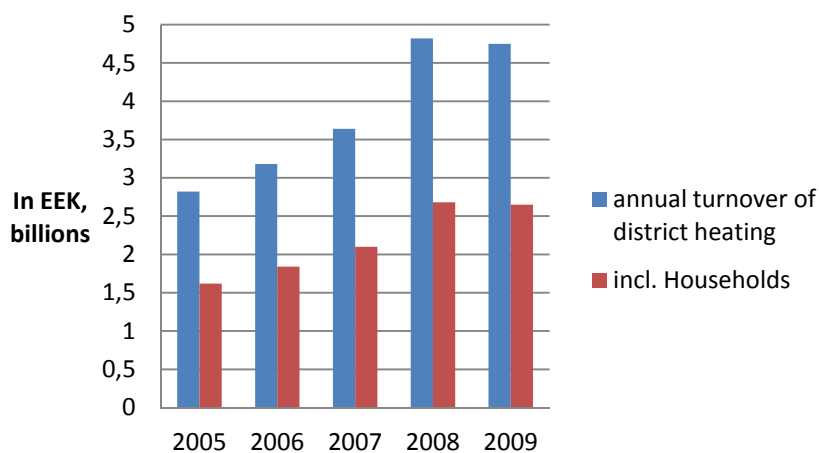
6. According to the responses received during the survey conducted by the NAO among LGs (hereinafter "LG Survey") in March-April 2010, there are 287 district heating boiler plants and at least 1447 km of heat pipelines in Estonia. All LGs responded, but 13 of them did not know the length of their district heating network.

7. In 2009, mostly natural gas, wood (wood chips, wood residues), oil shale, shale oil and peat were used in Estonian boiler plants and power stations, including combined power and heat plants. The shares of fuels are shown in Drawing 1. According to Statistics Estonia, 61 % of the heat was produced in boiler plants and 39 % in power stations.

¹ National development plan for the energy sector up to 2020.

Drawing 1. Share of fuels used in district heatingSource: <http://www.stat.ee>

8. In addition to households, district heating networks deliver heat to the industry, construction, agricultural and other sectors. From 2005 to 2009, the annual turnover of district heating, calculated on the basis of the amount of heat sold to consumers² and the average cost of heat,³ was EEK 2.8 to 4.8 billion (EUR 179 to 306.8 million). The share of heat sold to households has gradually increased, amounting to EEK 2.7 billion (EUR 172.6 million) in 2009 (see Drawing 2).

Drawing 2. Turnover generated by district heating

Source: NAO's calculations based on the data of Statistics Estonia

² Heat balance (district heating, consumption by households), Statistics Estonia.

³ Average cost of heat consumed by businesses, Statistics Estonia.

State's financial support to heating supply

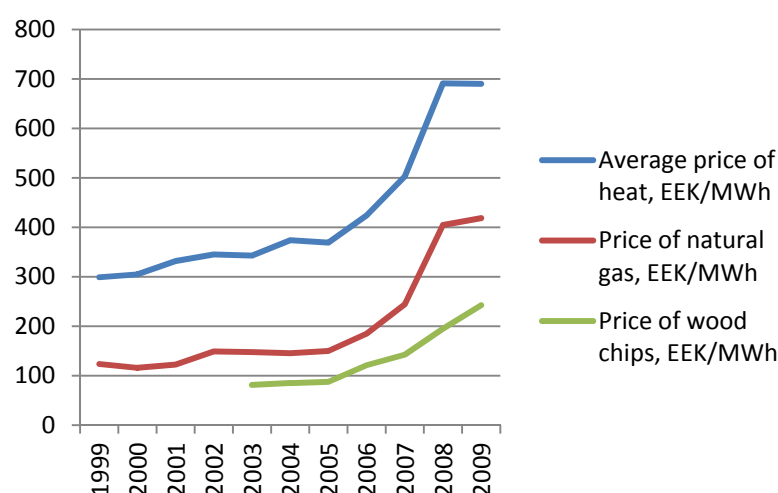
9. The state has supported the heating supply sector mostly through environmental protection and regional development objectives. From 2005 to 2009, the heating supply sector received EEK 217.3 million (EUR 13.89 million) from the European Regional Development Fund (ERDF) and from the Estonian environmental taxes, LGs received EEK 14.3 million (EUR 0.9 million) during the same period for investments in energy saving from the state budget and through the Support Scheme for Energy Conservation in Local Governments.

10. The initial plan for 2009-2013 was to grant EEK 1.064 billion (EUR 68 million) from the ERDF for promoting the use of renewable energy sources and protection of ambient air. In the first call for proposals in 2009, EEK 149.4 million (EUR 9.6 million) was awarded as grants through the Environmental Investment Centre (EIC) support measure „Increased use of renewable energy sources in energy production“, whereof EEK 59.4 million (EUR 3.8 million) was awarded for renovating heat networks and EEK 90 million (EUR 5.8 million) for constructing combined power and heat plants or converting the existing production systems for use of renewable fuels.⁴ Because of the economic crisis the rest of the ERDF money was reallocated to other sectors and the projects selected in the first call for proposals, which did not receive funding from the ERDF, will be financed from the sale of greenhouse gas assigned amount units (AAUs). In autumn 2010, a new call for proposals was announced which is also financed from the sale of AAUs. The amount available in the future for renewable energy sources and ambient air protection is not known as it depends on how the state is able to sell the AAUs.

Price of heat and pricing practices

11. The cost of heating forms the largest share of the population's housing expenses. The price of district heating in Estonia ranges from EEK 435 to 1470 (EUR 27.8 to 94) per 1 MWh plus VAT, depending on the producer and the fuel used. A major price increase (nearly double) occurred in 2006-2008 due to the soaring fuel prices. The dynamics of the prices of heat and of fuels most commonly used by the producers is shown on Drawing 3.

⁴ Financing decision for measure „Increased use of renewable energy sources in energy production“, Environmental Investment Centre, December 2009.

Drawing 3. Comparison of average price of heat and prices of most commonly used fuels⁵

Source: NAO's calculations based on the data of Statistics Estonia

12. The NAO compared the average price of district heating with electrical heating and found that district heating has been appr. 33 % cheaper (see Table 1). Although the average price of district heating has been lower than that of electrical heating, it turned out that in many regions district heating is more expensive than electrical heating. In 2010, the electrical heating package cost EEK 1100/MWh in the first half of the year. In 36 network areas (ca 25 % of all network areas), district heating⁶ was more expensive than electrical heating.

Table 1. Comparison of electrical and district heating prices

Type of fuel/energy	2007	2008	2009
Electrical heating package for households, EEK/MWh (EUR/MWh)	870 (55,6)	935 (59,8)	1045 (66,8)
Average price of heat, EEK/MWh (EUR/MWh)	503 (32,1)	691 (44,2)	690 (44,1)
District heating cheaper than electrical heating, in %	42%	26%	34%

Source: NAO's calculations based on the data of Statistics Estonia

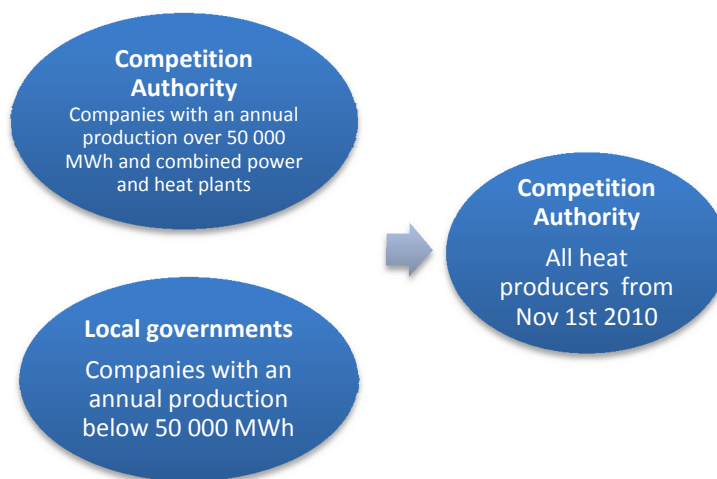
13. Since there is generally only one heating company in each area, the district heating suppliers are not operating in a competitive environment. But a company enjoying a monopoly position is not forced to be as efficient as possible. In order to ensure that consumers receive heat at justified prices the Estonian Competition Authority has to approve the sales price of heat applied by the suppliers.

⁵ The average cost of fuel and energy consumed by businesses broken down by type of fuel/energy, Statistics Estonia. To determine the cost of energy contained in the fuel the energy quantities contained in the fuels were calculated by using calorific values (applied calorific values: natural gas 1000 m³ = 9.3 MWh; wood chips (moisture content 40 %) 1 m³ = 0.8 MWh).

⁶ The price data for district heating have been collected by the Competition Authority from local governments.

14. Until Nov 1st 2010, approval was the task of LGs and the Competition Authority. Only heat producers which sold more than 50 000 MWh of heat annually or cogenerated electricity and heat, had to apply for approval from the Competition Authority (see Drawing 4). There were 18 such companies in Estonia and these operated in 42 network areas. Starting from Nov 1st 2010, when the amendments to the District Heating Act entered into force, which resulted from the Price Limitations on Monopolies Act, the Competition Authority approves prices for all heating companies.

Drawing 4. Approvers of heat prices before and after Nov 1st 2010



Source: NAO, relying on the District Heating Act and Price Limitations on Monopolies Act

15. According to the District Heating Act, the approval of the price of heat must take into account:

- the necessary operating expenses, incl. those for the generation, distribution and sales of heat;
- investments for meeting the operating and development obligations;
- costs of complying with the environmental, quality and safety standards; and
- justified profitability.

16. During the audit the NAO assessed the state's activities in ensuring the sustainability of heating supply, incl. the security of supply, the granting of financial support to heat producers, and the approval of prices. The audit focused on the generation and distribution of heat, it did not deal with the behaviour of heat consumers, for instance the energy performance of buildings.

District heating is not sustainable in every region, especially in those with few consumers

17. In densely populated areas (primarily apartment buildings in settlements), the people usually have no other option than to use the district heating with the given prices and quality offered in that area. The

price, convenience and quality of district heating must be equivalent to or better than the corresponding values offered by local heating devices (e.g. boilers, electrical heating, heat pumps). Otherwise, according to the free market rules, the residents should have the possibility to choose a cheaper heating alternative.

18. District heating is sustainable if it ensures a heating supply which is secure, reliable and efficient, with dispersed fuel risks and justified prices and meets the environmental standards and the needs of consumers. District heating can be successfully employed only in areas with a sufficient number of consumers and where the heating systems are constructed so that the heat can be produced and delivered to the consumers without unjustified costs and losses. Since the construction of district heating systems is expensive, their consistent maintenance must be ensured.

The heat supply systems are obsolete and the consumers pay for the resulting heat losses

19. The district heating systems and their components - boiler, heat network, etc - must be permanently in condition that allows generating and delivering heat to the consumers steadily without excessive losses and at justified prices. The greater the heat loss, the more fuel has to be burnt and the more expensive the heat will be for the consumers. The technical condition of district heating systems and the amount of resulting heat losses depends on the age of the system as well.

20. The development and maintenance of district heating systems is part of the infrastructure beyond the control of individuals and therefore the LG or the state must manage its operation. If the heating company and the LG are not able to keep the area's district heating infrastructure in good condition and district heating in the area is not sustainable, it must be replaced by a more suitable heating alternative.

21. Based on various data, the reasonable life span of district heating pipelines is up to 25 years and for boilers it is up to 20 years. The Competition Authority accepts an annual depreciation of 4 % in the case of new district heating pipelines which converts to a calculated life span of 25 years for the pipeline. According to the Estonian Power and Heat Association's survey,⁷ breakdowns of the heat network become more frequent and heat losses start to increase already from the 15th year of service due to exhaustion. In several larger district heating areas (incl. in Tallinn), timely renovation and replacement of the heat network is carried out to keep the service life of the pipeline between 20 and 25 years.

22. Heat losses of a heat network could be 10 % (e.g. district heating area of Mäetaguse Rural Municipality which has completely pre-insulated pipes) to 15 % (e.g. partly renovated pipeline in Tallinn), depending on the length of the pipeline. According to the Ministry of Economic Affairs and Communications, the attempt to achieve a heat loss smaller than 10 % is economically unreasonable in heat networks with few consumers who are located apart from each other - it is too expensive compared to

On the average, a pipeline lasts for 25 years, but from the 15th year breakdowns usually start to occur in the heat network.

Did you know that ...

in Finland, the heat loss in similar district heating networks is ca 6-7 % and in Sweden ca 7-9 %.

Did you know that ...

the Rural Municipalities of Kiili, Kuusalu, Laheda, Rõuge, Saarde, Tudulinna and Tõstamaa have approved a heat loss exceeding 30 % as part of their heat price.

LG Survey conducted by the NAO

⁷ Estonian Power and Heat Association „Mapping the development priorities of small Estonian heat producers and of the energy sector in rural areas“, Tallinn 2009.

Nearly 60 % of boilers are older than 20 years and 75 % of heat pipelines are older than 15 years.

