

ENERGY MARKET INSPECTORATE

**ESTONIAN ELECTRICITY AND GAS
MARKET**

REPORT

TALLINN 2007

Contents

1. FOREWORD	4
2. ENERGY MARKET REGULATORY AUTHORITY REVIEW	6
3. ELECTRICITY MARKET	11
3.1. Review of electricity market	11
3.1.1 Cross-border power connections, availability of power reserve and its distribution	15
3.1.2 Estlink	16
3.2 Regulation of electricity networks.....	17
3.2.1 Subsidising of renewable sources and cogeneration.....	26
3.2.2 Regulation period 2005 to 2008.....	27
3.2.3 Quality of electricity supply.....	28
3.2.3.1 Customer service quality requirements.....	28
3.2.3.2 Network services quality requirements.....	30
3.2.4 Balance responsibility.....	32
3.2.5 Unbundling of activities.....	33
3.2.6 Ensuring of equal treatment.....	35
3.2.7 Equal treatment action plan	37
3.2.7.1 Unbundling of activities in the transmission network	37
3.2.7.2 Management of the transmission network operator.....	38
3.2.7.3 Equal treatment of market participants.....	39
3.2.7.4 Buying goods and services from enterprises of Eesti Energia AS group	41
3.2.7.5 Public relations.....	42
3.3 Competition in electricity market.....	42
3.3.1 Wholesale market.....	42
3.3.2 Retail market.....	44
3.3.3 Selling obligation and price regulation	45
3.4 Competition supervision.....	48
3.5 Obligations of market participants and customer protection	50
3.5.1 General obligations of market participants	50
3.5.2 Rights and obligations of the Inspectorate.....	52
3.5.3 Customer information	53
3.5.4 Customer contracts, supply limitations and interruptions, extra-judicial proceedings	53
4. GAS MARKET.....	56
4.1 Review of gas market and its regulation.....	56
4.1.1 Cross-border connections, availability and distribution of capacity reserves.....	61

4.1.2	Price regulation of gas networks.....	62
4.1.3	Quality of gas supply	67
4.1.4	Balance responsibility.....	67
4.1.5	Unbundling of activities.....	68
4.2	Competition in gas market.....	72
4.2.1	Wholesale market.....	72
4.2.2	Retail market.....	74
4.2.3	Selling obligation and price regulation	75
4.3	Competition supervision.....	76
4.4	Obligations of market participants and customer protection	78
4.4.1	General obligations of market participants	78
4.4.2	Rights and obligations of the Inspectorate.....	80
4.4.3	Customer information	81
4.4.4	Customer contracts, suspension and limitation of gas supply and extra-judicial proceedings	81
5.	SECURITY OF SUPPLY	83
5.1	Electricity.....	83
5.1.1	Estlink and other connections	87
5.1.2	Lithuanian nuclear power plant	87
5.2	Natural gas.....	88
6.	REVIEW OF DISTRICT HEATING SECTOR	94

1. Foreword

Similarly to 2005 also in 2006 the words fuel and energy were important key words for both undertakings and customers. The easiest way to realize that is looking at gasoline and diesel fuel prices: while suffering from remarkable increase in the middle of the year they still fall by the end of the year. Rising and falling prices for motor fuels is the phenomenon consumers are used to for a long time. It should be noted yet that both electricity and natural gas, and district heating sectors as well are directly or indirectly dependent on the world market price for oil. This does not have a direct impact on electricity consumers in Estonia, as the major portion of electricity is produced from local oil shale. However, consumers of natural gas and district heat are still influenced, as the natural gas price directly depends on oil price in the world market.

Another key word in 2006 was the future of electricity production in Estonia. As it is explained below in the present report the most critical year is likely to be 2016, when most of the boilers of *AS Narva Elektriijaamad* energy blocks are not going to comply with the EU environmental requirements any more and have to be closed down. According to prognoses a power demand in the mentioned year shall be 2000 MW. This means, at least 1300 MW of new capacity should be implemented. Saying in other words, about two thirds of the demand is missing in a 10-years period.

It is natural that the state owned *Eesti Energia AS* is undertaking actions in order to provide the needed capacity. Thus, as one of the alternatives, negotiations have been initiated with Latvia, Lithuania and Poland on the matter of possible erection of a new nuclear power plant in Lithuania. The issue of future energy supplies have become especially acute in Estonia and before the March 2007 parliamentary elections it was one of the hot topics in the elections rally. Also, the theme is constantly observed in the local media, while the range of ideas spreads from one extreme to the other, like: beginning from an idea to cover all the demand by windmills erected in the Baltic sea until the idea of erecting of Estonian own individual nuclear plant. The Energy Market Inspectorate in an opinion that such an open public discussion is welcomed, as it directs also governmental activities towards solving the power supply questions by 2016.

Regarding natural gas consumers, the year 2006 was not a pleasant one for them as well. They were surprised by one and a half times price increase, which in turn was transferred to a price jump for a large part of heat consumers. Unfortunately, the Energy Market Inspectorate has rather limited possibilities for protection of gas consumers' interests. It can be practiced only through the network services' price regulation. In connection with that it is nice to realize that the network charges of the largest gas network operator *AS EG Võrguteenus* (a daughter company of *AS Eesti Gaas*) remained in the level of 2005. In fact, the infrastructure cost for a typical gas burning district heating boiler plant is below 10 per cent of the sale price. For household gas consumers the same indicator is between 10 and 20 per cent, depending on a consumer. For comparison, the share of network services in the consumer price of household electricity consumers is up to 60 per cent. This shows that the Energy Market Inspectorate shall have an important role in the consumer price formation also in the open electricity market conditions.

An important circumstance to consider is that electricity and gas, as well as district heat reaches customers by means of respective network infrastructure, while the charges for using of an infrastructure and the network are completely independent from oil price fluctuations in the world market. As an infrastructure is a natural monopoly, its price regulation is under control of the Energy Market Inspectorate. The formation of infrastructure service prices first of all depends on local economic situation, such as investment needs, changes in the prices for goods and services according to national rate of inflation, technical efficiency. Thus, infrastructure charges have no relation to the changes in the world market fuel prices, the prices for those services are stable and as a rule, change at a slower rate than the rate of inflation. According to enforced law the supplier has to separate on its customer bills the cost for network service or, what is the same, for using of an infrastructure and the cost for energy or fuel. Thereby customers can follow what their electricity or a gas bill's total is formed of.

According to the EU Electricity and Gas Directive electricity and gas customers should have a non-discriminatory access to the network and should be able to choose their supplier freely and change the supplier, if wished. It can be compared, for example, with telecom service market in which customers can change the service provider/operator, while the network owner must give access to his telecom network to all operators. Estonia has a transitional period until 2013 for electricity market opening. By 2009 35 per cent of the market should be opened. This means that already then larger industrial consumers can themselves choose the preferable supplier or producer of electricity. As regards gas market there is no transitional period and according to the new Natural Gas Act that entered into force in the end of 2005 all industrial and commercial consumers have the right to choose supplier.

A significant development in 2006 was the continuation of indexation of electricity network charges. Namely, beginning from 2005 the network charges are approved for a three-year period and adjusted annually according to the rate of inflation and the volume of sales. Based on the knowledge and experience we have today it can be concluded that the indexation has been successful and the same approaches shall be undertaken also in the future.

The present report intends to provide best possible overview of the energy market functioning and the security of supply. We sincerely hope that through this report readers can clarify the organisation of market and its regulation as well.

With best wishes,

Märt Ots
Director General
Energy Market Inspectorate

2. Energy market regulatory authority review

According to the EU Electricity and Gas Directive every Member State shall have an independent energy market regulatory authority. Respective authority in Estonia, the Estonian Energy Market Inspectorate, hereinafter the EMI, was established several years before joining the EU, in 1st January 1998. According to the structural build-up of the Government the EMI is a governmental agency within the area of government of the Ministry of Economic Affairs and Communications. Other market regulators like Railway Inspectorate, National Communications Board, Technical Inspectorate and some others operate similar way. Functions and activities of the EMI are stipulated by the Government of the Republic Act, special laws that regulate energy sector (Electricity Market Act, Natural Gas Act, District Heating Act and Liquid Fuels Act), as well as by the Statute of the Inspectorate. In compliance with above mentioned legal acts the EMI carries out activities in order to perform its main functions as follows:

- approves prices for electricity and gas network services prior to entry into force (so-called *ex-ante* price regulation)
- approves methodologies for connecting with electricity and gas networks prior to entry into force
- approves weighted average price for electricity sold to non-eligible customers and the price of gas sold to household customers
- approves district heat prices in case the undertaking's annual consolidated sales is over 50 000 MWh (for undertakings with sales volume of below 50 000 MWh the price is approved by local municipal authorities)
- approves the price for heat produced in the process of heat and power co-generation
- settles disputes between local municipal authorities and undertakings supplying district heat on the pricing of heat
- approves standard terms and conditions of contracts for electricity network services, electricity supply for non-eligible customers and gas supply for household customers
- issues and revokes activity licences for undertakings providing network services, for producing and sale of electricity, providing of gas network services and sale of gas, producing and sale of district heat
- monitors the adequacy of prices for the balance energy sold by the transmission system operator (National Grid) and the conditions of balance contract
- supervises observing by market participants provisions of law, requirements of regulations, fulfilment of relevant obligations like separation of accounts, independence of the system operator, disclosure of information, third-party access to the network, etc.
- discloses the approved prices, tariffs and charges on its web site
- monitors the quality testing of liquid fuels sold in the market and supervises quality of electricity supply

- settles disputes between market participants in the capacity of pre-court settlement authority
- issues precepts and initiates misdemeanour procedures in the cases of violation of the provisions of law
- cooperates with other Estonian supervisory institutions and regulatory authorities of other countries, as well as performs other functions prescribed by the legislation and by its Statute
- prepares report to the EU Commission on electricity and gas market functioning in Estonia

The EMI is an authority independent in its decision making. According to the Administrative Procedure Act and other legal acts applicable within the energy sector (Electricity Market, Natural Gas Market, District Heating and Liquid Fuels Acts) the EMI issues administrative acts: decisions and precepts. Some examples of those can be as follows. By decisions, for instance, the EMI either grants approval to prices or refuses to. By decisions market licences to undertakings are issued or refused to, or revoked. Also, by decisions customer complaints against undertakings' performance or disputes between market participants are settled. Precepts are issued when provisions of law are violated by undertakings. Law stipulates that the decisions have to be motivated and justified.

A decision, by which the price is approved, may serve as an example. The scope of such decision may be up to 20 pages, as it includes a detailed analysis of all components forming the price and its calculation as well. Another example may be a decision, which settles a complaint of an electricity customer against the performance of his supplier. Such a decision describes the nature of the problem, arguments the EMI's decision and its scope may be up to ten pages. In essence, the latter case forms the so-called pre-court settlement decision. The purpose, indeed, is to give customers a chance to refer to the EMI instead of court. This way a decision can be received faster, as a rule, because law stipulates that the EMI has to make its decision during 60 days at the latest since the application.

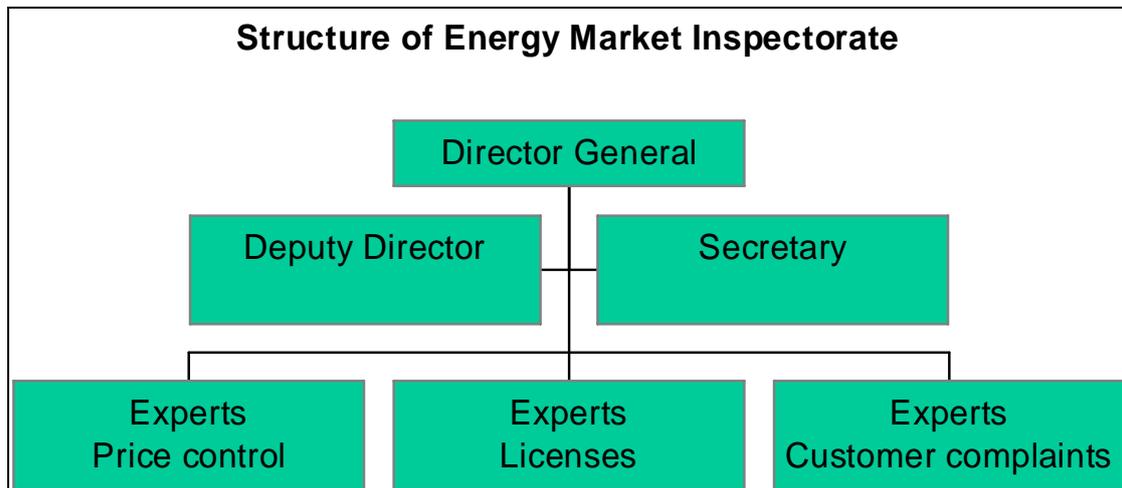
The EMI's decisions are independent both politically and from energy undertakings, guided exclusively by the stipulations of law. The EMI's decision cannot be changed or invalidated neither by the Minister nor by the Government. Respective regulation is prescribed by the Government of the Republic Act. Its paragraph 93 (6) stipulates that the procedure for governmental supervisory control shall not extend to:

- 1) acts of state supervision and decisions made in the application of enforcement powers of the state;
- 2) pre-court settlement of a complaint or protest made with respect to a legal instrument or act of an agency of executive power or of an official, in the cases prescribed by law.

The EMI's decisions and precepts can be challenged with an administrative court in 30 days since receiving of a decision or a precept. Decisions of an administrative court can in return be appealed with a circuit court and the decisions of the circuit court with the Supreme Court. Estonia is the state based on the rule of law and that is why challenging of decisions and precepts shall be deemed a normal process in which

for both undertakings and customers their legal protection is guaranteed. In 2006 the EMI has made altogether 224 decisions and precepts. Compared with the period since 2003 an average annual number of decisions are 200. Only 5 out of them have been lost by court decisions. This can be regarded as a good result and as an indicator of the quality of the EMI's work.

The EMI is one of the smallest state institutions in Estonia, as regards the number of employees. Currently, 11 staff members are employed. Due to the small staff an extremely simple single-level management structure is applied without any specialised department. The Inspectorate is managed by the Director General, in his absence by his deputy. The rest are senior specialists with some specialisation in certain fields of activity. The fields are: price approval, activity licensing, dispute settlement and market supervision. The specialists are subordinated directly to the Director General. Because of the smallness the only administrative employee is the secretary/administrative assistant. Other administrative services like accounting, legal advice, IT and others are outsourced. An example of significant cost reduction is the good cooperation through jointly administered IT system with the Consumer Protection Board.



The EMI is managed by the Director General. The appointment into office of the Director General and all other EMI employees is based on the Public Service Act. The Director General is appointed by the Minister of Economic Affairs and Communications at the proposal by the Chancellor of the Ministry. A precondition for appointment is his attestation by the Commission at the State Chancellery. Director General is nominated without a specified term.

Dismissing from office of the Director General is similar to the appointment, on the basis of the Public Service Act and Government of the Republic Act. According to them the Director General is dismissed from office by the Minister of Economic Affairs and Communications at the proposal by the Chancellor of the Ministry. Director General cannot be dismissed because of political reasons.

The EMI is financed from state budget. The budget for 2006 was 5,076 million kroons (324 000 €). 0,2 million (12 800 €) out of it was the fee for membership in international organisations: CEER (council of the EU energy regulators) and ERA (regional association of energy regulators). 3,2 million kroons (205 000 €) are

employee salaries and 1,676 million (106 200 €) are administrative and R&D cost. The latter also includes office cost, outsourced expert analyses and liquid fuels quality testing cost.

The budget for 2007 is 6,066 million kroons (388 000 €). 0,211 million (13 500 €) out of it is the fee for membership in international organisations, 3,953 million kroons (252 600 €) are employee salaries and 1,902 million (121 500 €) are administrative and R&D cost. Thus, the budget rise is 19,5 per cent, which corresponds to the increase in the volume of work, the enlargement of functions and secures the financing of all activities performed by the regulatory authority.

In accordance with the state budget preparation procedures every spring time the EMI submits a preliminary draft application together with the statement of grounds to the Ministry of Economic Affairs and Communications. The final budget is firstly approved by the Government and afterwards, on the basis of the State Budget Act, by the Parliament. Until now the budget has been sufficient to carry out functions the EMI has. The biggest portion of the budget is the employment cost - in 2007 it is 3,953 million kroons. 0,98 million out of it is social tax, which, according to the Estonian taxation law, is paid by the employer, i.e. in the present context by the EMI. So the actual salaries total 2,973 million, which gives a monthly average salary level of 22 500 kroons. Such a level can be deemed competitive in Estonia and this enables the EMI to employ people with strong professional skills in their specific field. Within the public sector the EMI's salary level is higher than an average, actually one of the highest among ministries, agencies and inspectorates, as per the Public Service Yearbook for 2005. At the same time it is lower than the private business sector salary level.

The EMI's scope of work can be characterised by the number of decisions and precepts made during a year, as well as by the total number of regulated undertakings. Some key performance figures for 2006 can be outlined as follows:

53 licence issuance decisions

39 decisions and precepts on the settlement of market participants' disputes

132 decisions on granting price approval or disapproval

The biggest scope of work is within price control and approval process. Therefore, the best indication of the Inspectorate's performance is the number of undertakings for which price regulation is applied to. As per 2006 the EMI carries out price control on undertakings as follows:

Electricity transmission network	1
Electricity distribution networks	42
Gas transmission network	1
Gas distribution networks	31
District heat suppliers	40
Electricity and heat production, Oil shale mining	3

So the number of undertakings to which regular price control is imposed totals 115. In fact, during the last three years the number of regulated enterprises has increased significantly. The reason is the development of gas networks and acquisition of district heat suppliers by larger companies. In such cases the regulation of price is

transferred from local municipal authorities to the EMI, as provided for by the District Heating Act.

In 2005 the EU association of energy regulators (CEER) prepared a report, in which the rights and obligations of the Member States' regulators, as well as the compliance with the EU directives is compared. In relation to Estonia it shall be mentioned that enough rights is granted to the EMI, but at the same time also the number of obligations, which are needed in order to fulfil the requirements derived from the EU Electricity and Gas Directive. From this point of view the EMI has independence in its decision making, compared to several other regulators. The most positive aspects of these rights in the regulation of energy markets can be outlined as follows:

1. Approve or disapprove prices independently from the government.
2. Issue and revoke activity licences, impose to undertakings development obligations through the conditions of licences.
3. Prepare and disclose reports on the performance of undertakings (the EMI has disclosed reports on disturbances and interruptions of power supplies).
4. Obtain all necessary information from market participants, if needed, to enter their territory and office premises, require copies of original documents, etc.
5. Make prescripts to market participants, initiate misdemeanour procedures and impose penalties in case of violation of law.
6. Neither Government nor the Ministry can revoke the EMI are decisions, nor give guidelines in the decision making process. In its decisions the EMI can only strictly base on the stipulations of law. Therefore, the only way to influence the regulator's activities is amending of law by the Parliament, or amending secondary legal acts (Grid Code, electricity supply quality regulations, and others) by the Government or the Ministry of Economic Affairs and Communications.

The requirement for independence of regulatory authorities is stipulated by the EU Electricity and Gas Directives. With respect to different independence criteria: independence in decision making, management and financing, it can be concluded – the EMI is an independent market regulatory authority.