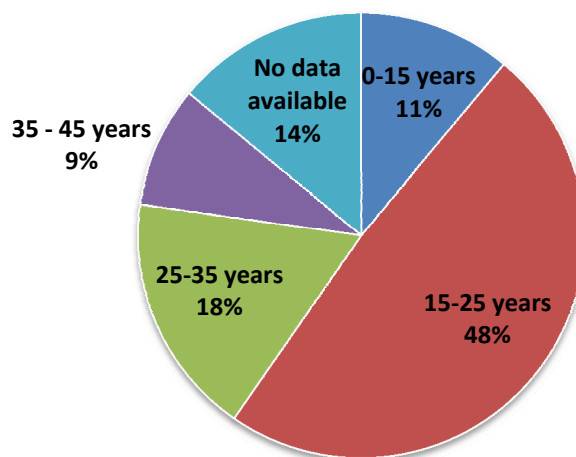
An over-dimensioned heat network is a heat pipeline designed and built for a considerably bigger consumption than actually needed – its excessive diameter does not allow maximum use of heat input to the network, thus resulting in major heat loss.

the achieved economy. A heat loss value of less than 10 % can be attained, but in this case the district heating system must be compact: a short heat network and many consumers connected thereto. As a rule, the Competition Authority accepts the heating companies' average heat loss of nearly 20 % upon approval of prices. Several LGs in the audit sample have not paid any attention to heat loss in the price approval process.

23. The service life of boilers is different, depending on the type of fuel and incineration technology used. For the price approval process, the Competition Authority accepts an annual depreciation of 5 % for new boilers which converts to an average service life of 20 years for boilers. According to the Estonian Technical Surveillance Authority, nearly 40 % of the boilers in use are older than 20 years and 20 % are older than 30 years.

24. The district heating systems in Estonia are usually designed and constructed during the Soviet era pursuant to the standards and technology applicable at the time and for far greater consumption, i.e. they are **over-dimensioned**. According to the LG Survey, the heat networks are over-dimensioned in 77 LGs, dimensioned as required in 36 LGs, and 38 LGs lacked an overview of heat networks on their territory. In addition, the survey revealed that 75 % of heat pipelines are older than 15 years on the average (see Drawing 5) which means that a large number of heat networks need investments for reconditioning in the nearest future.

Drawing 5. Age of heat pipelines



Source: NAO, on the basis of the LG Survey

More than 25 % of heat is lost in the heat networks of many LGs

25. In order to reduce heat losses the old pipes and their thermal insulation must be renewed or replaced with pipes which have a diameter corresponding to the consumption. Pre-insulated pipelines have been installed for already more than 20 years. According to the Competition Authority, 10 % of companies which had to get an approval for their heat price from the Authority, had installed pre-insulated pipelines. According to the LG Survey, pre-insulated pipes make up about 30 % of the total length of Estonian heat networks. A. Hlebnikov's Doctoral thesis shows

that after optimisation of the heat network piping and replacement with pre-insulated pipes of optimal dimensions it would be possible to reduce the relative heat loss in the Mustamäe-Õismäe and City Centre networks of Tallinn from 16-18 % to 7 %, in the Lasnamäe network from 20-22 % to 8 %, in the Võru network from 20 % to 9 %, and in the Kiviõli network from 26 % to 8 %.⁸

26. Due to the age and over-dimensioning of heat networks a large share of these are not efficient and give rise to major heat losses. According to the LG Survey, the heat network losses mostly remain between 10 and 30 % (however, in providing hot tap water during the summer season the loss may be as much as 80 % in some sections). In 28 LGs, the heat loss exceeded 25 %. The average heat loss of the country's heat networks calculated on the basis of the survey results has been rather high despite the investments made and amounted from 20.6 to 21.3 % during the audited period (see Table 2). 118 of the 151 respondent LGs which used district heating provided information on the amount of heat loss.

Did you know that ...

- For instance, in Ahja, Rõngu, Tori and Valgjärve Rural Municipalities the heat loss of the heat network is below 10 %.
- Among the larger district heating areas, the pipeline heat losses amount to 24 % in Kohtla-Järve, 20.1 % in Sillamäe, 19 % in Rakvere and 16.2 % in Tartu, for example.

LG Survey conducted by the NAO



The pipeline heat loss is especially visible in the winter season.

Source: toomas.trapido.org

The state lacks a comprehensive overview of the condition of heat networks

27. The NAO compared the LG Survey results with the information held by Statistics Estonia and the Competition Authority and concluded that because of major differences in data it is practically impossible to get an accurate overview of district heating, including the condition of the country's district heating systems and the amount of heat loss. According to LGs, the average heat loss in heat networks was 21 % in 2009, but NAO's calculations relying on the data held by Statistics Estonia showed a value of 11 %, and the Competition Authority estimates that it is ca 20 % (see Table 2). Statistics Estonia explained that their data does not provide an appropriate overview because the data on the generation and sale of heat includes all boilers in Estonia, including those not used to supply heat to the district heating networks. The annually published statistics on the heat generated and sold in the country (heat balance)

⁸ Aleksandr Hlebnikov 2010. Efficiency analysis and optimisation of Estonian district heating networks. Doctoral thesis, page 108. Mechanics Faculty of Tallinn University of Technology.

indicates only the amount of heat sold to district heating consumers - 6868 GWh in 2009 – this does not match the figure proposed by the Competition Authority (4544 GWh). Statistics Estonia does not publish separate data on the generation of heat and heat losses in district heating. This means that, to date, the Ministry of Economic Affairs and Communications has not ordered official statistics to be compiled on district heating, including the condition of networks, and thus such information is not available to the officials responsible for the development of that sector.

Table 2. Losses in heat networks

Source	2005	2006	2007	2008	2009
Statistics Estonia*	11,1%	10,7%	10,6%	10,3%	11,0%
Competition Authority	20,1%	20–21,8%**	–	20%	18,7%***
LG Survey	21,3%	20,8%	21%	21,1%	20,6%

* Losses in heat networks in % = loss in heat network ÷ generated heat × 100.

** Average heat loss in heat network which the Competition Authority has applied in the price approval process (the average for businesses shown to Võru Soojus AS during the approval process was 20 %, the averages shown to Fortum Termest AS and Kuressaare Soojus AS were 21.8 % and 21.2 %, respectively).

*** Average value communicated to the NAO by the Competition Authority which excludes extreme values which would excessively distort the average.

Source: Statistics Estonia, Competition Authority, LG Survey

The impact of investments on reducing heat loss in pipelines has been small.

28. According to the LG Survey, 81 of the 151 LGs using district heating have financed the reconditioning of heating supply from their own funds. As a result of investments, the average heat loss in the heat networks of these LGs has dropped by 2 % (from 25 % to 23 %). The negligible impact of investments can be attributed to the fact that in most cases the pipeline has been renovated in sections. In 101 LGs which did not invest in heating supply the losses have remained stable or increased.

Did you know that ...

consumers paid for the heat loss in district heating pipelines

- EEK 660 million (EUR 42.2 million) in 2008, and
- EEK 689 million (EUR 44 million) in 2009.

Source: NAO, based on the data of Statistics Estonia

29. If no money is invested in the heat supply systems, the heat loss increases year by year due to the aging of the heat networks. Since the heat loss is included in the price of heat, the consumer has to pay for it. The price of the heat payable by the consumers rises along with the increase in fuel prices and the deterioration of district heating pipelines. Consumers also cause heat loss, e.g. if the heated buildings are not insulated properly. This audit did not examine the heat loss occurring at the consumer's and its effect on the heat price.

30. NAO's recommendations to the Minister of Economic Affairs and Communications:

- In order to ensure the stable development and sustainability of heating supply, develop, and submit to the Government of the Republic for approval, a national heating supply development plan and its implementation plan in 2011. In the course of preparing this development plan, analyse the technical and financial situation of heating supply (incl. district heating), the need for investments and the investment capacity of businesses. Based on the results of the analysis, set goals and measures in the development plan for the reconditioning and development of the heating supply sector.

- Determine, in co-operation with Statistics Estonia and the Competition Authority, the need for statistical data and surveys in the field of heating supply, incl. district heating. The national statistics must reflect the situation of the heating supply sector adequately, allow formulating a policy for this field, and monitor the attainment of goals set out in national development plans.

Reply from the Minister of Economic Affairs and Communications:
We agree with the recommendations, the said proposal is also included in the Energy Sector Development Plan.

We agree with [the second] recommendation [also].

Some consumers are forced to be the clients of an inefficient heating company.

District heating region is a land area determined in the general plan where district heating is used to supply the consumers with heat.

31. By virtue of the District Heating Act, the state has given LGs the opportunity to establish **district heating regions** in order to ensure that heating companies have a stable client base and, above all, to create the preconditions for establishing power and heat cogeneration plants and thus developing more economical energy use.
32. According to the District Heating Act, all consumers who used district heating at the time of establishment of the district heating region are required to continue to use it. Since Nov 1st 2010, the consumers may, in addition to the heat delivered by the district heating network, buy thermal energy obtained from fuel-free and renewable energy sources. Furthermore, the LG may, by means of a regulation, provide for the possibility of opting out of the district heating region. Persons who did not use district heating at the time of establishment of the district heating region are not required to join the network.
33. The District Heating Act provides that before establishing district heating regions within its territory the LG must carefully consider whether district heating in the relevant area is reasonable and competitive and whether it provides the population with the best heating solution. To this end the following aspects must be analysed: the technical condition of the area's heat supply systems, the number of consumers and whether their number will increase in the future, and how much will the maintenance and renovation of systems cost. To protect consumers, the LG must establish quality standards for the service provided in the district heating region which, for example, establishes at what temperature the heat must be delivered to the consumers.
34. The Competition Authority is of the opinion that in small regions where natural gas or liquid fuel is used and where there is no perspective for conversion to alternative fuels or cogeneration of heat and electricity the discontinuation of district heating and the possibility of introducing local heating solutions should be considered.

Did you know that ...

a criterion for applying for financial support under the EIC support measure "Increased use of renewable energy sources in energy production" is the existence of a district heating region. This criterion was set because the committee which developed the measure thought that by establishing an area the LG is convinced that district heating is viable and sustainable in that area.

Most LGs which have established district heating regions have neither analysed the condition of heating supply in the area nor set quality standards for district heating.

There are no guidelines for establishing district heating regions

Did you know that ...

the Estonian Heat and Power Association is a voluntary organisation combining the energy sector companies which had 51 members as of October 2010. The objective of the association is to represent the common interests of companies operating in the energy sector and share know-how and experience.

35. The LG Survey demonstrated that many LGs have not shown particular interest in regulating the energy sector and district heating and that they lack sufficient expertise to deal with these issues. 106 LGs out of 151 have established a total of 164 district heating regions. 45 LGs which use district heating have not established regions. In most cases, the LGs have not considered the condition and development opportunities of heating supply in the area or alternative heating solutions before establishing district heating regions. This is further supported by the fact that 10 LGs out of 16 included in the NAO's audit sample do not have an energy sector development plan. Six LGs did have a development plan but with shortcomings. For example, only four of the examined development plans compared the cost of district heating with that of alternative solutions. According to the survey, only 11 % of LGs (12 LGs out of 106) have comprehensively analysed all the circumstances before establishing district heating regions. 36 LGs have established regions on the request of the heating company and 9 have done so in order to receive financial support.

36. Furthermore, some LGs within the NAO's sample had not set standards to ensure service quality, thus allowing the agreement between the producer and the consumer to govern the quality of district heating. One exception is Tallinn where service levels have been set for district heating network operator and where compliance therewith is monitored. If no quality standards have been set, the LG has limited possibilities to monitor the activities of a heat producer on its territory. In that case it is also impossible to require the heating company to invest in heat generation and distribution in order to make it more efficient (especially if it is a private company).

37. By giving the opportunity to establish district heating regions the state wanted to promote the cogeneration of electricity and heat and increase the share of renewable and local fuels in district heating, but has failed to elaborate clear guidelines for determining the areas where district heating regions can be introduced. The Ministry of Economic Affairs and Communications hoped that as the district heating networks and settlements are different, the LGs will analyse the situation of heating supply before establishing the regions and will establish them only if district heating is sustainable and its use is financially justified.

38. The only thing that the LGs can rely on in establishing district heating regions is the guidelines developed by the Estonian Power and Heat Association (EPHA) in 2004 with financial support from the Ministry of Economic Affairs and Communications. The guidelines describe the advantages of district heating compared to local heating and contains sample texts of the minutes of sessions and council regulations and explanatory memorandums needed for LGs to establish district heating regions. According to the guidelines it is not wise to convert to local heating in areas with existing district heating and it recommends gradual renovation of the existing district heating network and substations. The document does not address the sustainability criteria for district heating regions or the need to consider the practicability of district heating before establishing a region. Thus, in the NAO's opinion, the EPHA's guidelines rather have the effect of fostering indiscriminate establishment of district heating regions.

On the district heating market, creating a competitive environment is complicated or impossible

Did you know that ...

- there are 35 privately owned heat networks;
- there are 83 heat networks owned solely by LGs and 6 networks owned jointly by an LG and a private company;
- in 22 LGs, the heat network is owned by the LG, but leased to a private company.

The development of heating supply has not been planned on national level

Operational continuity is the ability of the service provider to operate continuously and resume continuous operation after disruption.

39. The NAO finds that in the process of establishing district heating regions the LGs had the option of conducting studies to determine non-sustainable networks which should be replaced with cheaper alternative heating solutions to protect the interests of consumers. Since the state did not assist the LGs in establishing district heating regions, this option was not used and the residents are forced to use district heating in regions for which it is not known whether district heating is the heating solution with the best price and quality ratio.