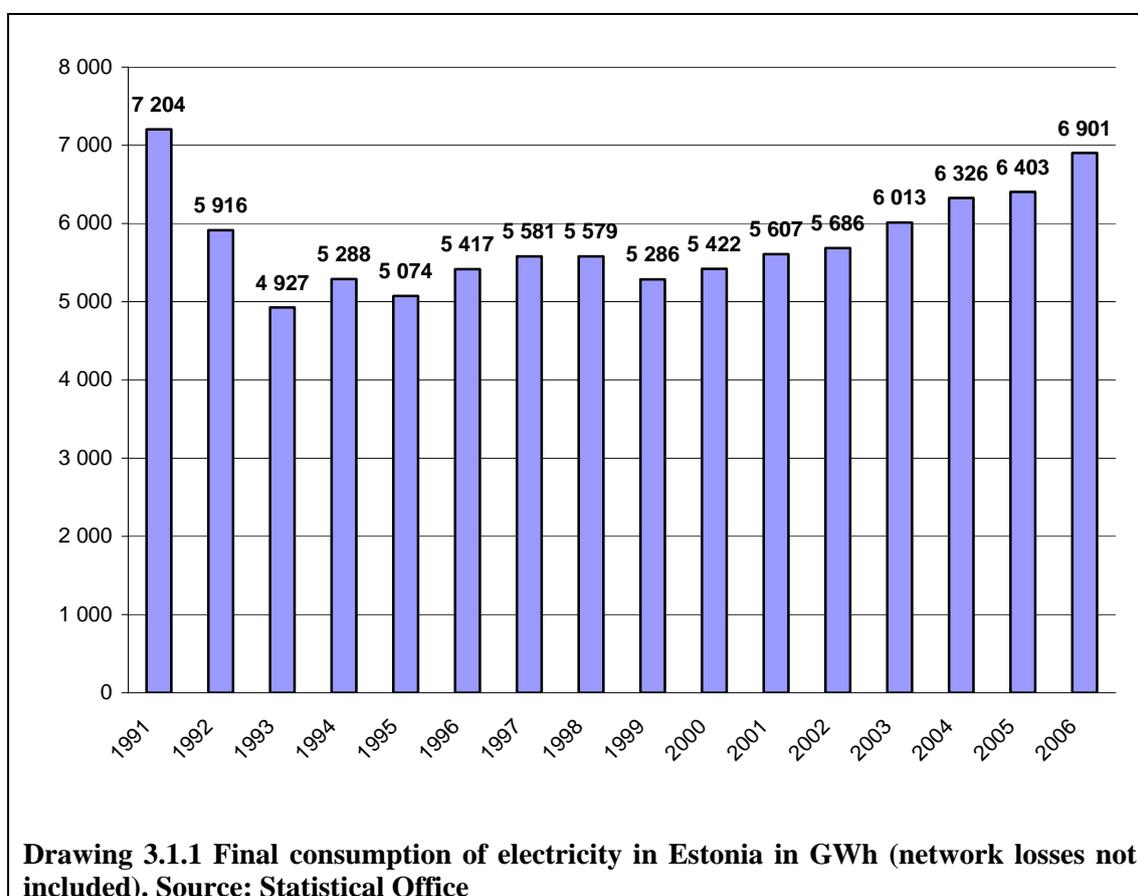
3. Electricity market

3.1. Review of electricity market

The Estonian electricity system has been built up as part of the north-western common power system of the former Soviet Union. Estonia is part of the common synchronised system together with Russia, Belarus, Latvia and Lithuania. The map of the Estonian power system is presented in drawing 3.1.2.

As seen in the drawing, with neighbouring countries Estonia currently has connections only with Russia and Latvia. In the end of 2006 the new 350 MW direct current connection with Finland added. It should be clarified yet that Finland is part of the Nordic power system Nordel, which is not synchronised with the north-western Russian system that Estonia belongs to.

In comparison with other EU countries the Estonian electricity market is very small. In 2006 the load peaked at 1537 MW with an annual production of 8,7 TWh. Out of this 6,9 TWh was domestic consumption, while export totalled 0,75 TWh. However, since 1999 an annual growth in electricity consumption has been 3,5 per cent in average (see diagram 3.1.1). This corresponds to generally known statistical assumption that the rise in electricity consumption forms at least a half of the rise in GDP.

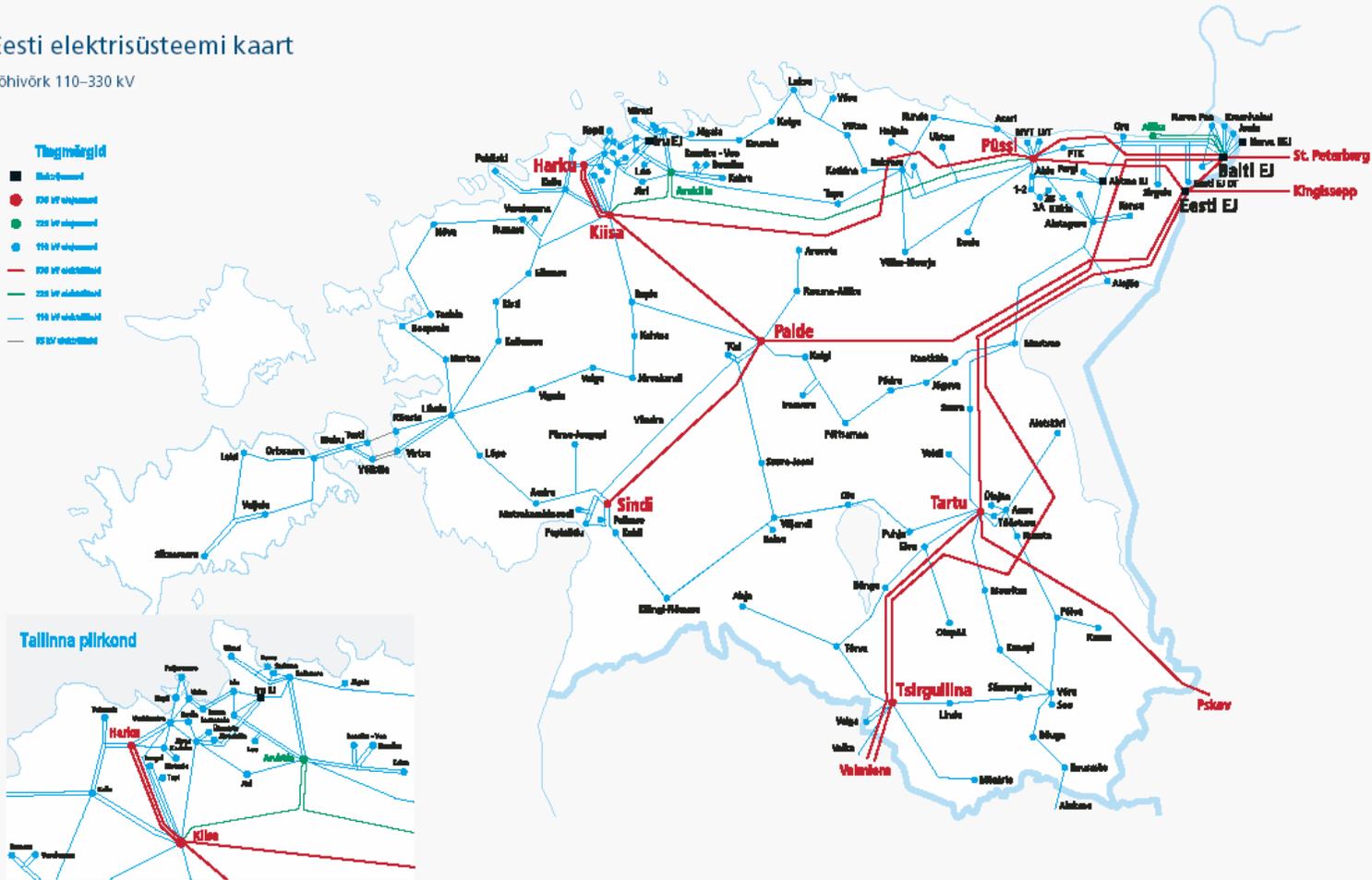


Eesti elektrisüsteemi kaart

Põhivõrk 110–330 kV

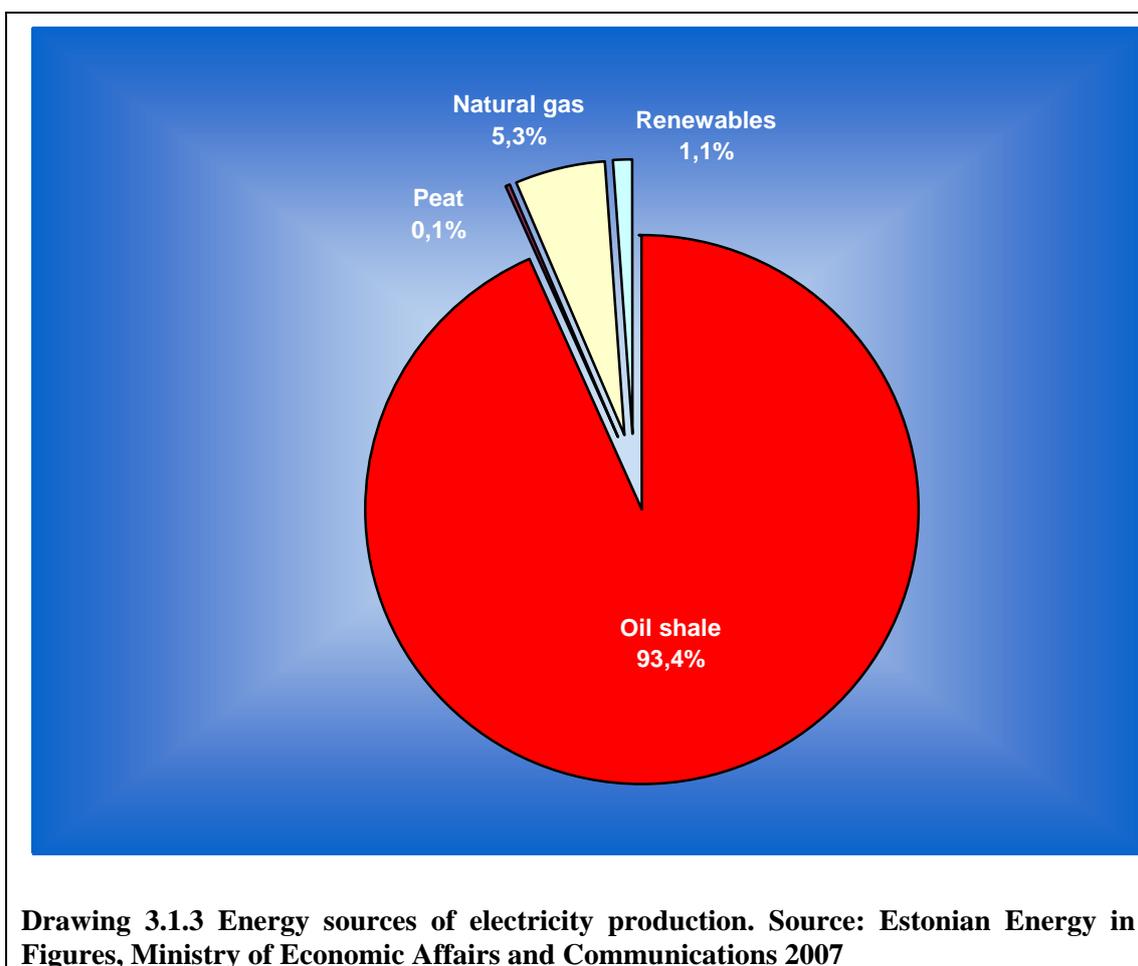
Tingimärgid

- Elektrijaam
- 220 kV ajajaam
- 220 kV ajajaam
- 110 kV ajajaam
- 220 kV ajajaam
- 110 kV ajajaam
- 110 kV ajajaam
- 110 kV ajajaam



Drawing 3.1.2 Map of Estonian power system

Another specific of the Estonian electricity market is an extreme concentration and reliance on a single fuel. Namely, 93 per cent of electricity is produced with oil shale, the share of other fuels is very modest. Thus, the share of natural gas is only 5,3 per cent and the share of renewable sources and peat only 1,2 per cent (drawing 3.1.3). Essentially, all the production is controlled by the largest energy enterprise *Eesti Energia AS* that possesses 96 per cent of installed capacity. In 2006 it gave 95,3 per cent of the Estonian electricity production.



A positive side of the power system in all Baltic countries is the very strong power transmission infrastructure. In fact the Baltic countries are the only EU regions in which transmission power deficiency and the so-called bottle-necks does not exist. At the same time rather poor cross-border connections of Baltic countries with other Member States should be taken into account. In fact, the only one is the 350 MW Estonian-Finnish DC sea cable connection. Since the connection with other EU countries is essentially missing, the area can be regarded as Baltic electricity market in which the non-member Russia, and to some extent also Finland, can be involved.

An extreme concentration features also other Estonian electricity market sectors. Besides the 95 per cent of production market also the transmission network and

adistribution networks with its market share of 85 per cent¹ belong to the *Eesti Energia AS* group, as well as the largest oil shale producer, mining industry *AS Eesti Põlevkivi*.

Formation of the Estonian electricity market dates back to 1998, when the Energy Act was introduced. On the basis of the Act four sectors were regulated: electricity, heat, natural gas and liquid fuels. The regulatory authority – Energy Market Inspectorate was also established upon the Act. In 2003 the Energy Act was replaced by four separate acts: Electricity Market, Natural Gas, District Heating and Liquid Fuels Acts.

In the 1998 Energy Act the status of an eligible electricity customer was defined as follows: the customer with an annual consumption of over 40 GWh. The Electricity Market Act, which entered into force in 1st July 2003, did not change the determination. In 1st May 2004 Estonia joined the EU. Together with the joining an exemption in connection with market opening became enforced for Estonia. According to the exemption 35 per cent of the market shall be opened by 2009, while by 2013 the market shall be opened for all customers. Table 3.1.1 presents the dynamics of market opening. As the openness for 2009 is determined as a percentage and not an annual consumption volume, the definition of an eligible customer for 2009 is a preliminary estimation.

Table 3.1.1 Market opening in Estonia

Year	Definition of eligible customer annual consumption GWh	% of market opening
1995	0	0
1997	0	0
1999	40	10
2001	40	10
2003	40	12
2005	40	12
2006	40	13
2007	40	13
2008	40	13
2009	1,2 ¹	35
2013	All customers	100

¹ Note: the definition of an eligible customer for 2009 is based on an evaluated annual consumption (GWh). The Electricity Market Act stipulates market opening of 35% as of 1st January 2009

According to the Electricity Market Act the non-eligible customers shall buy electricity from their distribution network operator, or by the seller designated by the operator, while the energy has to be produced by either oil shale using Narva Power Plants (*AS Narva Elektriijaamad*), in the process of heat and power cogeneration or by a small producer (of less than 10 MW capacity).

¹ The basis for computation of the market share is the sale of distribution service to final customers less sale to other distribution undertakings.

3.1.1 Cross-border power connections, availability of power reserve and its distribution

As mentioned above, Estonia has electrical power transmission connections with Russia and Latvia, and from the end of 2006 also the direct current (sea cable) connection with Finland. Existing connections are shown in drawing 3.1.2. From Narva two lines lead to Russia at the voltage level of 330 kV and 220 kV with the total capacity of 1050 MW. From southern part of Estonia one 330 kV line with the capacity of 500 MW connects with Russia. In the opposite direction of Russia-Estonia the same line has pass-through capacity of 400 MW. In the southern part of Estonia there are also 330 kV lines to Latvia with the capacity of 750 MW

By statistics of 2006 the peak load from Narva to the direction of Russia was 532 MW, while from south Estonia to Russia 264 MW. The peak load towards Latvia was 679 MW. Hence, the technical capacity is much higher than the actually needed one and a lack of capacity has never been experienced. The transmission capacity data are presented in table 3.1.2. According to the prognosis submitted by the transmission network operator any transmission capacity deficit is not foreseen before 2015. Due to the circumstances the regulatory authority has no need for capacity distribution.

Table 3.1.2 Cross-border transmission capacity

Cross-border transmission capacity and passthrough capacity reserve ****

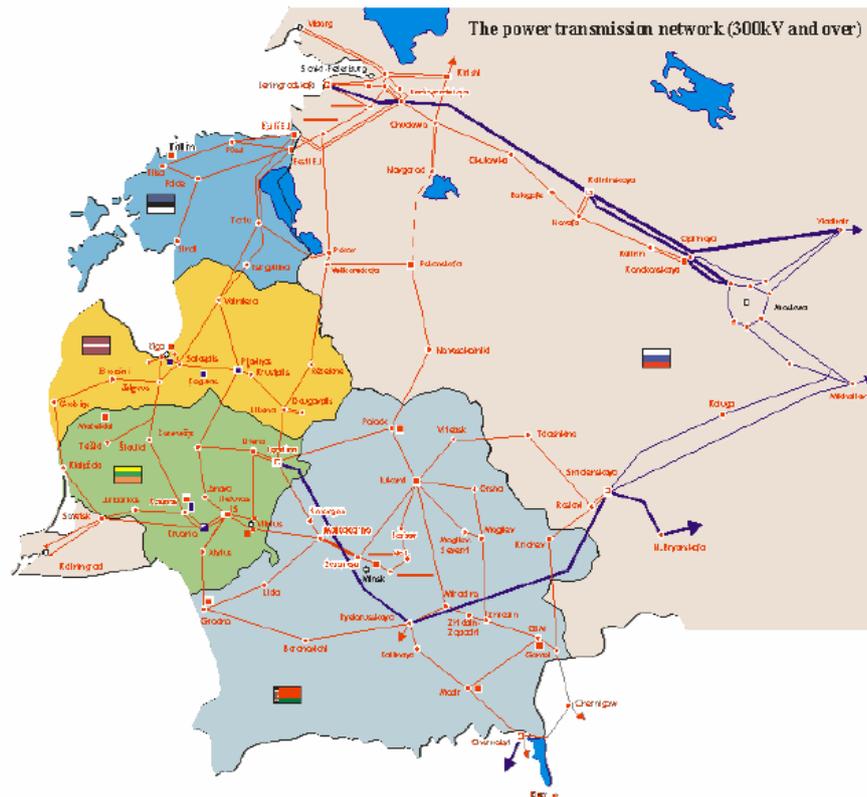
	Technical passthrough capacity MVA				Actual peak load MVA			
	Lines from Narva towards Russia	Line from south Estonia towards Russia	Lines from south Estonia towards Latvia	Line towards Finland	Lines from Narva towards Russia	Line from south Estonia towards Russia	Lines from south Estonia towards Latvia	Line towards Finland
2001	1050/950*	500/400**	750	-	662	321	720	-
2002	1050/950*	500/400**	750	-	698	250	721	-
2003	1050/950*	500/400**	750	-	472	194	663	-
2004	1050/950*	500/400**	750	-	707	194	718	-
2005	1050/950*	500/400**	750	-	450	236	885	-
2006	1050/950*	500/400**	750	-	532	264	679	377
2007	1050/950*	500/400**	750	365	430	204	393	388
2008	-**	-**	-**	365	-	-	-	-
2009	-	-	-	365	-	-	-	-
2010	-	-	-	365	-	-	-	-
2011	-	-	-	365	-	-	-	-
2012	-	-	-	365	-	-	-	-
2013	-	-	-	365	-	-	-	-
2014	-	-	-	1000	-	-	-	-

* - in Narva-Petersburg direction the pass-through capacity is 1050 MVA, while in Petersburg-Narva direction 950 MVA

** - in Tartu-Pihkva direction the pass-through capacity is 500 MVA while in Pihkva-Tartu direction 400 MVA

*** - pass-through capacity depends on internal networks of Russia, Latvia, Lithuania and Belarus - exact data about the development of their transmission networks are not currently available

**** - maximum load in normal conditions with 20% reserve



Drawing 3.1.4 Map of power system of Baltic countries and north-western Russia

3.1.2 Estlink

The Finnish-Estonian connection started operation in the end of 2006. The owner of the cable is *AS Nordic Energy Link*, with its shareholders as follows:

- Eesti Energia AS* (Estonia) 39,9 %,
- Lietuvos Energija AB* (Lithuania) 25%
- VAS Latvenergo* (Latvia) 25%
- Finestlink* (Finland) 10,1%

Both the Finnish energy market regulatory authority and the Estonian Ministry of Economic Affairs and Communications granted an exemption to utilise it as a commercial project, without applying to it the principle of third party free access. All the available capacity is distributed between the owners on contractual basis until 2013. The EU Commission has accepted the exemption. If the owners are not utilising their contractual capacity reservations, they are obliged to facilitate third party access to available capacity. The owner of Estlink, *AS Nordic Energy Link*, is obliged to disclose the information about currently available free capacity on its web site. After termination of the exemption, in 2013 at the latest, the acquisition cost will be included in the regulated asset base of the transmission network operator and third party free access shall be validated.