40. If the LG has set standards for the provided service and its technical and economical efficiency upon establishing the district heating region, the local heat producer must, where necessary, invest in new production equipment or the heat network to reduce heat loss. If the current heat producer fails to do so, another producer who is able to provide cheaper heat should have the possibility to enter the market.

41. The District Heating Act which was in force until Nov 1st 2010 did not foster competition or regulate the market access for new producers. As the heat production and the distribution network are often owned by the same companies enjoying the monopoly position, new heat producers have no other alternative than to sell heat to the currently operating heat network. But this could be done only with the agreement and on the conditions set by the monopoly.

42. In the long run this problem could be alleviated by the amendments to the District Heating Act ensuing from the Price Limitations on Monopolies Act which entered into force on 1 Nov 1st 2010. These amendments grant the Competition Authority the right to take control action requiring the network operator in an inefficient region to publish a competition call for finding a heat producer. Another amendment provides that the contract between the network operator and the heat producer must be made for a period of 12 years. The NAO finds that these amendments will have the desired effect only if the heat producer and the operator of the heat network are separate companies, since in that case the network operator could be interested in finding a new and more efficient heat producer. However, the separation of networks from production is justified only in large district heating regions.

43. The described problems are due to the fact that the state has not prioritised district heating and has left it mostly to the discretion of LGs. The audit revealed that the LGs do not always recognise their responsibility as the guarantors of **operational continuity** of heating supply. Some LGs are not aware of or interested in the development of district heating due to the privatisation of heating infrastructure. The state is expected to interfere more and set out the development lines in a national development plan. As it is, the comprehensive analysis and resolution of countrywide district heating problems is the duty of the state, and not the LGs.

44. On the national level, there is still no comprehensive perspective as to the development of heating supply. The Ministry of Economic Affairs and Communications was supposed to prepare an overview of district heating problems and analyse these by January 2010. According to the Energy Sector Development Plan, the next step was to develop the National Development Plan for the Heating Sector by December 2011, but as of the moment no efforts have been made to this end. According to

the Ministry, they wanted to wait until the results of the NAO's relevant audit are published before drafting the development plan.

45. As the Ministry of Economic Affairs and Communications has not co-ordinated the establishment of district heating regions in LGs, such regions might have been established in places where district heating is not the best heating solution for the local population. And according to the spirit of the District Heating Act, the district heating region residents are required to use district heating even if the heat has been produced and distributed inefficiently and it's more expensive than other heating alternatives. If the heat networks in the district heating region and the production are inefficient and if reconditioning investments are not made or companies producing heat at lower prices are not allowed to take over the production, the heat price for the consumers will continue to rise in the future.

46. NAO's recommendations to the Minister of Economic Affairs and Communications: Take the following actions in order to maintain district heating and ensure its development (incl. construction of cogeneration plants) in viable regions:

- In the year 2011 develop, criteria and instructions for establishing district heating regions. The criteria must allow clear and unambiguous assessment as to whether the district heating region established or to be established is practicable and sustainable. Set the existence of energy sector development plans or studies as the precondition for establishing district heating regions in LGs whereby such plans or studies must compare district heating and its alternatives based on environmental and financial aspects, and prove the sustainability and justify the use of district heating.
- In co-operation with the Competition Authority and LGs carry out analysis which determines whether the district heating regions established by LGs are justified in the year 2011.
- Supplement the District Heating Act with legal bases and actions in order to annul district heating regions which have been established thoughtlessly and do not meet the sustainability criteria.

Reply from the Minister of Economic Affairs and Communications:
We agree with the recommendations in part.

The Ministry of Economic Affairs and Communications (MEAC) finds that the establishment of district heating regions is justified. However, the criteria for determining sustainability cannot be clearly defined. With respect to the criteria for assessing district heating addressed in the survey „Mapping the development priorities of small Estonian heat producers and of the energy sector in rural areas” conducted in 2009 by the Estonian Power and Heat Association (in collaboration with the specialists of MEAC and the Tallinn University of Technology) it was concluded that the practicability of introducing or discontinuing district heating can be determined only on a case by case basis for each specific settlement, taking into account a great number of factors with economic aspects mainly being the decisive ones.

In the price approval process, little attention has been paid to the need to make district heating more efficient and maintain its sustainability

47. In densely populated areas, especially cities, there are currently no realistic alternatives to district heating – therefore it must be ensured that heat can be produced and delivered to the consumers efficiently and without major heat losses also in the future. The state's responsibility and essentially the only way to protect the consumer is to control the heat price by applying the approval procedure. The price at which heat is sold to consumers must be set so that it would not be higher than that of the potential alternatives and that it would cover the expenses necessary for production and the maintenance of equipment and facilities or the acquisition of new ones. The District Heating Act provides that in order to achieve and maintain technical and economic efficiency the heat price must include, in addition to the operating costs, the required investments as well as expenses and investments necessary to meet the environmental, quality and safety standards.

48. To ensure the necessary investments the price approval process must include an analysis as to which price level allows providing a service that conforms with the District Heating Act, and maintaining district heating in the future as well. In doing so the regulator of the price must check that the price does not include unjustified expenses (incl. investments). The need to evaluate investments and assets has been pointed out also by the World Bank in its guidelines for price regulators,⁹ where it is provided that the approval process should include an evaluation of the company's investment plan and the necessity of investments.

It is not known what the heat price should be in order to cover the necessary expenses and allow making investments

49. In the course of the audit the NAO found that the LGs included in the sample had not analysed the price approval applications lodged by the companies. Thus, it was not possible to assess whether the LGs have paid sufficient attention to the companies' investments during the approval process. Issues related to the price approval process in LGs have been addressed in paragraphs 119 to 125.

50. The documentation on price approval held by the Competition Authority revealed that it has not analysed the price level at which the company would be able to provide a service conforming to the District Heating Act and ensure the sustainable functioning and development of district heating. In the sample the NAO analysed the documents of 82 price approval processes for six companies throughout the years 2005 to 2009 within the area administered by the Competition Authority. The approval process has mainly been focused on the justification of revenue and expenditure, neglecting the assessment of the need for investments.

The Competition Authority has not thoroughly checked the necessity and justification of heating companies' investments

51. In order to include investments in the heat price the Competition Authority has in most cases asked the companies why they need to make those investments, but more thorough checks (incl. inspection of accounting documents and price offers) have not been conducted. On one occasion, a heating company had, during the approval process, submitted a statement announcing the successful tender as regards the investment in question. One example showed that the Competition Authority had

⁹ Resetting Price Controls for Privatized Utilities. A Manual for Regulators. Economic Development Institute of the World Bank.

requested justification for investments only until the company had attained a level of production efficiency acceptable to the Authority (heat loss in the heat network remained below the average for companies). In later approval processes, the requested investments were included in the price, but the documents did not indicate that the Authority had required the company to justify those investments. However, when examining the justification of fuel prices, for example, the Authority has in most cases required the companies to furnish documents of offers submitted in response to invitations to tender.

Did you know that ...

in the course of the price approval process, many companies have informed the Competition Authority in writing that it is impossible to produce heat at the cost level required.

52. The Competition Authority examines whether the investments made allow to produce heat more efficiently, but does not assess whether the level of efficiency thus achieved is sufficient. For the audited period the Authority did not know how large investments would be needed to ensure the maintenance of equipment and more efficient production of heat. The Authority commissioned a study to determine the construction cost of boilers which was completed in 2010. As the audited period (from 2005 to 2009) did not overlap with that study, the NAO did not examine whether the Authority has made changes in the price regulation process on the basis of the study results since. The Authority has not commissioned general studies on the cost of renewing heat networks.

53. Furthermore, the audit revealed that the Competition Authority price approval principles did not include guidelines for assessing the necessity and justification of investments. Currently, investments are included in the heat price in the form of **capital depreciation** of fixed assets. According to the Authority, the drop in the efficiency indicators of equipment and the total amount of capital depreciation indicates that the company needs investments (efficiency values go down as the equipment ages). However, the analysis of the documents on price approval processes relating to companies in the sample showed that the Authority has not examined whether investments in the amount of capital depreciation are sufficient to ensure the sustainability of district heating and how the recognition of optimal level of investments would affect the price of district heating.

Capital depreciation – decrease in the value of assets due to wear.

54. Although according to the principles of approving heat prices the purpose of capital depreciation is to recover the fixed asset acquisition expenses during the service life of the equipment, the Competition Authority did not calculate the actual age of equipment for the companies in the sample (with one exception) but applied the average value established by the Authority both to new and old fixed assets (depreciation rate of 6.7 % for old fixed assets, and 4 % for new ones) instead. The Authority argues that the average value originates from a study¹⁰ by the Tallinn University of Technology which addresses the evaluation of the useful life of machinery and equipment of power companies. What comes to heat generation equipment, the study addresses only new equipment. Thus, the capital depreciation value for old fixed assets applied by the Authority in the price approval process can not be based on the said study.

¹⁰ Defining the capital depreciation of fixed assets of Fortum and Narva Elektrivõrk. Calculating capital depreciation in the generation of power and heat, and gas supply, Tallinn University of Technology, 2003.

The actions of the Competition Authority do not always ensure that the district heating area becomes more efficient - low heat price is more important

55. Although during interviews the officials in the Competition Authority have underlined that the aim of the Authority's work is to improve the efficiency of heating supply, the audit results did not always support that. The analysis indicated that the Authority has not requested companies to put in place action plans to reduce inefficiency or required them to invest in improving efficiency. Instead the companies were induced to recognise the cost level acceptable to the Authority in their pricing. Immediate cost savings were required without granting any time for making the production more efficient and achieving those cost savings. The Authority finds that this is the only way to force the companies to improve efficiency.

56. In 2009, the Competition Authority set out in the price approval principles the overall permissible heat loss in a heat network (see Table 3) and the efficiency values of boilers which the companies have to achieve and the corresponding costs which the Authority deems eligible for price approval purposes. The documents on approval processes further showed that from 2005 to 2009 the Authority had already demanded a cost level corresponding to values stricter than the established limits.

Table 3. The maximum rates of heat loss in heat networks set out in the price approval principles of the Competition Authority which the companies must comply with

Year of applying the maximum rate of heat loss in heat network	Maximum rate of heat loss in heat network
2009	24%
2010	22%
2011	21%
2012	20%

Source: Price approval principles of the Competition Authority in 2009

57. The problem is illustrated by an example in Harju County area where the heat producer changed and the technical condition of the network in the area was bad: heat transmission entailed major heat loss, there were frequent breakdowns in the main pipelines of the heat network and the boiler showed signs of metal fatigue. The Technical Surveillance Authority required the replacement of the boiler. Under these technical circumstances the company was unable to produce heat and deliver it to the consumers whilst maintaining the average cost level calculated by the Competition Authority. During the price approval process the Competition Authority gave the company a choice: either the price will be approved with reference to the average cost level of heating companies or the Authority will not include the investment need in the price. Inclusion of costs and investments above the average for companies would have led to an increase in the heat price payable by the consumers. The company sent a letter to the Authority asking how the situation could be improved without investments but did not receive a reply. In this example, the Authority approved the company's heat price based on actual costs but excluded investments. The Authority justified the exclusion of investments by arguing that onsite inspection showed that the company had not started with the construction of the new boiler plant. The NAO notes that for other companies investments had been included in the price before they were actually made.

Competition Authority has encouraged companies to use non-renewable resources

58. In addition, the audit revealed that during price approval the Competition Authority had not taken the priorities of national energy sector into consideration. Although the state aims to achieve an increase in the share of renewable energy sources by 25% by the year 2020, some documents of price approval process indicate that the Competition Authority has encouraged the company to use non-renewable peat instead of renewable wood chips, as the former was cheaper. Likewise, pollution charge, i.e. the price of environmental tax, was not calculated for the period of 2006 to 2007 for companies participating in the European Union (EU) emissions trading. It was suggested that the companies paid their CO₂ pollution charge from funds obtained from the sale of CO₂ quota. The NAO notes that according to the idea behind the EU emissions trading system, funds obtained from a potential sale of CO₂ quota should be intended for investments aiming to reduce greenhouse gas emissions. The topic of CO₂ trading has been addressed in detail in the 2009 audit of the NAO "State's efforts of reducing greenhouse gas emissions". According to the Competition Authority, they must choose between protecting consumers' interests and taking into consideration the national priorities. As said priorities have not been stipulated with legislation, protection of consumers' interests is preferred.

Only the pricing principles of large companies are thoroughly checked by the Competition Authority

59. According to the Competition Authority, priorities have been set for the activities of the authority within the scope of limited resources, and the expenses of companies with largest expenditure (e.g. Tallinna Küte, Fortum Tartu, Narva Soojusvõrk, Kohtla-Järve Soojus) have been checked in detail. Competition Authority also explained that in the past companies had to submit long-term investment plans (business plans). This request was dropped as the companies' plans had not been thorough and contained inaccurate data, the checking of which was complicated and time consuming.

60. Furthermore, Competition Authority has explained that pursuant to the Competition Act it is their duty to check whether or not companies enjoying monopoly position have established too expensive prices for consumers. Pursuant to the District Heating Act and classical regulation theory the authority responsible for price approval shall also check whether or not the price ensures sustainability and that the price is not too low. Competition Authority is of the opinion that it is not its duty to carry out a more detailed analysis of the need for investments as it is established by legislation that the Authority's capacity in imposing development obligations on a company to ensure sustainability is limited. Pursuant to current regulation, companies must require the imposition of development obligation in their activity licences.