3.2 Regulation of electricity networks

In compliance with the currently valid Electricity Market Act for electricity networks the so-called exclusive right principle or, what is the same, the principle of concession, is applied. This means that the transmission network operator has an exclusive right to perform power transmission and system services. The same principle is applied to distribution network operators as well, whereas for the operators an individual service area, determined by geographical coordinates, is assigned. Within the area they have exclusive rights to provide network services. Thereby competition between lines and parallel lines are not allowed. The principle of concession minimises business risk for network operators, since the status of a natural monopoly originates not only from the actual situation but also from the provisions of law. Reasoning from the exclusive right the network operators have also an obligation of developing their networks in a manner that secures supply to already connected customers and new connectees.

In Estonia the transmission network operator is *OÜ Põhivõrk*. 100 per cent of its shares belong to *Eesti Energia AS*. The number of distribution network operators is 42, which due to smallness of Estonia is a rather big number. Although, the concentration of distribution service market is very high. The largest enterprise is *OÜ Jaotusvõrk* that belongs to *Eesti Energia AS* and has a market share of 85 per cent. Its annual sale is 5300 GWh (together with the sale to other distribution networks 6000 GWh) and the number of customers is 500 000. The second largest distribution enterprise is *VKG Elektrivõrgud OÜ*, which belongs to Estonian private capital (the sole holder of shares is the largest Estonian shale oil producer *Viru Keemia Grupp AS*). It has 35 000 customers and an annual sales of 262 GWh. The third largest network operator is *Fortum Elekter AS* with sales volume of 176 GWh annually and supplying 23 000 customers. An annual sale of the rest 39-distribution undertakings is below 500 GWh. The largest among those are *OÜ Tallinna Sadama Elektrivõrk*, *AS Sillamäe SEJ* and *AS F-Elekter*. An annual sale of the smallest networks is below 2 GWh.

The market share of distribution undertakings is presented in drawing 3.2.1. The share of small networks is relatively marginal. However, their 7 per cent total share assumes stronger regulation, which is similar to the regulation of large ones.

A summary of basic indicators for network operators is presented in table 3.2.1.

Table 3.2.1 Basic indicators of network operators (transmission and distribution service)

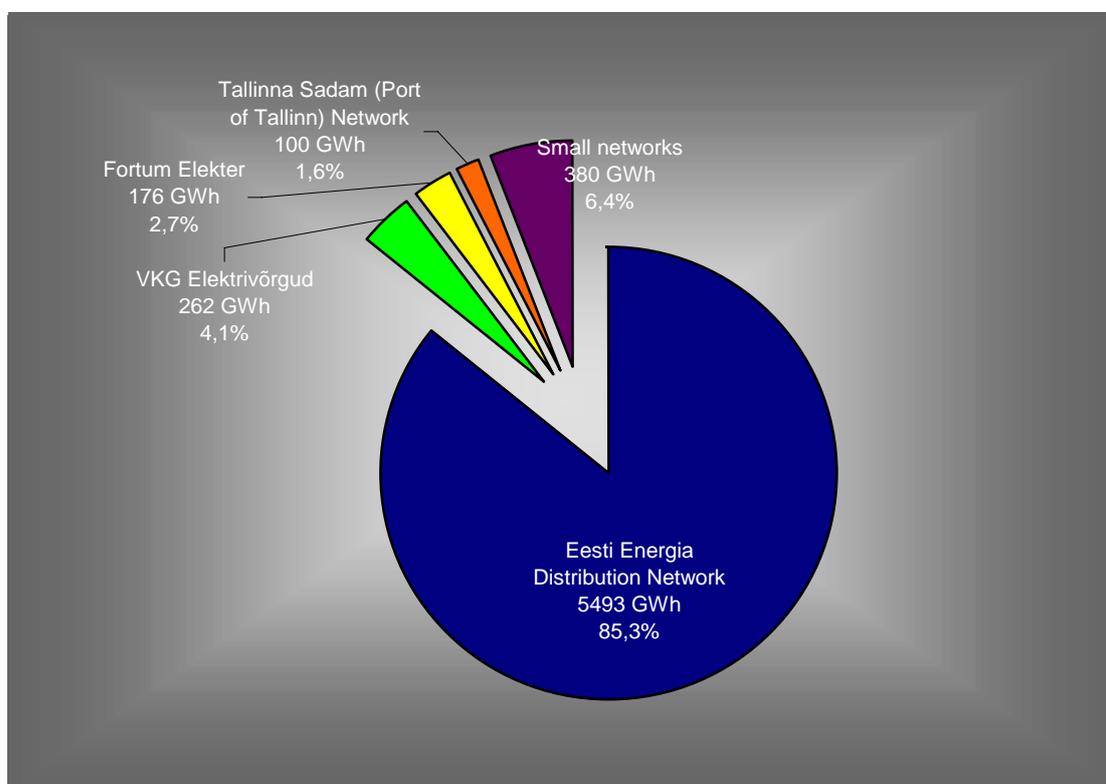
	Number of operators	Average tariff for transmission or distribution €/MWh (Estonian cent/kWh)			Quality of supply indicator –an average time in minutes of an interruption caused by faults per customer
		Large industrial customer	Commercial customer	Household customer	
Transmission network	1	7,64 (11,96)			4,75
Distribution networks	42	13,32 (20,85)	29,00 (45,39)	39,21 (61,37)	265,95

Notes:

According to Eurostat definitions:

- large industrial customer, one with an annual consumption of 24 GWh, max capacity 4000 kW

- commercial customer, one with an annual consumption of 50 000 kWh, max capacity 50 kW
 - household customer, one with an annual consumption of 3 500 kWh.
 Distribution indicators are based on *OÜ Jaotusvõrk* information.
 1 €=15,65 EEK



Drawing 3.2.1 Market share of distribution enterprises

Law provides for equal price regulation for all network enterprises regardless of their size. This adds an extra load for the EMI, as the volume of work with price approval primarily depends on the number of undertakings and almost does not depend on the size of an enterprise.

The only exemption in electricity network operator's regulation is the requirement for legal unbundling of network activities in case the number of customers is over 100 000. Due to that the only operator with legal unbundling is the network belonging to *Eesti Energia AS*, where since 2004 a separate business entity *OÜ Jaotusvõrk* was established. For others law stipulates only separation of accounts and the obligation of auditing.

According to law the EMI approves separately the following charges and methodologies:

- network charges (for electricity transmission and for using a network connection)
- ancillary services provided by network operator (e.g. replacement of main protective fuse or sealing of meters at the customer and some others)
- methodology for calculation of a charge for connecting to the network.

The prices for balance energy and the charges for transit of electricity are not approved. However, the EMI is obliged to monitor justification of those prices. That

means, the so-called *ex-post* regulation is applied to those charges. Regarding cross-border transit of electricity the EU regulation no. 1228/2003 provides for application of a principle, according to which consumers pay for transmission only to the transmission network operator of their own country and the operators clarify balances and cost with each other. According to the regulation the so-called compensation fund is to be established. All transmission operators contribute to the fund and from the fund costs are compensated for all operators participating in the transit of electricity. For example, a customer in Lithuania, buying electricity from an Estonian producer, has to pay for transmission only to his local transmission network operator. The Lithuanian operator, in turn, clarifies its balances with both Latvian and Estonian transmission operators through the compensation fund. Depending on the direction of energy flows a transmission network operator of a respective country may get paid from the fund or has to pay to the fund, and the regulator has to take this into account in approving tariffs for the transmission operator. Thus, for instance, if the Estonian transmission operator gets income from the fund, the price paid by customers for network service shall decrease. In opposite case, if the operator has to pay to the fund, the price shall increase.

According to the EU regulation the EU Commission shall establish methodology for payments into the compensation fund and the amounts receivable from it. As the methodology is not available yet, it is impossible to evaluate whether application of such fund increases or decreases network service tariffs for consumers in Estonia. However, rough estimations show that an impact to consumer prices is likely to be not more than 5 kroons per MWh.²

Above described principles form grounds for the functioning of open EU electricity market. Thereby all producers have equal opportunities, as the customer paid transmission charge does not depend on in which country the producer, whose electricity is bought, is located. Such questions were raised in discussions in connection with the feasibility of a new nuclear power plant to be erected in Lithuania. It has been claimed that one of the potential risks is the transmission charge to be added to the electricity transported to Estonia. In reality there is no such risk, as the Estonian located customers are to pay uniform transmission fee, irrespective where the electricity is produced – in Estonia, Latvia, Lithuania or elsewhere. In other words – consumers are not influenced by the location of producers.

The EMI elaborates unified methodologies for computation of network charges. They serve as the basis for formation of charges and their approval as well. The methodologies are disclosed at the EMI's web site. The site also includes specially elaborated tables for collection of input data to be filled in for approval process. The tables are relatively comprehensive and include technical data and detailed accounts (profit and loss statement and balance sheet, and data about assets). Enterprises shall also submit a detailed investment plan and separately the expected sale volumes of individual network services. Since the tables are comprehensive, and the price is approved by a formula for a 3-year period, it is required to fill them in for respective regulation period once in three years. In the meantime an updating is not required but the EMI is entitled to request additional information about economic performance and technical indicators.

² 0,5 Estonian cents per kWh or 0,32 €/MWh

Submission of input data is an obligation stipulated by law. The EMI can request any information needed for price approval and performing of supervisory proceedings. The EMI employees can also visit the enterprises any time and request data and copies of documents. The practice so far has shown that undertakings do not refuse submitting information.

In the regulation of network prices the EMI has a determining role in the selection of methodologies. However, the following principles are stipulated by law:

- The level of network charges must enable enterprises to fulfil their obligations determined by legal acts and market licence conditions, as well as to have justified return on invested capital.
- The EMI elaborates and discloses unified methodologies for calculation of network charges, which serve as the basis for approval.