61. According to the NAO, the activities of the Competition Authority, which include observing whether or not the company makes investments at least within the scope of ageing of fixed assets, do not provide enough information on the company's need for investments, sustainability and on whether the company is able to generate heat in the years to come. As the data used in price approval may not indicate the actual age of company's assets and do not provide a comprehensive overview of the technical condition of equipment and heat network, the actual need for investments must be evaluated in order to ensure companies' sustainability. If expenses related to the technical efficiency of heat generation (e.g. network heat loss or boiler efficiency) were reduced without leaving time

Economic coping capacity of district heating companies is different

for making investments and actual savings, the economic and technical situation of district heating companies would deteriorate.

62. Analysis of those companies in the sample that belong to the area of administration of the Competition Authority revealed that according to the annual accounts the actual business profit of some companies is from 30 to 70 % of the profit allowed by the Competition Authority.¹¹ The analysis of the companies' financial ratio revealed that two companies are having liquidity problems and problems with discharging their financial obligations.

63. Among other things, the companies' different coping capacities are due to the fact that the Competition Authority does not carry out a retroactive cost-benefit analysis of the companies and fail to take said analysis into consideration during price approval process, which is why there is no information on how price approval has affected companies, district heating sector and its sustainability. From the consumer's viewpoint, companies' financial problems mean that the company's capacity to generate heat is at risk and consumers have to pay for growing inefficiency.

64. NAO's recommendations to the Minister of Economic Affairs and Communications:

- To ensure preservation and development of district heating (incl. construction of cogeneration plants) in viable regions:
 - supplement District Heating Act so that during the price approval process the regulator of the price is required to take into consideration the national priorities of the energy sector;
 - analyze the nature of the role of price approval in ensuring the sustainability of heating companies and the scope in which the Competition Authority has to assess the need and justifications for investments during the approval process; develop and record instructions for investment assessment in the guidelines for the approval of the price of heat (see also Clause 117).
- To provide an overview of district heating market, its need for investments and coping of companies, request that the Competition Authority analyses the sustainability and coping capacity of district heating companies and take the results into consideration upon price approval.

Reply from the Minister of Economic Affairs and Communications:
We agree with the recommendations in part.

Need for amendments to the Act shall be taken into consideration during the development of the National Development Plan for the Heating Sector.

¹¹ The Competition Authority allows a profit margin of about 7,5 to 9 %, which is calculated with reference to invested fixed assets on the basis of yield, government risks and other indicators of German government bonds (WACC).

65. NAO's recommendations to the Director General of the Competition Authority:

- To ensure efficient generation of heat in a longer perspective assess the company's need for investments and its implementation, incl. require the heating company to draw up a long-term investment plan, highlighting potential efficiency achieved with investments and assessment of their impact on the price of heat.
- In the future, to identify the impact of price approval, analyse companies' revenue and expenditure retroactively. On the basis of analysis, assess whether companies are sustainable and have coped with the approved price when selling heat.

Reply from the Director General of the Competition Authority:

Activities related to the implementation of price regulation recommended by the NAO have been put into practice by the Competition Authority for some time. Both ex-ante and ex-post checks are used to check the companies' revenue and expenditure and these checks are carried out with the help of respective surveys that have been drawn up in relation to price approval. During the price approval process both previous expenditure and estimated future expenditure are assessed.

In many cases the situation of heating supply is poor and little has been done to improve it

Financial support for sustainable heating supply systems is not sufficient

66. As the district heating sector has an impact on more than half the population of the state, support measures should be developed for necessary investments in viable regions where there are enough consumers but no serious alternatives for district heating and where the equipment and heat network are in a poor condition. Prior to the development of measures the state must be aware of the situation of heating supply and the capability of companies to self-finance the upgrading and later maintenance of equipment. Trends set in national and local government development plans should be followed upon the development of measures and reconstruction of district heating systems and the region's viability, need for investments and the company's capability to make investments must be taken into consideration. Allocation of financial support must be justified, market participants should be treated equally and allocation must be transparent.

67. With the energy sector development plan the state has undertaken an obligation to compile a development plan for the heating sector, the main objective of which is the need to diversify the energy sources used upon the generation of heat. Preparatory activities for the development of the development plan include identification and analysis of problems in the field of district heating.

Did you know that ...

state support for heating supply is 36 times less than its financial support for water and sewerage supply.

68. Although the condition of district heating networks deteriorates every year and heat loss generated in the pipeline forms ca one fifth of the price of heat, the state has failed to pay attention to the heating supply sector and has not supported it. In the period from 2005 to 2009 the state allocated EEK 231.58 million (EUR 14.8 million) to heating supply. However, in the period from 2004 to 2010 the state allocated (both as own self-financing and from European Union Structural Funds) ca EEK 8.1 billion (EUR 517.7 million) to the renovation of water and sewerage lines. The references above are to approved financing decisions not to

allocated sums. Financial support to heating supply is poor because the European Union as a whole does not have common interests in the field of district heating, nor has it laid down requirements for the development of said field. Thus, Estonia has decided to allocate support to water and waste management.

The state does not have an overview of how much money is needed for the renovation of heating supply

69. The audit revealed that the state does not have an overview of how many investments the heating supply sector would need and whether said investments could be made by companies themselves or do they require state support, as well as how the renovation would impact the price of heat. According to the National Development Plan for the Heating Sector (until 2020), the Ministry of Economic Affairs and Communications was required to identify and analyse the problems in the field of district heating by January 2010. This has not been done. It became clear from Clauses 47–63 that there are many cases where, during the approval process of the price of district heating, attention has not been paid to the assessment of the companies' need for investments although this is more or less the state's only opportunity to get a thorough overview of the condition of heating supply and if necessary, encourage companies to make investments.

Investments in district heating amount to an estimated EEK 11.2 billion (EUR 715.8 million)

70. With the LG Survey the NAO aimed to identify the need for investments in the district heating sector. Ca 70 % of LGs using district heating responded to the survey and it became clear that boiler plants would need investments of EEK 1.6 billion (EUR 102.3 million) and heat networks EEK 7 billion (EUR 447.4 million). Assuming that the need for investments is similar in all heat networks, the estimated total of investments in the state is EEK 11.2 billion (EUR 715.8 million). According to the NAO analysis, LGs and heating companies are not capable of making such investments on their own in the near future and with current heat price level. Taking into account the annual depreciation costs of fixed assets of all district heating companies (ca EEK 301 million (EUR 19.2 million) in 2008¹²), it would take at least 36.5 years for the companies to invest EEK 11.2 billion (EUR 715.8 million) on their own. However, the average lifetime of the companies' equipment should be 20 to 25 years.

Heat supply has mostly been supported through the development of renewable energy

71. Heat supply has mostly been supported through the Environmental Investment Centre. As the funds allocated as financial support are intended for making environmental investments, the terms and conditions of measures have been based on the compliance with environmental requirements and do not take into consideration the monopoly position of heating supply companies, ownership issues of heat networks and equipment, or their sustainability. The NAO analysed the terms and conditions for the allocation of support through the most recent and, up to now, financially the largest renewable energy measure, and identified shortcomings: characteristics of the heating supply sector had not been taken into consideration, or the support contributed to undesirable market development. The following examples can be provided to illustrate this:

- The main criterion for project selection was the reduction of CO₂ emissions, which is important for the environment but does not take into

¹² Commercial Register consolidated data for companies engaging in the generation and distribution of heat (EMTAK 3530).

Did you know that ...

It was decided to finance 42 heating supply projects through the support measure "More widespread use of renewable energy sources for the production of energy".

21 projects were financed in round I in December 2009, amounting to EEK 149.5 million (EUR 9.6 million).

Another 21 projects were financed with the second financing decision of the same round, amounting to EEK 168.8 million (EUR 11.9 million).

II application round has also been declared.

account economic or social aspects of district heating. It was difficult for projects aimed at decreasing heat loss in heat networks to compete with projects of combined power and heat plants as the latter contribute more to the reduction of the load on the environment. In the first round, 52.3 %, i.e. EEK 78.2 million (EUR 5 million) of the total funds was allocated to the projects of cogeneration plants. Most of the applications that were granted a conditional financing decision in the first round and were waiting for additional funds, were projects aimed at heat network renovation.

- Märajamaa Rural Municipality established a district heating region in the small town of Märajamaa due to a demand of the heat producer who wished to receive financial support. Likewise, another heat producer, because of the terms and conditions of the measure and after consulting the assessment committee of the EIC, requested the city government to establish a district heating region.
- The final version of the measure did not include enough requirements for the assessment of the sustainability/viability of the project and applicant, and many requirements that had been considered in the beginning were omitted for various reasons. For instance, the development committee of the measure considered it too complicated to calculate the projects' revenue and expenditure, although guidelines for said calculations had already been drawn up and published on the EIC website. According to the Ministry of the Environment, the sustainability of projects and applicants are ensured by allocating support on the basis of projects' expense receipts. Some applicants are required to first make all self-financing payments. The NAO notes that such requirement is not included in the measure regulation and this can come as a surprise for the applicant and lead to abandoning the support and failing to make the investment.

72. The NAO is of the opinion that the main reason for shortcomings in the measure developed for allocating financial support is the fact that the representatives of the Ministry of Economic Affairs and Communications failed to provide a sufficient explanation on the characteristics of the district heating market to the working group responsible for developing of the measure. This working group included representatives from the Ministry of Economic Affairs and Communications, Ministry of the Environment, Ministry of Finance, Ministry of Agriculture, Ministry of Education and Research and the EIC.

73. In addition to problems in the development of the measure regulation, the audit also identified shortcomings in the EIC in relation to checking the applications:

- As the requirements of the measure were not sufficient for the assessment of sustainability, the EIC did not perform thorough checks of the applicant's financial capacity for implementing the project. For instance, in two of the seven cases that were audited, certified statements that confirmed the availability of funds for a different project were accepted as documents certifying self-financing capacity for the project at hand.
- Likewise, an applicant who was a tenant and not the owner of the object to be renovated was considered compliant with the requirements in the round of application; although the measure

There were problems with assessing the applications for financing

regulation established that only the owner of a boiler plant or a heat network could apply for financial support.

- Upon calculating the final scores of applications and drawing up the ranking, the EIC employees had included an application that was not in compliance with the requirements of the measure as the bankruptcy proceedings of the company were going on, submitting the application. The EIC was aware of this fact but it failed to take it into consideration when drawing up the final ranking. At first, this project received the highest score and in the final ranking the scores of other projects were based on its score.

74. External assessors employed by the EIC also failed to adhere to the assessment guidelines and thus some of the decisions to allocate funds were not justified. In some cases assessment points were given contrary to the assessment guidelines. For example, in three cases out of 13 that were audited a maximum score was given for the applicants' financial capacity for a promise of loan by its mother company. According to the NAO the assessment guidelines would have allowed to give a maximum of 75 % of points in such case.

Ministry of the Environment also identified many infringements

75. At the time of the NAO audit the Ministry of the Environment carried out a monitoring of the assessment of renewable energy measure applications. According to the reference calculation of the Ministry of the Environment scores were not accurately calculated for some of the applications. However, as the final scores were formed on the basis of application ranking, the assessment scores of all 42 qualified applications changed. Among other things, the ministry identified that due to errors in assessment there were six applications who had received funds but should not have in the first round, and two applicants who should have received funds in the first round did not. The EIC explained the problems identified during monitoring with the employees' lack of experience in this field, and with the fact that they did not have time or competence for checking the work of external assessors.

76. The NAO also found that errors in the assessment of applications were mostly due to the fact that the EIC had not carried out a sufficient check of application documents. Also, some external assessors had been negligent in performing their duties. Two assessors did not possess the level of competence required at the competition of assessors, and the pairs of assessors for the assessment of projects were not formed by common rules. While the principle of forming the pairs of assessors first stipulated that a pair should consist of a national official and external assessor, the most expensive projects for cogeneration plants were assessed only by two external assessors on their own request. According to the head of the assessment committee, the assessment committee approved the formation of such pairs.

77. If requirements set for granting support cannot be complied with or lead to undesirable changes on the market, it will, according to the NAO, put heating companies and their consumers in an unequal position, because the investment often depends solely on the reception of support. Although the objective of the renewable energy measure is wider than just eliminating inefficiency of heating companies, the target group mostly included producers of heat. Thus the characteristics of the target group should be taken into consideration when drawing up the measure

regulation and allocating funds. Poor monitoring of companies' sustainability upon allocating support may lead to a situation where projects are not implemented and the funds remain unused temporarily or permanently. In addition, support may be granted to regions where district heating is not the most effective means of heating. Reduction of environmental impact in an unsustainable district heating region does not lead to an increase in efficiency and consumers' well-being but is a waste of money.

78. Considering the technical condition of heating supply and the need for investments, the state's support for heating supply has been poor and so far the only support measure aimed at improving renewable energy has not been enough to help to organise the field. As many inhabitants of Estonia are dependent on district heating and the heat loss in heat networks and inefficient production cost a lot, the state should consider options to make viable district heating regions more efficient or implement alternative means of heating in unviable regions.

79. NAO's recommendations to the Minister of the Environment and the Minister of Economic Affairs and Communications:

- When drawing up support measures for the heat supply market, consider the following:
 - Ensure that the measure takes into account the characteristics of the heat supply market, e.g. its monopolistic nature, ownership issues and sustainability.
 - Allocate financial support only to sustainable network areas and projects. To assess the projects' sustainability, ask the applicants to submit a cost-benefit analysis. To assess the sustainability of network areas, ask the applicants to submit proof for that.
- To ensure correct allocation of support, carry out regular supervision over the proceeding of applications for heating supply support.

Reply from the Minister of the Environment: Terms and conditions of the measure "More widespread use of renewable energy sources for the production of energy", established by Regulation No. 14 by the Minister of the Environment on March 24th 2009 (hereinafter measure regulation) are first and foremost aimed at reducing CO₂ emissions and ensuring security of supply. Thus, certain characteristics of the heating supply market were not thoroughly taken into consideration. Once the application rounds are completed we shall have much more experience in considering the market situation. In the future, when drawing up measures for the heat market we shall collaborate closely with the Ministry of Economic Affairs and Communications, Competition Authority and Environmental Investment Centre (hereinafter EIC) to develop such terms and conditions for support that would take into account the NAO's recommendations. We are also hoping to get assistance from the guidelines that the NAO suggested for the Ministry of Economic Affairs and Communications to develop in 2011, and shall lay down criteria for establishing district heating regions pursuant to Clause 46 of the report.

Ministry of the Environment carries out supervision pursuant to §30(1) of the 2007–2013 Structural Aid Act. The aim of supervision is to check whether the support is granted and used purposefully and in compliance with legislation. Supervision is carried out by the Supervision Bureau of the Foreign Financing Department of the Ministry of the Environment.

According to the procedure for supervision over the grant and use structural aid, approved on 27.10.2010, the EIC shall begin supervision activities as soon as proceedings start for granting the support and last for at least 5 years after the implementation of the project funded from structural aid is complete.

Supervision over granting support includes supervision over the declaration of application rounds, establishment of application assessment committee, application proceeding process (conformity and substantial assessment) as well as over the lawfulness of adoption of decisions to accede to/deny an application, amendment of the decision to accede to an application and revocation of the decision to accede to an application. In the course of supervisory activities the supervisory official shall monitor:

- the EIC's activities in declaring application rounds;
- application proceeding process from the registration of application to the adoption of a decision to accede to an application (incl. conformity assessment sheets and protocols, substantial assessment sheets and protocols, project ranking drawn up by the EIC and documents serving as the basis for decisions);
- uniform understanding of the members of assessment committee of the assessment criteria and ensuring of the equal treatment of applicants;
- establishment of the assessment committee and impartiality of its members;
- compliance of the decision to accede to an application to the terms and conditions laid down in the measure as well as to the Structural Aid Act and other relevant legislation;
- EIC's activities in organising and conducting the assessment.

In addition to the above, representatives of the Ministry of the Environment shall take part in the meetings of the assessment committee to ensure correctness in granting of support.

Reply from the Minister of Economic Affairs and Communications:

While we generally agree with the recommendations we would like to note the following:

- the terms and conditions of the measure upon supporting the heating sector depend on the objective of the support programme; those in turn depend on energy and climate policy objectives. Particular attention should be paid to EU objectives of compulsory nature such as the renewable energy objective arising from the renewable energy directive and objectives arising from climate policy directives. Criteria considering said objectives should hold greater weight in competition-based support schemes than the criteria considering the

ensuring of security of supply and economically most favourable solution;

- the importance of the assessment of the applicant's economic sustainability is relevant. However, it must not be forgotten that the request to provide information should not be too burdening for applicants and that the more detailed the applications the longer and more complicated the assessment process shall be.

Considering the fact that as of Nov 1st 2010 all district heating prices are set by the Competition Authority, this shall significantly improve the options for a more precise determination of the target group of a potential support measure according to the information collected in the course of price approval process.

80. NAO's recommendations to the Management Board of the Environmental Investment Centre: to ensure that the EIC financing decisions are justified

- draw up competence requirements for external assessors;
- only include external assessors who meet the requirements in the application assessment process;
- check that external assessors adhere to the assessment guidelines;
- check that application documents submitted by applicants adhere to the requirements established in the support measure regulation.

Reply from the Management Board of the Environmental Investment Centre: The NAO has referred to the failure to adhere to the assessment guidelines as well as to the competence of external assessors. We find that instead of including clear definitions of lists in the regulation and assessment guidelines the criteria could be more flexible (list may not take into consideration all relevant practical aspects related to the respective assessment criterion). Similar logic is addressed in the assessment criteria assessment report mentioned above. We are of the opinion that both assessors and experts should enjoy certain freedom of decision.

Likewise, the EIC cannot agree with the statement that employed assessors were not sufficiently competent. Although the competence of two assessors did not meet the requirements listed in the hiring advertisement, the recruiting process includes more than just compliance with the requirements in the advertisement. Assessment pairs were formed in the course of work and the pair assessing cogeneration plants was formed on the basis of the assessors' professional competence and need for preventing a conflict of interests.

By today the EIC has supplemented its internal procedures, adopted the rules of procedure for the assessment committee and, on the basis of the latter, has improved the management of the assessment process and supervision over the duties of assessment experts.

Heating supply may not be guaranteed for consumers at all times

81. Heating supplied to the population, its security and price depend largely on the technical aspects of district heating as well as on fuel. It is important for the state to reduce the use of imported and non-renewable fuels as this ensures our energy security and reduces our dependency on global crises. Due to the trend in the European Union and the rest of the world to reduce greenhouse gas emissions, renewable fuels are preferable in heat generation.

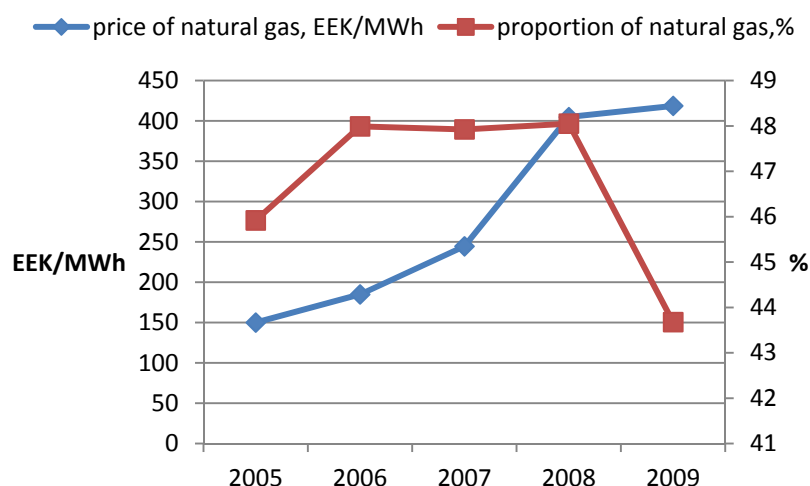
Estonia's heat supply is dependent on natural gas

82. From national viewpoint fuel supply in heating sector is reasonably ensured in terms of energy security when there are several fuel suppliers and no single fuel accounts for more than 30% of the balance of fuels in the generation of heat¹³. If a single fuel is used significantly more than others and its supply cannot be influenced nationally, it is important to create opportunities for the use of other fuels or for generating heat by other means.

Natural gas is the preferred fuel for heat generation

83. Estonia's heat supply depends largely on imported fuels, particularly natural gas. Irrespective of the increase in fuel prices, the share of natural gas in heat generation continued to increase up to 2008 (See Drawing 6), amounting to 48 % according to the data of Statistics Estonia. Increasing use of natural gas was the result of its affordability and low investments to start to use it. When in 2009 combined power and heat plants using wood and peat started to operate in Tallinn and Tartu, the use of natural gas decreased, amounting to 43.7 % in the year 2009 heat balance according to the data of Statistics Estonia. The share of natural gas will reduce even further due to the completion of a cogeneration plant in Pärnu in the near future.

Drawing 6. Change in the share of natural gas in heat generation compared to its price



Source: NAO's calculations based on the data of Statistics Estonia

¹³ "National Development Plan for the Heating Sector until 2020", approved in the Riigikogu in June 2009.

Did you know that ...

in Finland, natural gas is also the most used fuel in heat generation but its share is 32 %. In Sweden the share of natural gas in heat generation is less than 10 %

Users of natural gas depend on a single supplier

Natural gas is significantly more expensive than local fuels

84. If we only regard the share of fuels used for heat generation in boiler plants, the share of natural gas in 2009 was 53 %. Thus, when planning investments for improving the situation of heat supply, we must take into consideration the need for increasing the use of local and renewable fuels particularly in boiler plants.

85. In addition to the large share of natural gas in heat generation, the heat producers using natural gas depend solely on a single company – AS Eesti Gaas who imports natural gas from Russia. Apart from the three pipelines owned by Eesti Gaas, there are no other options for supplying Estonia with natural gas. As the gas network and supplier in Estonia have not been separated from each other, according to an exemption granted by the European Commission, generation of competition is complicated on the market. As the price of liquefied gas has dropped on the world market and Estonia is searching for options to build a terminal on its territory, a discussion on governmental level was initiated in the final stage of the audit, addressing the need for separating the gas supplier from the gas network.

86. Pursuant to the tripartite agreement between Eesti Gaas, Latvijas Gaze ja Gazprom, Estonia's natural gas reserve is stored in an underground container in Latvia. The Ministry of Economic Affairs and Communications is certain that if gas supply from Russia should cease, the gas supply should last for an entire winter. Problems may arise in March when the storage facility is almost empty. In winter, gas is supplied from the storage facility in Latvia to Estonia, Latvia and Lithuania. According to the Ministry of Economic Affairs and Communications a situation may arise in times of crisis where Latvia prefers to supply its own consumers before those in Estonia, which is why one of the options to ensure heating supply is to build a liquefied gas terminal in Estonia.

87. Compared to other fuels, natural gas has been so popular in Estonia due to the fact that investments needed for building natural gas boiler plants have been smaller than for building boiler plants using wood, for example. The surveys reveal that while the building costs of natural gas boiler plants start from EEK 1 million (EUR 63,914) per 1 MW¹⁴, the estimated costs of boiler plants using wood chips or peat are EEK 5 to 13 million (EUR 320,000 – 831,000) per each MW¹⁵ of power.

88. Another reason for preferring natural gas was that in order to penetrate the market Russia sold natural gas to Estonia cheaper than the world market price was. By now the price of natural gas has been increasing every year and in the last three or four years natural gas has been significantly more expensive than local fuels and this is evident in the price consumers pay for heat (see drawing 4).

¹⁴ "Mapping the development priorities of small Estonian heat producers and of the energy sector in rural areas", Estonian Heat and Power Association, 2009

¹⁵ "Expert assessment of the cost, technical solution and operational expenditure of boiler plants", commissioned by the Competition Authority and conducted by ÄF-Estivo AS in 2010.

Drawing 4. Examples of heat prices approved by the Competition Authority as at 27.8.2010

Heat producer	Main type of fuel used for heat generation	Price of heat EEK per MWh (EUR per MWh)
AS Kuressaare Soojus	wood chips	614,52 (39,27)
AS Võru Soojus	wood chips	680,2 (43,47)
AS Fortum Termest, Kostivere area	gas	821,4 (52,50)
AS Fortum Termest, Viiratsi area	gas	1080,22 (69,04)

Source: Website of the Competition Authority www.konkurentsiamet.ee

89. In recent years the share of renewable fuels has increased in the heat balance, this due to supporting of renewable energy and establishment of cogeneration plants, but in boiler plants the share of natural gas is still large. In 2005 to 2009 the state co-financed the transfer of eight boiler plants to renewable fuel¹⁶ through environmental support measures. The boiler plant in the City of Võhma was granted a support from the first round of the most recent and financially the largest renewable energy measure for the transfer to a renewable fuel. Likewise, the establishment of four cogeneration plants using biogas was supported. The NAO finds that, when drawing up the national development plan for the heating sector, analysis should be carried out of the directions in which to develop heat generation and which measures to use for reducing the share of natural gas in boiler plants.

90. NAO's recommendation to the Minister of Economic Affairs and Communications: To diversify the fuels used for heat generation and encourage the use of renewable energy, particularly in boiler plants, and reduce the share of natural gas, lay down measures and action plan in the national development plan for the heating sector for achieving said objectives. By 2020 the share of natural gas among fuels used for heat generation should not be more than 30 % in the heat balance.

Reply from the Minister of Economic Affairs and Communications: We agree with the recommendation. This objective has been laid down in the national development plan for the energy sector.

However, we would like to note that it is likely that to achieve this objective the share of renewable energy must exceed the threshold suggested in the development plan – share of renewable fuels (wood in the case of Estonia) in heat generation must be more than 30 %, most likely more than 40 %.

In case of emergency – accident at boiler plant, interruption of heat supply or bankruptcy of heating company – consumers may be left without heat

91. Risks of fuel supply interruptions can be managed if the heat producers possess sufficient reserves of primary fuel or an opportunity to use another fuel as a replacement. Likewise, the state must have an action plan for how to operate in case operational continuity ceases, which may lead to an **emergency**.

Emergency – in the context of this audit report an event or chain of events causing serious and extensive disturbances to the operational continuity of a vital service.

¹⁶ Boiler plants in Kolga, Tudulinna, Kuusalu, Otepää, Lihula, Pürksi and Elva.