So it is up to the regulatory authority to decide upon the selection of methodologies. In the elaboration of methodologies opinion of enterprises has been considered. In fact, it has been the process of long-lasting disputes and mutual consultations between the EMI and the regulated undertakings. In the regulation of network charges the so-called long-term RPI-x indexation method is applied, by which the charges are approved for a 3-year period and adjusted annually.

The formation of network charges is first of all based on the prognosis of sales revenue for a 3-year period. Below a sample table is presented. It gives an overview of network charge formation and cost components included in charges.

	2005	2006	2007
Prognosis of network charges			
Sales volume of network service GWh	1 000	1 030	1 061
Losses according to saving obligation	10,0%	9,5%	9,0%
Losses of electrical energy GWh	111	108	105
Electricity tariff s/kWh	40	40	40
Cost of compensation of electricity losses mill kroons	44,40	43,35	41,88
Charge for network services s/kWh	12,00	12,18	12,36
Cost for network charges mill kroons	133,32	138,65	144,10
Fixed cost	200,00	205,00	210,13
RPI change	4,00%	4,00%	4,00%
Fixed cost saving obligation x	1,50%	1,50%	1,50%
Fixed cost factor (RPI-x)	2,50%	2,50%	2,50%
Fixed cost change mill kroons		5,00	5,13
Capital expenditure mill kroons	31,69	32,56	33,44
Justified return (profit) mill kroons	38,22	38,44	38,59
Allowed sales income mill kroons	447,63	458,00	468,13
Correction factor of network charges		0,9934	0,9923

In the following price/tariff computation principles are described in more detail.

Sale volume of network services

Evaluation of the volumes of sale is extremely important. Fixed cost is dominant in the cost structure of network services. Hence, the higher the sales, the lower the charge for the use of network. Also, in the indexation of network services a formula is used, by which the charge changes along with the change of sale volume. In evaluation of the volume of the sale of network services statistical data are used, i.e.

the dynamics of sale during the last 5 years. At the same time a general rule is considered – together with an economic growth overall electricity consumption grows as well. A 3 per cent annual increase of the distribution service was anticipated for the regulation period of 2005–2007. The increase of sale volume is fixed for the whole regulation period and no adjustments are made within the period. This means that undertakings bare the risk of sale volume. If the volume is exceeded compared to prognosis, an extra income is earned. Otherwise income decreases. The EMI is in a position that the application of such principle follows customer protection interests, as well as leaves for undertakings enough motivation to make efforts for earning extra income through the increase of sale. Besides, through that undertakings are motivated to connect new customers at a faster rate, as the added customers increase sales volume.

Losses of electrical energy

In Estonia the highest potential for loss reduction lies within distribution networks. For that reason an obligation for reduction of power losses is stipulated for all operators. In 2004 the distribution network's losses totalled 10,8 per cent. The target has been set out to achieve loss reduction down to 8 per cent by 2008 and to move on towards further loss reductions. *OÜ Jaotusvõrk* (the distribution network operator with 85% market share) has set up the target in its strategy to achieve 7% loss level by 2010. From that level achieving of further reduction is complicated, as per expert opinions technical loss of 7 per cent in distribution networks is an average value. Further loss reduction is achievable only through technical innovations, which require large investments. As an example, for the largest network operator, *OÜ Jaotusvõrk* that belongs to *Eesti Energia AS* group, a target of 0,5 per cent annual loss reduction obligation has been set. If the operator succeeds to achieve the target earlier, it earns extra income. Otherwise, its failure to achieve the target shall be covered at the cost of its profit. In the transmission network the potential for cutting losses is lower. In 2005 the losses totalled 2,9 per cent and the further potential according to expert opinions is not higher than 0,1 per cent annually.

As outlined above, Estonia has a transitional period for electricity market opening until 2013. This means that a network operator has to purchase electrical energy for re-selling to non-eligible customers and for compensation of network losses either from oil shale fired power plant (*AS Narva Elektriijaamad*), from heat and power cogeneration plants or, from small producers (below 10 MW capacity). The EMI approves the price limit for electricity sold by the power plants in Narva. This price limit serves also as a component of network charges, as these charges must include electricity for compensation of losses.

The level of losses has quite remarkable impact on final consumer price formation. For example, a reduction of losses by 1 per cent at the current price of electrical energy of 40,5 EEK cents per kWh creates savings of about 25 million kroons.

Uncontrollable cost

Cost is considered uncontrollable if undertakings cannot influence it by their economic performance and this naturally means that no saving obligation can be imposed on it. The major uncontrollable cost for undertakings is the cost of network services purchased from other network operators. For instance, *OÜ Jaotusvõrk*

(market dominant distributor operator) buys network services from the transmission operator. In turn, small network operators buy services from *OÜ Jaotusvõrk*.

In addition to services purchased from other operators some other cost components are uncontrollable to undertakings. For example, the state fee (levy) for issuance of activity licences, the level of which depends on the size of an undertaking. Another example of an uncontrollable cost is the so-called obligation to tolerate (technical structures etc.). That means, a network operator has to pay rent to land owners for the structures located on their land, like power lines, transformers and substations.

Fixed cost

Fixed cost is subject to a very deep analysis by the EMI, as this cost component has the biggest impact on price formation. Basic methods for evaluation of fixed cost is comparison with similar undertakings (*benchmarking*), analysis of cost dynamics and the analysis of individual cost components. A precondition for using comparison is an availability of a number of similar undertakings. When it comes to smaller distribution operators it is successfully possible, as the number of them in Estonia is 42. At the same time the comparative analysis (*benchmarking*) is problematic when it comes to *Eesti Energia AS* group. Their only distribution operator *OÜ Jaotusvõrk* is many times larger than the other network operators. The same is true for the transmission network, which can only be compared with other transmission networks. To overcome this problem the EMI has used cooperation with other regulators from Check Republic and Baltic countries.

Other substantial methods in the analysis of fixed cost is the dynamics of cost in time and a detailed analysis of individual cost components. In the analysis of dynamics it is assumed that their growth is not steeper than the inflation reflected by consumer price index. In addition, undertakings shall achieve cost reductions through higher efficiency and productivity. In the analysis of individual cost components justification of them is verified. Basic cost articles of network operators are operation and maintenance, labour expenses, sales cost etc. Among others the EMI verifies in the analysis process whether operators buy services at a market price, whether goods, works and services are purchased in compliance with procurement rules, and alike.

For a regulation period the EMI imposes an obligation to reduce fixed cost, which means that fixed cost shall not develop more rapidly than RPI-x. In practice exercised so far the cost saving obligation or, the value of x has been set to 1,5 per cent, as a rule.

Capital expenditure (depreciation of fixed assets)

For depreciation of fixed assets the EMI uses a regulatory capital expenditure method, which differs from accounting depreciation. Advantages of the regulatory method are its simplicity of computation and transparency for both customers and undertakings, as well as to the regulatory authority. The regulatory depreciation method uses only two fixed assets' depreciation rates. Therefore, it is very simple and easily understandable way to monitor the value of regulated assets and verify the accounting of capital cost.

Accounting of the regulatory depreciation uses a principle, where capital cost is included in the network charges on the basis of its technical life span. It is known that

the life span of networks may last up to 50-60 years. Due to so long life span a number of assets' re-valuations may have taken place, in Estonia also the entire political system has changed. The oldest currently operational equipment was built before World War II. However, a real network development began in years 1940-50. The largest part of networks was erected between 1960-1990. A large scale reconstruction and extension of power networks restarted again since 2000. Thus, equipment with a very different age is in operation.

In the regulatory capital expenditure accounting a principle is used in which, from a certain moment in time, fixed assets are divided into two parts, the old ones and the new investments. For power networks the moment has been selected as 1st January 2003. The assets acquired before that date are regarded old ones and for them an accelerated rate of depreciation is applied. The EMI has ordered an expert analysis from Tallinn Technical University in which the structure and the technical condition of both transmission and distribution network's assets was analysed. As a result of the analysis an average evaluated residual lifetime for old (acquired before 2003) assets is in the transmission networks 16 years and in the distribution networks 11-14 years. The assets acquired since 2003 are considered new investments and for them a single constant weighted average rate of depreciation is applied, with respect to the structure of the assets. Particularly, the evaluated lifetime for new investments of the transmission network is 40 years. The same time in distribution networks appeared to be from 30 to 35 years.

Justified rate of return

A component of price/tariff is operating profit. Since investors have the right to earn profit on the invested capital, it is logical that this component is included in tariffs. However, the profitability should have a reasonable level and be justified, in order to secure a gain for investors. The measure of reasonability is a level, which could be achievable if invested into a business with a similar risk level. At the same time a monopolistic super profit shall be avoided.

Similarly to other regulatory authorities for calculation of the justified return a model is used, which considers a weighted average cost of capital (WACC) and the regulatory asset base. The regulatory asset base is the capital invested into the enterprise. In energy undertakings it is tangible assets and working capital. Thus, the justified return is calculated using the following formula:

$$\text{justified return} = \text{WACC} \times \text{regulatory assets}$$

A weighted average cost of capital WACC is described by the following equation:

$$\text{WACC} = C_{\text{equity capital}} \times \frac{\text{EC}}{\text{DC} + \text{EC}} + C_{\text{debt capital}} \times \frac{\text{DC}}{\text{DC} + \text{EC}}$$

$C_{\text{equity capital}}$	cost of equity capital;
$C_{\text{debt capital}}$	cost of debt capital;
EQ	the share of equity capital;
DC	the share of debt capital

The cost of equity capital is calculated by the following equation:

$$C_{\text{equity capital}} = k_{\text{risk free}} + k_{\text{country}} + \beta \times r_{\text{risk premium}},$$

The cost of debt capital is calculated by the following equation:

$$C_{\text{debt capital}} = k_{\text{risk free}} + k_{\text{country}} + k_{\text{company}}$$

$k_{\text{risk free}}$	risk free rate of return
k_{country}	country risk
β	beta factor,
$r_{\text{risk premium}}$	risk premium
k_{debt}	debt risk premium

The basis for calculation of a weighted average cost of capital is the risk free rate of return. In Estonia governmental bonds essentially do not exist. For that reason the EMI bases in the determination of risk free return on the German 10-year state bond return in the last 5 years. To this an Estonian state risk is added. The 5-year historic return is used in order to eliminate market fluctuations in the calculation of a justified return.