Many local governments do not possess guidelines for operating in emergency

Did you know that ...

pursuant to the District Heating Act only large producers with an annual production capacity exceeding 500,000 MWh per network area are under obligation to possess fuel reserves. Such companies are Iru Elektriiaam, Narva Elektriiaamad and Tallinna Küte.

It is uncertain how many people may be left in cold if the heating supply should cease

92. Ministry of Economic Affairs and Communications is responsible for energy security. However, it is not the duty of this Ministry to ensure operational continuity of heating supply; this is the responsibility of local governments (LGs). It is the duty of the Ministry of Economic Affairs and Communications to ensure a continuous gas supply. Pursuant to the Emergency Act, both AS Eesti Gaas and local governments were to analyse the risks on gas and heating supply and develop an activity plan (operational continuity plan) by July 1st 2010, but this deadline was extended till Jan 1st 2011. AS Eesti Gaas has drawn up both the risk analysis of operational continuity and a plan for operating in emergency situation. According to the information received from the Ministry of Economic Affairs and Communications, the Baltic States are co-operating in the issues of energy security.

93. The audit revealed that in case of emergency some consumers of district heating may be left in cold as there are many local governments who currently have no plan of action if heating supply should cease. The LG Survey shows that in May 2010 34 local governments possessed and 117 lacked the relevant plan of action.

94. Furthermore, boiler plants often cannot use reserve or replacement fuels. The existence of a fuel reserve or replacement fuel allows the producer to continue supplying heat to consumers even if there are difficulties in supplying the primary fuel or other problems. It is important to note that the state has not requested the companies to have such reserves. District Heating Act stipulates the obligation of possessing fuel reserves only for three large companies whose reserves must cover the three days' consumption. The audit revealed that two of those three large heat producers could not certify the readiness to immediately switch to reserve fuel if necessary to the Competition Authority during the 2010 supervision. Later, one of them managed to certify its capability to switch to reserve fuel but unfortunately not within a reasonable time limit (2–3 hours) but after at least 24 hours. The problems with the other large company remain.

95. The LG Survey conducted by the NAO revealed that heat producers consider the existence of reserves or replacement fuels necessary in order to ensure continuity of heating supply. In spite of the absence of the legal requirements the heating companies in many local governments have kept primary fuel reserves and created an opportunity for using replacement fuels. According to local governments, primary fuel reserves existed in two thirds of their boiler plants (in 96 out of 151). In 55 local governments heat producers had no reserves, most of them were (73 %) using natural gas. An opportunity to use replacement fuels exists in 93 and is absent in 58 local governments, 16 of which use natural gas as primary fuel.

96. Although some local governments claim that their heat producers have a fuel reserve or an opportunity to use another fuel as a replacement in order to ensure security of supply, the state has no overview of this. Technical Surveillance Authority has information on operating boilers. However, there is no information on boilers kept in reserve for over eight years as it is not compulsory to carry out technical checks on such boilers and thus this information does not reach the Technical Surveillance Authority. Likewise, it is unknown whether the reserve boiler uses a

different type of fuel than the main boiler or uses the same fuel and is thus also useless if the supply should cease. Therefore, it is unknown how many suppliers may be directly affected in the case of emergency – e.g. if fuel supply should cease.

Interruption of heating supply may be caused by the bankruptcy of a heat producer

97. NAO's analysis revealed that heating supply can also be threatened by the bankruptcy of a heating company, in which case the continuity of the service is not provided for in the legislation. Issues of the transfer of the obligation of a company in the middle of bankruptcy proceedings and continuing the heating supply have not been regulated in the District Heating Act and Bankruptcy Act. District Heating Act lays down requirements for the termination of activities according to which the network company must notify the Competition Authority of its intention to terminate activities one year in advance, and prior to termination must transfer its obligations to another company. The NAO is of the opinion that in case of difficulties it is impossible to adhere to the advance notification requirement and continue the provision of service while generating loss. In the course of the audit the bankruptcy proceedings of an owner of a heating company were under way. That company provides the district heating service in several local governments.

The state underestimates the risk of the interruption of heating supply

98. The NAO finds that the reason behind the problems mentioned above is the fact that the state has failed to acknowledge the risks of heating supply interruption and has not analysed how to ensure a warm room and water to the population in the case of heating supply interruption, accident in the boiler plant or bankruptcy of the heating company. Although the Emergency Act stipulates that local governments are responsible for ensuring the operational continuity of heating supply, the NAO finds that local governments do not acknowledge their role, especially in areas where heat network has been privatised and district heating prices are approved by the Competition Authority. Survey revealed that local governments are expecting the heat producer or state to find solutions to problems.

99. Furthermore, keeping reserve or replacement fuels is costly for a company thus making heat more expensive for the consumer. According to the Ministry of Economic Affairs and Communications the reason why the District Heating Act stipulates that only large companies are required to keep reserves is that if large companies stop using natural gas in case of interruption of supply and transfer to a replacement fuel, gas pipelines hold enough fuel for smaller producers to last throughout the entire winter.

100. The NAO is of the opinion that in the case of the interruption of natural gas supply it is likely that the state cannot cope with the emergency if large producers cannot switch to replacement fuels and that means that there will be no gas left for smaller producers. As many heating companies only use natural gas, most of the population using district heating may be left without heat. In this case, electric heating, as the quickest solution, will be used to heat buildings and this in turn may cause a risk of power failure due to overload.

101. Consumers' heating supply is also at risk in the case of bankruptcy of the heating company. If the bankruptcy concerns a private company, neither the state nor the local government can interfere in the process. The trustee in the bankruptcy process can continue the generation and

distribution of heating supply but the trustee must only act in the interests of obligees. Provision of a vital service is not the duty of the trustee.

102. NAO's recommendations to the Minister of Economic Affairs and Communications:

- To ensure continuous operation of boiler plants in the case of the interruption of fuel supply, analyse whether current requirement to store reserve fuel only if the company's annual production capacity exceeds 500,000 MW/h is sufficient. If necessary, request that smaller companies, in particular boiler plants using gas, also find an opportunity to make use of reserve or alternative fuels.
- To ensure heating supply to consumers in the case of bankruptcy of the heating company, make relevant amendments to the legislation.

Reply from the Minister of Economic Affairs and Communications:

In general, we agree with the recommendations. When it comes to smaller heating companies the requirement for reserve fuel may not be purposeful as in rural areas the price of district heating is high enough as it is and as the above mentioned requirement shall lead to a price increase, district heating shall lose its competitiveness.

103. NAO's recommendation to the Minister of Internal Affairs: To ensure that local governments possess knowledge of how to draw up an operational continuity plan for heating supply, explain the need for this plan, co-ordinate the development of plans and later check whether the plans have been completed and are relevant.

Reply from the Minister of Internal Affairs: The Ministry of Internal Affairs accepts the recommendation and notes that experts from the Ministry of Economic Affairs and Communications should definitely be included in this. Pursuant to the current Emergency Act, the Ministry of Internal Affairs, Rescue Board and regional rescue centres can provide counselling to local governments when it comes to the risk analysis of the operational continuity of district heating system and network as a vital service and development of plans. The same Act requires larger providers of a vital service to carry out relevant analyses (Emergency Act, § 37 (3)). Activity licences for heating supply are issued and prices are set by the Competition Authority. Local governments in their comprehensive plan determine the areas of district heating and the decision of the council establishes the terms and conditions for the provision of service. Relevant advice can also be given by the experts in the Competition Authority; the Ministry of Internal Affairs does not have relevant experts. Through the Rescue Board's rescue centres the Ministry of Internal Affairs can explain to the local governments the necessity of developing a heating supply plan. However, the Ministry of Internal Affairs cannot guarantee for certain that local governments have completed such plans (referred to in the recommendation "... later check whether the plans have been completed and are relevant") and the relevancy of plans must also be assessed by the Competition Authority.

104. NAO's recommendation to the Director General of the Competition Authority: Carry out regular supervision over whether companies whose annual production capacity exceeds 500,000 MW/h can

make use of reserve or replacement fuel. If necessary, implement coercive measures prescribed by law.

Reply from the Director General of the Competition Authority:
Competition Authority agrees with the recommendations. Competition Authority has carried out such supervision and shall continue to do so.

Approval of the price of heat and supervision over the field have not ensured equal treatment of heat consumers

105. To ensure that the price of heat for all consumers would contain similar expenses, the regulation of heat price must be carried out according to common principles for all heat producers. Price approval must also ensure that service of similar quality provided to all consumers. Regulated price of heat must not be higher than alternative means of heating and must allow the maintenance of district heating equipment and pipelines so as to ensure future heating supply to consumers. Supervision over companies must ensure compliance with the District Heating Act and give consumers a sense of security in knowing that the price of heat is controlled and cost-oriented.

Rules for the approval of the price of heat are not clear

106. Approval of the price of heat must be independent and give consumers a sense of security in knowing that the price they pay for heat is fair. Approval must take as little time as possible and comply with the following requirements:

- price approval shall be carried out according to common principles that are known to relevant parties;
- price approval process and used methods shall not be changed without justifying the need for amendments to relevant parties;
- used methods are sufficiently accurate and unambiguous¹⁷.

107. The audit revealed that each price regulator (i.e. Competition Authority and local governments on whose territory district heating is used) have carried out price approval according to their own knowledge. There are no common methods for the approval of the price of heat to be used by all approvers of price. The District Heating Act establishes the general principles to be taken into account upon the approval of the price of heat (see Clause 15) but the Act does not provide a detailed description of the price approval process or prescribe the need to establish common methods for all regulators. The law stipulates that every local government may establish its own method for the approval of price but such right has not been granted to the Competition Authority. However, the Competition Authority has developed its own methods.

108. The development of price approval principles by Competition Authority is based on the Electricity Market Act which grants the

Price regulators have not adhered to common principles

¹⁷ Tariff setting guidelines, World Bank, PPIAF.

Authority the right to develop principles for the approval of electricity prices. The NAO is of the opinion that the document of approval principles, established proceeding from the analogy of another Act, does not have the same legal effect as the Regulation of the Minister. It means that the Competition Authority's methods are regarded as internal rules and its criteria (e.g. requirements for the heat loss of heat network or the scale of the boiler's efficiency) are not legally binding for the company. These criteria become compulsory for the company when the Competition Authority has adopted a price approval decision on their basis. Head of the Competition Authority had not approved the price approval principles until October 2008. According to the explanation by the Ministry of Economic Affairs and Communications they did not wish to approve the price approval methods on the Minister level until a good practice for price approval has been developed.

Competition Authority has continuously changed the price approval principles

109. Competition Authority has published the price approval principles used in its area of administration on its website but has already changed them for several times (see Table 5). Competition Authority claims that these are minor changes arising from the need to supplement methods due to developments on the heat market.

Table 5. Methods of the Competition Authority and times they were changed

Name of method	Year of Publication
Principles for the approval of the price of heat	2003
Principles for the approval of the price of heat	2006
Principles for the approval of the price of heat	2008
Guidelines for the approval of thermal energy maximum price on the basis of a formula, and for the calculation of correction	2008
Principles for the approval of the price of heat	Until 30.6.2009
Principles for the approval of the price of heat	Since 1.7.2009

Source: Competition Authority.

Methods used for price approval are not sufficiently accurate or clear

110. It was also revealed that in spite of several supplementations to the price approval principles, this document fails to determine clearly how and on which conditions said methods are to be implemented. Analysis of documents of the companies included in the sample showed that the Competition Authority has not been consistent in its use of methods and has wished to change the used method even during the same single price approval process.

111. Absence of implementing guidelines means that the price approval process is not transparent, decisions are substantially different and largely dependent on the skills of the official responsible for price approval. Upon examining price approval documents the NAO found several examples of the obscurity of the process:

- One of the methods used in price approval is the calculation, by comparing companies, of the companies' average expenditure, average heat loss in heat network, the boiler's efficiency, fuel price or the average of other indicators. Received average figures are used for assessing the effectiveness of the company which price is approved at that time. When the method of comparison is used the decisions do not indicate which companies were compared. There is only a

reference that the companies are similar, without explaining which companies were used for the comparison and the technology they use, incl. fuel and their production capacity, or which period the data refers to. Therefore, heat producer cannot know which companies its data was compared to and is unable to check the accuracy of the analysis. However, the average figure obtained as a result of this comparison is important for the companies as the Competition Authority has requested at price approval that this be taken into consideration in the price. If actual expenses are larger or effectiveness lower, the companies must find ways to save or cover additional expenses from the profit. In the course of every price approval new average levels are calculated for expenditure, heat loss of the network, boiler's efficiency or other indicator, and these may be significantly different from the average implemented during the previous price proceeding as companies with different expenditure levels are taken into account each time. Example 2 gives the average operational costs calculated for different years during a company's single price approval process.

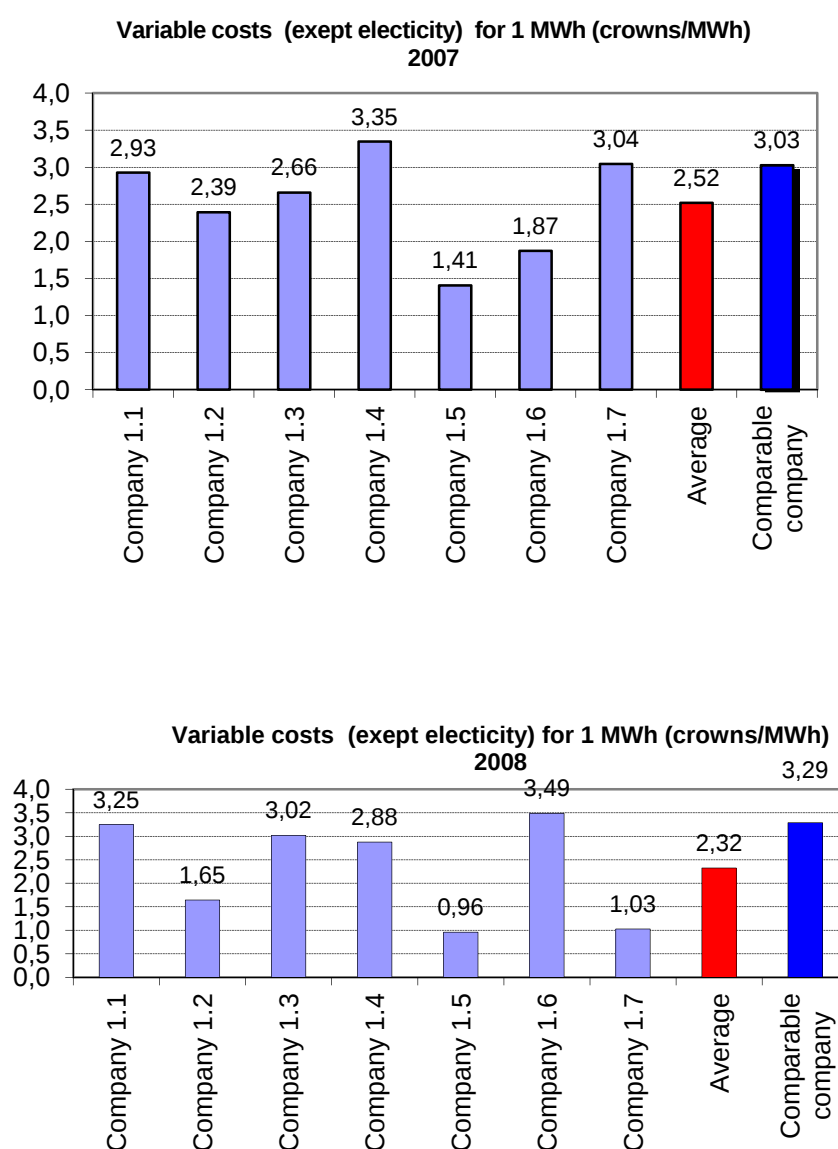
- It is mentioned regarding the companies' comparison method that the comparison uses the companies' average level of expenses. However, this figure is not based on the companies' actual average expenses but is the average of expenses regarded as justified by the Competition Authority, as the comparison takes into account indicators previously accepted by the Authority. Thus the decision does not include a specific reference to the expenditure level the companies' data was compared to. According to the Competition Authority it is not possible to consider the companies' actual expenses as this would lead to the unreasonable increase in the companies' expenses and price of heat and there would be no point in price regulation.
- Competition Authority employees use different principles for assessing the justification for the fuel price submitted by the heat producer. For instance, fuel prices of certain companies were compared to the prices obtained from fuel suppliers, some were compared to the companies' average prices and for some the data from Statistics Estonia was used.
- Expert assessments used during price approval were not available for companies. For example, the Competition Authority has commissioned expert assessments of the calculation of capital expenditure and the cost of boiler plants, technical solution and operational expenditure, and referred to these assessments in its price approval decisions but has not published the assessments on its website. The NAO notes that the Public Information Act¹⁸ stipulates that commissioned surveys and analyses must be published by the public sector. While the expert assessment of the calculation of capital expenditure was deemed confidential by the compiler of the assessment, no such reference was found in the assessment of the cost of boiler plants, technical solutions and operational expenditure. Neither did the compiler of the latter say that expert assessment should be confidential, as it did not contain data related to the companies' business secrets. The NAO finds that expert work used

¹⁸ Public Information Act, § 28 (1) (18).

for the regulation of prices of many companies must maintain such a level of generalisation that it could be made public. This helps to ensure transparency of price approval process.

- The Competition Authority has mentioned in its price approval decisions that meetings with representatives of companies took place in the course of price approval process but there were no documentation as to the agreements reached at these meetings. The companies' on-the-spot inspections have not been documented either.

Example 2. Comparison tables of companies' expenditure used by the Competition Authority for the comparison of the expenditure of a single company to the average in 2007 and 2008¹⁹



112. Examination of applications for price approval submitted by the companies revealed that at the beginning of the approval process the

¹⁹ Drawings are taken from the Competition Authority's price approval documents, the NAO has removed the name of the compared company.

Competition Authority did not require the companies to submit all information necessary for price approval. Companies were only asked to fill in figures in a form and did not have to submit descriptions or justifications for expenses and investments. However, this information is always relevant and the Competition Authority requested it during the price approval process later via e-mail.

113. Continuous requesting of additional information via e-mail makes the price approval process time-consuming and labour-intensive for both the Competition Authority and companies. Although the District Heating Act stipulates that price approval may take up to 30 days and that the proceeding of especially complicated and labour-intensive approval application may be extended to 60 days, the average length of the price approval process of companies included in the sample was 67.6 days²⁰. Pursuant to the District Heating Act the term for processing an application for approval of prices shall be suspended if the Competition Authority has not received all the required information necessary for approval of prices. As the documents did not always make it clear when the term for processing had been extended to 60 days and when the term was suspended, the NAO deemed the time spent on proceedings as the length of proceedings. Amendment to the District Heating Act proceeding from the act establishing price limits for monopolies, entering into force on Nov 1st 2010, extends the term of a particularly complicated proceeding to 90 days. In the case of an extended price approval process the producer has to incur increased expenses, e.g. because of the increase in the price of electricity and fuel, not included in the current price. These cannot be recorded later in the price of heat because there is no retroactive netting of costs and benefits. According to the explanation of the Competition Authority the reason behind long approval processes is the fact that some companies keep changing submitted data, submit conflicting explanations and edit applications.

Competition Authority has failed to check the companies' source accounting documents

114. Although the price approval process is very long the Competition Authority has failed to assess, in the scope of the sample analysed by the NAO, the companies' expenses on the basis of accounting documents, in spite of the fact that according to the explanation provided by the Competition Authority some companies purposefully submit inaccurate data upon price approval. Pursuant to the District Heating Act, the Competition Authority is responsible for checking the documents.

115. Poor transparency and use of different methods upon price approval is due to the fact that the Competition Authority has failed to develop implementation guidelines for the principles of price approval, rules of procedure and internal system for ensuring the quality of price approval process. The Competition Authority is of the opinion that an even quality is ensured by the head of department or his/her deputy and the Director General reading through all the price decisions.

116. The NAO finds that the rules implemented for a price regulation are not the same for all companies, which is why equal treatment of companies and consumers is not ensured. For consumers, price formation on the basis of different rules means a different price and uneven quality

²⁰ Minimum of 21 days and maximum of 151 days.

of service. In its analysis ²¹ the World Bank considers continuous changing of price approval rules and the use of different methods that are incorrectly implemented to be one of the main impediments in making investments. Examination of the decision of the Supreme Court relating to price approval showed that the main issues of dispute include price approval principles and their implementation. According to the officials of the Competition Authority and representatives of companies disputes are currently being processed that had not been resolved at the time of the NAO audit.

117. NAO's recommendations to the Minister of Economic Affairs and Communications:

- Initiate an amendment of the District Heating Act to authorise the Minister of Economic Affairs and Communications to establish price approval principles by a legislative act.
- To ensure equal treatment of heat consumers and producers, collaborate with the Competition Authority and develop common principles for the approval of the price of heat and implement these with legislation. Principles for the approval of the price of heat must include the objective of approval, description of used methods and terms and conditions for their implementation.

Reply from the Minister of Economic Affairs and Communications: We agree with the recommendations in part. When it comes to the development of common principles for the approval of the price of heat the Ministry of Economic Affairs and Communication is of the opinion that development of new principles for the approval of the price of heat is not necessary as principles already exist and have been used for years. However, we do think it is necessary to supplement current principles for the approval of the price of heat in co-operation with the Competition Authority.

Development of the national development plan for the heating sector shall consider the need for specifying the bases for the formation of heat price in legislation.

Opinion of the Director General of the Competition Authority: This is a legal/philosophical issue addressing the scope the regulation should be described in legislation. Here, the Competition Authority suggests that bases for price formation be specified with the amendment to the District Heating Act. NAO's recommendation favours the formation of a so-called political heat price. All in all, this could become an unreasonable burden for both consumers and heating companies. This happens particularly if principles for the heat price approval are changed by simple means with a regulation within short periods of time.

The Competition Authority finds that the development of new principles for the approval of the price of heat (methods) is not necessary as such principles already exist. The Competition Authority agrees to include in the current principles a more detailed description of used methods and terms and conditions for their implementation.

²¹ Tariff setting guidelines, World Bank, PPIAF.

118. NAO's recommendations to the Director General of the Competition Authority:

To ensure transparency of price approval process, equal treatment of companies and shorten the term of proceedings, carry out the following activities:

- Develop implementation guidelines for price approval principles, procedure for their amendment as well as guidelines for ensuring quality of proceedings and decisions. Approve said documents with the directive of the Director General and publish them on the website.
- Request the companies to submit all data and documents needed for heating price approval at the start of proceedings.
- Immediately disclose the expert assessments used for price approval that are referred to in the course of proceedings if they do not contain confidential information. If the results of expert assessment are used for the approval of prices of several companies, the original task of the assessment must be determined so that the results would not include confidential information.
- If it is necessary to change the price approval principles, employ experts to assess the impact of changes.
- When specific methods are used (e.g. upon mutual comparison of companies) observe that methods would be clear to all companies, that the compared companies are similar in terms of technical indicators and used fuels, and that compared expenditure is from the same period. When calculating averages avoid distortion which means that justified average figure must not be overestimated or underestimated.
- When checking the same expenditure components continuously implement the same methods for all companies.
- Document all activities of price approval and supervision (company's on-the-spot inspection, comparison of annual accounts, meetings with companies in the course of price proceedings).

Reply from the Director General of the Competition Authority:

- The Competition Authority agrees to supplement the principles for the approval of the price of heat (methods). Current principles will be supplemented with more detailed description of used methods and the terms and conditions for their implementation. When it comes to proceedings the Competition Authority shall proceed from the requirements laid down in the Administrative Procedure Act and by specific law.
- The Competition Authority has supplemented the tables of price approval (questionnaire) pursuant to the District Heating Act and has significantly supplemented the list of data submitted for price approval in 2010.
- Relevant assessment will be disclosed to the company for whose price approval expert assessments were used but the Competition Authority cannot disclose confidential information. In the future, when determining tasks for expert assessments, the Competition Authority will try to consider the NAO's recommendation and

determine the task so that the results would not contain confidential information.

- First and foremost, the Competition Authority uses its own qualified employees who are undoubtedly experts in their respective fields. The Competition Authority employs a sufficient number of people with relevant professional training (incl. heating supply), incl. employees with an academic degree. If necessary, we have included and shall continue to include independent experts.
- The Competition Authority has already adhered to said recommendations when drawing up a comparative database and databases have been drawn up on the basis of the abovementioned principles. The Competition Authority shall continue to adhere to said principles.
- In the price approval process the Competition Authority has a right of discretion for the assessment of different expenses and this is implemented upon the assessment of expenditure components included in the price of heat. These principles have been used for the past 10 years and we shall continue to use them.
- The Competition Authority shall take into consideration the NAO's recommendations regarding the documentation of activities.

Local governments were not capable of regulating the price of district heating

119. Upon the approval of the price of heat local governments had to take into consideration the expenditure components prescribed in the District Heating Act (see Clause 15).

120. The audit revealed that in the local governments included in the sample the practice of price approval has been very different and in many cases the justification of expenses submitted by the company had not been analysed. It was not clear from the approval decisions which expenses had been included in the price of heat and whether the expenses had been checked. Due to the absence of common approval principles the documents submitted to local governments as applications for price approval included a different amount of details. The NAO analysed 37 price approval processes in 10 local governments included in the sample where prices were approved by the local government. Below are examples of the price approval documents of local governments included in the sample.

- In 16 cases there were no applications from companies for price approval.
- There were no calculations in five applications submitted by companies.
- One rural municipality had accepted a price approval application indicating only the final price and giving the proportion of expenses in per cents.
- None of the audited local governments had requested the companies to submit expense receipts for price approval.

Local governments have not analysed the companies' expenses in the course of price approval process

121. NAO also found that local governments had not ensured the equal treatment of consumers. The LG Survey revealed that there were areas where the price of heat was not the same for all consumers. For instance, differentiation was made between private and corporate clients and local government authorities. The LG Survey and analysis of sample documents showed that in eight local governments the price of heat was lower for private consumers²² and higher in one local government²³.

Local governments have set different prices for consumers in the same area

Price of heat in Scandinavia in 2009

Finland: 524 – 1496 EEK/ MWh (33.49–95.61 EUR/MWh)

Sweden: 548 – 1208 EEK/ MWh (35.02–77.21 EUR/MWh)

Denmark: 333 – 2942 EEK/ MWh (21.28–188.03 EUR/MWh)

Above prices do not include VAT.