The β factor characterizes the sector risk. The lower it is the lower is also the risk for an individual undertaking. According to the EMI valuation respective figures for electricity networks lay between the values of 0,7 and 1,0. The risk premium indicates how much investors have historically earned in addition to a risk free rate of return. For evaluation of the risk premium both the USA and European securities market long-term indicators have been used. Considering values the regulatory authorities in other countries use and supporting on specialised literature the EMI has accepted the risk premium of 5 per cent. The debt risk premium also depends on individual enterprise and the area of activity. In the regulation of electricity networks the EMI accepts the debt risk premium in the range between 0,6 and 1,5 per cent.

In computation of weighted average cost of capital (WACC) it is important to consider the proportion between equity and debt capital, i.e. the financial leverage. The more debt capital is engaged in an enterprise the higher is the financial leverage. Its level in individual undertakings is quite different. Several enterprises act only on equity capital, their financial leverage is zero.

At the same time, for the largest market participants *OÜ Põhivõrk* (transmission) and *OÜ Jaotusvõrk* (market dominant distributor) the financial leverage is 57 per cent. The cost of equity capital is higher than that of debt capital. Therefore, WACC for those enterprises that use more equity and less debt capital would be higher. In order to encourage enterprises to employ more debt capital the EMI has used the so-called regulatory financial leverage in WACC calculation assuming that most optimal capital structure would be 50/50 (i.e. regardless of the real proportion). Such approach also gives equal treatment of customers, because otherwise customers of undertakings with

the higher share of equity capital would have to pay more for the services provided by their supplier.

WACC for networks depends on the risks involved in individual undertakings. Transmission network has the lowest risk with its nominal WACC at the current interest rates about 6,3 per cent. WACC for distribution networks is determined in the range between 6,8 and 7,3 per cent. Herewith the EMI has evaluated the capital cost for distribution network of *Eesti Energia AS* group somewhat lower than for others because of its dominant position on the market and therefore, having lower risk level.

For illustration and as an example, the following table presents the formation of a weighted average cost of capital (WACC) for *OÜ Põhivõrk* (transmission operator) and *OÜ Jaotusvõrk* (market dominant distributor):

	Transmission network	Distribution network
Risk free rate of return	4,22	4,22
Country risk	0,2	0,2
Risk premium	0,6	0,6
Cost of debt capital	4,82	4,82
Risk free rate of return	4,22	4,22
Country risk	0,2	0,2
Risk premium	5	5
Beta	0,7	0,9
Cost of equity capital	7,72	8,72
Equity/debt capital	50/50	50/50
WACC	6,27	6,77

Regulatory assets

The basis for determination of both the cost of capital (capital expenditure) and a justified return is the regulatory asset base, for which the EMI applies principles, similar to those used by other regulatory authorities. In accounting of the regulatory assets its continuity is of an extreme importance. The accounting of regulatory assets commences from year 2003, where to the book value of assets investments are added and a regulatory capital expenditure is subtracted. For an initial value of assets the accounting (book) value is taken. In exceptional cases, for smaller undertakings, other values, different from the book one, may be accepted in case the book value is obviously below the actual (market) value. Yet there have been cases where the EMI has not accepted re-valuation of assets by undertakings, as the raised value were clearly higher than the actual (market) one. For the three largest network operators (*OÜ Jaotusvõrk*, *Fortum Elekter AS* and *VKG Elektrivõrgud OÜ*) the EMI has ordered an expertise, which show that their assets' value corresponded to the actual one. In determination of assets' value of smaller undertakings the EMI has used a comparative method, where the value of assets of various undertakings were compared per kilometre of lines, number of substations and sale volume. Such method enables identifying undertakings with an obvious over or under valued assets.

3.2.1 Subsidising of renewable sources and cogeneration

Until 1st May 2007 a regulation was enforced, according to which the cost of subsidising of renewable energy sources was included in the tariffs of the transmission network operator. Namely, the operator was obliged to buy electricity produced from renewables at the fixed price of 81 EEK cent/kWh³, in case the producer had been connected to their network. If the producer had connection with a distribution network, the transmission network operator had to pay compensation to the distributor. From point of view of the EMI the scheme was not transparent enough. The reason of opaque – customers had no clear overview of how much should have been paid for renewables, since the subsidy for renewable electricity was included in the transmission service tariffs.

In 1st May 2007 amendments the Electricity Market Act were enforced. Based on the amendments a new support scheme for energy produced from renewable sources, as well for heat and power cogeneration, was introduced. Besides, the amendments also significantly increase the size of payable subsidies. According to the new scheme producers have two options: either to sell electricity at a fixed tariff in the framework of the purchase obligation or, to receive and subsidy and sell electricity at market price. Financing of both the purchase obligation and the subsidy is arranged through the transmission network operator. By the beginning of each calendar year the transmission operator prepares a prognosis of necessary subsidy amount and distributes it between distribution operators proportionally to their sale volume. Every distributor includes that in their distribution service bills. For example, in 2007 consumers' pay for supporting of renewables 2,18 EEK cents/kWh, and in the future it will definitely be higher. Below table 3.2.2 presents the tariffs and subsidies applicable to various producer categories.

Table 3.2.2 Tariffs and subsidies applicable to producers from renewables and for CHP

Kind of energy production	Purchase obligation tariff EEKc/kWh	Subsidy EEKc/kWh	Current market price EEKc/kWh	Assumable sale price EEKc/kWh
Renewable energy sources ¹	115	84	40,95 ³	124,95
Efficient cogeneration ²	81	50	40,95	90,95

Notes: ¹Subsidy is paid if the net capacity is not higher than 100 MW. Wind energy is subsidised until the total wind energy production does not exceed 400 GWh per annum.

²Subsidy is paid if waste, peat or oil shale processing retorting gas is used as the source of energy production. As well it is paid if CHP plant is erected to replace existing district heat supply boiler plant with the capacity not exceeding 10 MW.

³The price for *AS Narva Elektriijaamad*, as for the market dominant producer. The abbreviation EEKc means cents of Estonian kroon.

Considering the market price, which is the sales price of *AS Narva Elektriijaamad* (*Eesti Energia AS* group's dominant producer with 95% market share), the new support scheme creates a very favourable environment for development of renewable sources and cogeneration. However, the new support scheme also generates increase

³ 81 Estonian kroon (EEK) cents per kWh or 51,76 €/MWh

of consumer prices. The EMI has prepared a prognosis with an evaluation of the additional price that customers have to pay for supporting of renewables (table 3.2.3 below).

Table 3.2.3 Estimated impact of purchase obligation and subsidies stipulated by Electricity Market Act to consumer prices in 5-year perspective

Electricity end consumer price formation	New support scheme	Old support scheme
<u>Wind energy</u>		
Total quantity GWh	400	400
Payable subsidy EEKc/kWh	84	40
Amount of subsidy EEK	336 000 000	160 000 000
<u>Cogeneration burning wood</u>		
Total quantity GWh	250	250
Payable subsidy EEKc/kWh	84	40
Amount of subsidy EEK	210 000 000	100 000 000
<u>Cogeneration burning peat and gas</u>		
Total quantity GWh	150	0
Payable subsidy EEKc/kWh	50	
Amount of subsidy EEK	75 000 000	0
Total of all subsidies EEK		
	621 000 000	260 000 000
Estimated electricity final consumption GWh	7 000	7 000
Increase in consumer price EEK cent/kWh	8,9	3,7
Average end consumer tariff (electricity + network service) EEK cent/kWh	85,3	85,3
Added purchase obligation and subsidy EEK cent/kWh	8,9	3,7
Price increase	10,4%	4,4%

Note: The production quantities from respective energy sources are the EMI's estimations.

3.2.2 Regulation period 2005 to 2008

The first year of the regulation period appeared favourable first of all to consumers. Since 1st March 2006 the network charges of *Eesti Energia AS* group's distribution network *OÜ Jaotusvõrk* fell by 1 per cent while the inflation rate being 4,2 per cent or, in real values (without considering inflation) by 5,2%. The transmission network charges rose by 1,3 per cent, but in real values even fell by 2,9 per cent. The decrease of the distribution network's charges was caused by an increase of sale volume, reduction of power losses and savings of fixed cost. The transmission network charges were first of all influenced by the increase of subsidy paid to electricity from renewable energy sources.

In the third year of the regulation period that began in 1st March 2007 the tariffs for distribution service rose by 0,3 per cent (in real values, i.e. under 4,4 per cent inflation rate this meant fall of price by 4,1 per cent). The transmission service tariffs rose by 1,5 per cent (in real values, i.e. under 4,4 per cent inflation rate this meant fall of price by 2,9 per cent). The main reason for price increase was again increase of the purchase obligation of electricity produced from renewable sources.

As it was explained above in 1st May 2007 the Electricity Market Act was amended and on the basis of the amendment the renewable related cost is not any more included in network charges. Instead, this cost is separated in customer bills.

3.2.3 Quality of electricity supply

Quality of supply requirements are based on the Electricity Market Act. According to it the requirements are established by the Minister of Economic Affairs and Communications. Following of the requirements is obligatory and penalties can be imposed (misdemeanour proceedings) in case of violation of the requirements. Quality of supply requirements contain requirements for customer service, and acceptable duration of supply interruptions, separately - those caused by faults and those caused by planned activity. Functions of the EMI are to monitor undertaking's performance in fulfilment of the quality requirements, adequacy of keeping records on quality indicators and in case of violation, to impose sanctions (initiate misdemeanour proceedings). The EMI has elaborated corresponding guidelines and a form for recording of statistics on quality indicators. Disclosure of the indicators on web site is obligatory for all undertakings.

3.2.3.1 Customer service quality requirements

Requirements for the quality of customer service determine maximum acceptable time, during which certain operational procedures have to be accomplished. Below table 3.2.3 presents specific requirements.