122. Local governments' price proceedings were uneven as the District Heating Act does not determine what contents should the price regulation principles established by local governments include, and there was no national level example for it. This led to a situation where local governments referred in their price guidelines only to the provisions of the District Heating Act and had not established further guidelines for price regulation. Another reason for price approval processes being problematic in local governments was that they did not often possess the skills for carrying out a substantial assessment of the production cost of heat and investments and thus also for price approval.

123. The NAO feels that if consumers are sold heat at uncontrolled price, it may mean that consumers also have to pay for the company's expenses that are not related to the generation of heat.

124. District heating prices differ very much across Estonia, being from EEK 430 (Narva Soojusvõrk, district heating uses residue heat from power generation in Narva Elektriijaamad) to EEK 1470 (Nõo Rural Municipality, generates heat from shale oil) (EUR 27.48–93.95 per MWh). Price differences are largely dependent on the fuel used, but the age of the region's equipment and heat networks, maintenance of equipment, general maintenance costs, made investments and the fact which expenses have been taken into consideration in the price, are also relevant here.

Did you know that ...

the most expensive district heating has been approved by local governments in the following distant heating areas:

- Märja – EEK 1434 (EUR 91.65) per MWh
- Palamuse – EEK 1427 (EUR 91.2) per MWh
- Tabasalu – EEK 1375 (EUR 87.88) per MWh
- Lehmja – EEK 1323 (EUR 84.56) per MWh

Source: Competition Authority

125. Pursuant to the amendment to the District Heating Act, entered into force on Nov 1st 2010, local governments were relieved from the price regulation obligation and the Competition Authority undertook the price regulation for all producers. The NAO is of the opinion that this shall make supervision over heat producers and price approval activities more even. However, without specific implementation guidelines for price approval principles it is difficult for the Competition Authority to ensure an effective and functioning price approval process. One must not forget that even though checking the expenditure of smaller companies is easier, the work load of the Competition Authority is multiplied by the added price regulation activities for water and sewerage services. However, this must not contribute to lengthening proceedings even more; the Competition Authority has problems with this already.

Supervision over heat producers is ineffective

126. The Competition Authority was supposed to carry out supervision over compliance with the requirements of the District Heating Act among

²² The price of heat is lower for private consumers in the following regions: City of Elva, Rural Municipalities of Valgjärve, Ridala, Oru, Noarootsi, Mustvee, Luunja and Järvakandi.

²³ The higher price was established in the Muhu parish.

heat producers with annual production capacity of more than 50,000 MW/ h and local governments were supposed to carry out supervision over the rest of heat producers. Supervision must include confirming the compliance of the company's activities with the requirements of the District Heating Act: e.g. the existence of reserve fuels, justification for the expenses included in the price of heat.

127. The audit revealed that systematic and planned supervision over companies was not carried out. Information on companies was mostly obtained when the companies came to approve the price of heat. Even though the Competition Authority claimed that it has carried out random on-the-spot inspections in companies, it had failed to complete supervision reports for them. Thus it was not possible for the NAO to assess the activities of the Competition Authority in carrying out supervision. The Competition Authority initiated the first documented supervision proceedings at the time of the NAO audit for the options to use reserve fuels in 2010 and the cost-oriented price of the cogeneration plant.

128. Likewise, it became clear that neither local governments nor the Competition Authority have managed to ensure that all companies sell heat at a price based on justified expenses. In the course of the audit the NAO identified that in 11 areas where price approval is carried out by the Competition Authority, heat is sold at a price approved on the basis of an expired **price formula**. Furthermore, in one area the Competition Authority has approved the price repeatedly on the basis of an invalid price formula. Law does not provide measures for forcing companies to approve a new price formula or maximum price. The Competition Authority claims that established maximum price does not expire. The NAO is of the opinion that in this situation cost-oriented price is not ensured for consumers.

129. As supervision has so far been fragmented, just like price approval, it has led to the diffusion of responsibilities. There are two companies, operating in many district heating areas in Estonia (one operates in 21 areas with 41 boiler plants and the other in ca 100 boiler plants) whose price of heat should be approved by the Competition Authority but who continue to sell heat at prices approved in local governments. The NAO came to this conclusion after dividing the sales volumes given in the companies' annual declarations by the highest known selling price of heat in Estonia and getting a result that exceeds the limit of 50,000 MW/h per year. The Competition Authority is addressing this issue but the situation has changed since the Nov 1st as the approval of prices of all companies became the responsibility of the Competition Authority.

130. The LG Survey also showed that in two areas belonging to the area of responsibility of local governments heat is sold at an unapproved price (Helme and Audru Rural Municipality). Sale of heat at an unapproved price violates the District Heating Act and the penalty for such activity is a fine of up to EEK 50,000 (EUR 3196). With the act establishing price limits for monopolies, entering into force on Nov 1st, the size of the fine has been raised to EEK 500,000 (EUR 31,956).

131. Problems with supervision are caused by poor cooperation between local governments and the Competition Authority. Supervision is only carried out over companies who have applied for price approval. The District Heating Act also fails to determine how the identification of

The price of heat of all producers has not been approved

Price formula considers all components relevant to price formation, e.g. price of fuels, company's management costs, depreciation of production equipment, need for investments, environmental fees, etc. Price formula is established for the period of three years during which the price is only adjusted if the price of fuel changes.

exceeding of the 50,000 MW/h sales limit should be carried out. Thus, theoretically, either the company itself or the local government on whose territory the company operates, should have notified the Competition Authority of the exceeded sales limit. However, the local governments do not have an overview of the sales volume of the entire company; in the best case scenario they only possess the information on the heat production and sales volumes and expenditure of the unit operating on their administrative territory. Companies were not interested in being governed by the Competition Authority as it was a known fact that price approval had been much easier in local governments.

132. The NAO is of the opinion that due to poor supervisory activities it has not been possible to ensure that all producers sell heat at a justified and approved price. As local governments were not able to check how the expenses of companies operating in several local governments were divided between regions, the District Heating Act valid until Nov 1st 2010 failed to ensure price approval on common grounds. Lack of co-operation between the Competition Authority and local governments had led to a situation where several companies violated the District Heating Act up till now and have failed to approve the price of heat or have done it by means most convenient for them. As a result of amendments to the District Heating Act, entered into force on Nov 1st 2010, supervision over all heat producers shall be carried out by the Competition Authority. This, however, means that in the future local governments will not receive information from companies on the generation of heat and condition of heat networks, and they may find that planning their actions in case of emergency are complicated. To obtain information the local government must contact either the company or the Competition Authority.

133. NAO's recommendations to the Director General of the Competition Authority:

- To ensure that the companies have submitted accurate information for their activities in the course of price approval and supervision, examine the source accounting documents if necessary.
- To ensure compliance with the District Heating Act, develop principles and procedure for supervisory activities and carry out regular supervision over companies.

Reply from the Director General of the Competition Authority: The Competition Authority has checked the source accounting documents upon price approval, if necessary, and shall continue to do so.

As pursuant to §28, §29 and §30 of the District Heating Act the Competition Authority has carried out and shall continue to carry out supervision over companies, the Competition Authority agrees to develop the procedure for supervisory activities.

/Signed digitally/

Tarmo Olgo
Audit Director, Performance Audit Department

Characterization of audit

Objective of audit

The objective of the audit was to assess whether the state has organised the activities in the heating supply sector (first and foremost district heating) so as to ensure secure, reliable, effective and justified heating supply with spread risks and conforming to environmental requirements and the needs of consumers.

Assessment criteria

Upon giving its assessment the National Audit Office proceeded from the following criteria:

- For consumers, compared to local heating equipment providing convenient heating (e.g. electric heating, heat pumps or other central solutions), district heating is comparable due to its price, convenience and effectiveness.
- District heating is only used in areas with a sufficient amount of consumers and district heating systems are built in a way that heat can be produced and distributed to consumers without unjustified expenses and loss.
- If necessary, support measures have been developed for investments into the maintenance of infrastructure and said measures take into consideration the objectives of national and local government development plans. Allocation of financial support is justified, transparent and equal to all market participants.
- The share of an individual fuel on the heat balance shall not exceed 30 %, otherwise measures developed by the state for diversifying the energy balance shall be implemented. Security of heating supply shall be ensured for consumers at all times.
- Heat price approval process is transparent, treats producers and consumers equally and provides consumers with a feeling of security that a justified price is being paid for heating. Motivation to make investments has been ensured for heat producers. Monitoring on a monopolistic market ensures compliance with the requirements of the District Heating Act.

Scope and method of audit

The audit analysed the activities of the Ministry of the Economic Affairs and Communications in regulating the field of monopolistic district heating, identifying the need for investments and support and organising price formation and monitoring.

The audit also analysed the activities of the Competition Authority and local governments belonging to the sample in approving the price of district heating and organising monitoring, as well as the activities of the Environmental Investment Centre of the Ministry of Finance in assessing applications for support measures and adopting financing decisions.

The audit focused on the period of 2005-to-2009

An expert sample of district heating network areas was drawn up for analyses. The sample was formed following the principle that it would include representatives of network areas in the scope of regulation of the Competition Authority and local governments with different forms of ownership and using different types of fuel.

Networks of the following local governments were included in the sample: Cities of Elva, Kuressaare, Rakvere, Tallinna, Tartu and Võru, and Rural Municipalities of Jõelähtme, Lihula, Muhu, Mäetaguse, Märjamaa, Orissaare, Räpina, Türi, Vara and Viiratsi.

The audit focused on the following main issues:

- Has the legal framework ensured sustainable development of district heating and energy security?
- Does the heat price formation ensure competitiveness, sustainability and security of energy supply, incl. energy security?
- Does the state possess an action plan for the development of heat supply?

The following activities were carried out in order to answer the main questions of the audit:

- Analysis of the legislation of Estonia and European Union, documents related to the planning of energy sector of local governments included in the sample, incl. development plans for the energy and heat sector.
- An online survey including all local governments to gather information on the condition of district heating, local governments' role in ensuring heating supply, need for investments, existence of fuel reserves, etc. All 226 local governments responded to the survey.
- Analysis of developments in the field of district heating on the basis of the heat balance of Statistics Estonia, share of fuels and price database.
- Analysis of results of surveys addressing the issues of heating conducted in the field of district heating by the Estonian Heat and Power Association (EPHA), Ministry of Economic Affairs and Communications, Competition Authority and local governments.
- Comparison of data on heat loss in heat networks obtained from the Competition Authority and the LG Survey.
- Comparison of district heating prices in sample areas and Nordic Countries (Finland, Sweden, Denmark and Norway). Comparison of district heating prices and prices for alternative electric heating as well as dependency of prices on changes in fuel price.
- Analysis of the development of terms and conditions for the EIC measure "More widespread use of renewable energy sources for the production of energy" as well as assessment of applications.
- Analysis of documents of companies included in the sample relating to the approval of the price of heat in the Competition Authority and local governments.
 - Analysis of local governments' price approval activities on the basis of the decision to approve the 37 prices of the 10 local governments included in the sample.
 - Analysis of the Competition Authority's price approval activities on the basis of the decision to approve the 82 prices of the 8 district heating areas on the territory of 6 local governments as well as on the basis of other relevant documents. Price approval decisions were adopted in the period of 2005 to 2009.
- Interviews were conducted with and explanations requested from the following persons:
 - Ministry of Economic Affairs and Communications:
 - Einari Kisel, Deputy Secretary General (Energy)
 - Lauri Tammiste, Director of Energy Department

- o Sigrid Vesiallik, Head of Energy Market Division
- o Helja Kulderknu, Executive Officer in Energy Market Division

Competition Authority:

- o Külli Haab, Head of Railways and Energy Department, Deputy Director
- o Mare Karotamm, Deputy Head of Railways and Energy Department
- o Klarika Siegel-Lorvi, Chief Specialist in the Railways and Energy Department

Technical Surveillance Authority:

- o Kaur Kajak, Deputy Director General
- o Kaimar Eilo, Head of Technical Safety Department

Ministry of the Environment:

- o Viktor Grigorjev, Adviser in the Environmental Management and Technology Department
- o Kai Willadsen, Chief Specialist in the Supervision Bureau of the Foreign Financing Department

Environmental Investment Centre of the Ministry of Finance:

- o Hannes Aarma, Deputy Head of Structural Funds Unit
- o Ulvi Tuisk, Programme Specialist
- o Siim Umbleja, Project Coordinator
- o Jaanika Lilienberg, Project Coordinator

Persons relevant to the field:

- o Ülo Kask, Tallinn University of Technology, Department of Thermal Engineering, Research Scientist
- o Eimar Jõgisu, ÄF-Estivo AS, Senior Consultant
- o Teet Eelme, Member of the Management Board of the Estonian Heat and Power Association, Head of Gas Department of Fortum Termest AS
- o Vladimir Panov, Head of AS Tallinna Soojus

Time of completion of audit:

Audit activities were carried out from September 2009 to June 2010.

Audit team:

The audit team consisted of Kaire Kuldpere (Audit Manager), Margit Jaksen (Auditor) and Jaanus Saadve (Auditor).

Contact information

Additional information on the audit is available from the Communication Service of the National Audit Office

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An electronic copy (pdf) of the audit report is available on the NAO's website www.riigikontroll.ee.

Summary of the audit report is also available in English.

The audit report has been registered in the documentation system of the National Audit Office under No. 2-1.7/11/70004/58.

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