Table 3.2.3 Customer service quality requirements for network operators

Operational procedure		Maximum acceptable time for procedure
<i>Within distribution network service area</i>		
Reconnection following lack of payment after bill is paid	If supply interruption in the grid is not needed	5 working days since reception of the payment for reconnection
	If supply interruption in the grid is needed	8 working days since reception of the payment for reconnection
Customer site inspection in connection with metering problems		5 working days since customer complaint
Responding to queries about charges and payments		5 working days since customer inquiry
Deactivation of grid connection at customers request	If supply interruption in the grid is not needed	5 working days since customer request
	If supply interruption in the grid is needed	8 working days since customer request
Meter replacement or change of meter settings at customer request		7 working days since customer request
Customer information about planned supply interruption		At least 2 days prior to planned interruption
<i>Within transmission network service area</i>		
Customer site inspection in connection with metering problems		5 working days since customer complaint
Information of concerned customers about planned works in connection with meter		At least 5 days prior to commencement of works

Coordination of planned supply interruption with customers concerned	Written information by the 15 th date of preceding month
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Undertakings shall submit to the EMI information (in the format of table 3.2.4) about the extent of compliance with the quality requirements. Based on the information it is possible to calculate the percentage of compliance with the service quality requirements. As well it is possible to analyse the trend: whether it is improving or worsening. In case of failure to comply with the requirements customers have the right to file a complaint with the EMI. The EMI may initiate a misdemeanour proceeding in each specific case and impose a fine in an amount of up to 50 000 kroons (3195 €) for a single violation. So it is quite remarkable possible punishment. The money is transferred to the state budget.

Table 3.2.4 Information about customer service quality to be submitted by undertakings

	Customer service quality according to network service quality requirements	Maximum acceptable time for procedure	Criteria	Year	
				Total number of procedures	Accomplished in acceptable time
1.	Within distribution network service area			times	times
1.1.	Reconnection following lack of payment, after bill is paid and if supply interruption in the grid is not needed	5 days	after reception of payment for reconnecting		
1.2.	Reconnection following lack of payment, after bill is paid and if supply interruption in the grid is needed	8 days	after reception of payment for reconnecting		
1.3.	Customer site inspection in connection with metering problems	5 days	since customer complaint		
1.4.	Responding to queries about charges and payments	5 days	since customer inquiry		
1.5.	Deactivation of grid connection at customers request, if supply interruption in the grid is not needed	5 days	since customer since		
1.6.	Deactivation of grid connection at customers request, if supply interruption in the grid is needed	8 days	since customer requests		
1.7.	Meter replacement or change of meter settings at customer request	7 days	since customer request		
1.8.	Customer information about planned supply interruption	at least 2 days	prior to planned interruption		
2.	Within transmission network service area				
2.1.	Customer site inspection in connection with metering problems	during 5 days	since customer application		
2.2.	Information of concerned customers about planned works in connection with meter	at least 5 days	prior to commencing of works		
2.3.	Coordination of planned supply interruption with customers concerned	Written information by the 15th date of preceding month			

3.2.3.2 Network services quality requirements

Regarding network service quality both supply interruptions caused by faults (not planned) and planned interruptions are regulated. Supply interruptions lasting less than 3 minutes are not considered interruptions. According to quality requirements time limits (maximum acceptable durations) are stipulated, during which customers shall be re-supplied. The time limits are distinguished for summer and winter period (table 3.2.5).

Table 3.2.5 Network service quality requirements

	Summer period from April to September	Winter period from October to March
Transmission network		
Acceptable duration of an interruption caused by faults	12 hours	
Acceptable annual accumulated interruption duration	240 hours	
Distribution network		
Acceptable duration of an interruption caused by faults	20 hours	24 hours
Acceptable duration of a planned interruption	10 hours	8 hours
Acceptable annual accumulated interruption duration by faults	120 hours	
Acceptable annual accumulated planned interruption duration	64 hours	

If undertakings fail to comply with the acceptable time limits they are required to pay compensation to customers. As well the EMI may initiate a misdemeanour procedure in each specific case and impose a fine in an amount of up to 50 000 kroons for a single violation.

The EMI has elaborated a specific form for reporting. Undertakings are required to fill it in and disclose. In addition it is required to disclose how many times and in how many grid connection points they failed to comply with the quality requirements. In connection with customer service requirements undertakings shall submit data on how many times they failed to fulfil the service quality requirements. Network operators shall disclose the following network quality (continuity of supply) indicators:

- 1) average fault caused interruption frequency per consumption point per year (CI; SAIFI)
- 2) average fault caused interruption time per consumption point per year (SAIDI)
- 3) average fault caused duration of an interruption (CAIDI)
- 4) average planned interruption frequency per consumption point per year
- 5) average planned interruption time per consumption point per year
- 6) average duration of a planned interruption

All above mentioned data on network quality are disclosed on the EMI web site.

Below table 3.2.6 presents the data that enterprises shall submit on quality of electricity supply. Respective tables are also disclosed in the EMI web site.

Table 3.2.6 Data submitted by enterprises on quality of electricity supply

1.	Interruptions	Maximum time			Unit	Year		
		Transmis sion	Distribution			Total	not in compliance	in compliance
			April 1- Sept 30	March 31				
1.1	No of interruptions caused by force major (e.g. natural disasters)	3 days	3 days		pcs			
1.2	No of fault caused interruptions (excl those named in 1.1)	12 hours	20 hours	24 hours	pcs			
1.3	No of consumption points, where annual accumulated fault caused interruption duration exceeded acceptable	240 hours	120 hours		pcs			
1.4	No of planned interruptions	-	10 hours	8 hours	pcs			
1.5	No of consumption points, where annual accumulated planned interruption duration exceeded acceptable	-	64 hours		pcs			

2.	Security of Supply indicators	Unit	Qty
2.1	Total number of customers	pcs	
2.2	Fault caused annual accumulated interruption duration	minutes	
2.3	Planned annual accumulated interruption duration	minutes	
2.4	Average fault caused interruption frequency per consumption point per year (CI) (SAIFI)	pcs	0,000
2.5	Average interruption time per consumption point per year (SAIDI)	minute	0,000
2.6	Average duration of an interruption (CAIDI)	minutes	0,000
2.7	Average planned interruption frequency per consumption point per year	pcs	0,000
2.8	Average planned interruption duration per consumption point per year	minutes	0,000
2.9	Average planned duration of an interruption	minutes	0,000

3.	Distribution network voltage quality	Unit	Qty
3.1	No of connection points with voltage not complying standard EVS-EN 50160:2000 (incl. acceptable deviation +-10%)	pcs	

3.2.4 Balance responsibility

The Electricity Market Act and the grid code stipulate regulation of balance responsibility in detail. According to it every market participant is responsible for its balance. The balance period is one full hour and the balance day begins at 00:00. A balance provider shall provide the system operator preliminary balance plan for a calendar month, week and day. The final balance plan is provided at 14:00 at the latest in the preceding day.

The market is organised in the principle that the transmission network operator is responsible for the balance of the whole system and there can be many balance providers operating on the market. For providing balance the transmission network operator buys and sells balance energy. The methodology for calculating balance energy price and standard terms and conditions of balance agreements shall be approved by the EMI. In formation of balancing energy price the transmission network operator is obliged to buy and sell electrical energy at best possible price.

Balance is determined by the means of remote reading device (*on-line*) in case the customer's electrical connection capacity exceeds 63A. For determination of other customer's balance standard load curves are used. This means that for household customers an *on-line* metering is not necessary.

Until amending of the Electricity Market Act (i.e. until 1st May 2007) wind turbines were exempted from balance responsibility. According to the amendments wind turbines shall be responsible for their balance since 1st January 2009, similarly to other producers.

Since the Estonian electricity market is opened only in a 10 per cent extent, a real balancing energy market is missing today and distribution network operators are responsible for non-eligible consumer's balance. The biggest balance provider is Eesti Energia AS and it provides service, in which the sold electricity price includes also balance responsibility service or, it is the so-called open supply. The EMI is in a position that effective balancing energy market can appear only when electricity market will be fully opened in 2013.

3.2.5 Unbundling of activities

An overview of fulfilment of activity unbundling requirement is presented in below table.

	Transmission of electricity	Distribution of electricity
Separate headquarters (yes/no)	Yes	Yes
Undertakings acting as separate business entities (yes/no)	Yes	Yes
Separate accounts together with guidelines of the regulatory authority (yes/no)	Yes	Yes
Auditing of separation of account (yes/no)	Yes	Yes
Disclosure of separated accounts (yes/no)	Yes	Yes
Separate management board in which board members of other group undertaking's do not participate (yes/no)	Yes	Yes

According to law the transmission and distribution networks shall form separate business entities and shall not operate in other area of activity than network service, system service and providing of balancing energy. A distributing network shall form a separate business entity if the number of customers exceeds 100 000. The latter applies in reality only to the distribution network of *Eesti Energia AS* group, *OÜ Jaotusvõrk*, as all other networks have less than 100 000 customers. The Electricity Market Act stipulates also the requirements for management of legally separated transmission and distribution network operators. Thus, a member of the management board of a network operator may not at the same time be a member of the management board of another electricity undertaking belonging to the same group. However, it is allowed to be, at the same time, a member of the management board of a network operator and a member of the supervisory board of another electricity undertaking belonging to the same group.

A distribution network operator with the number of customers below 100 000 shall separate its accounts as follows:

- provision of network service
- sale of electrical energy
- secondary (ancillary) activity.

The accounts of undertakings shall be kept on the same principles as separate undertakings operating in the same area of activity should have kept. Therefore, a distribution network operator that is not required to form a separate business entity is obliged to keep its account similarly to a business entity and shall submit in its accounts balance sheet, profit and loss account, management report and other reports provided for in the Accounting Act separately for network services, electricity sales and secondary (ancillary) activities. Respective information shall be submitted in their annual report and disclosed. The separation of accounts shall be audited and auditor's opinion attached.

The EMI has elaborated and disclosed on its web site respective guidelines and a reporting form, which can serve as the basis for separation of activities for undertakings

In addition to the separation of network services, sale of electricity and secondary activity undertakings shall also separate their accounts by different services (so-called the regulatory stipulated activity separation).

The transmission network operator shall separate its accounts as follows:

- sale of network service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)
- transit of electrical energy (*ex-post* regulation, the EMI has the right to verify justification of prices)
- charges paid by customers for connecting to the network (*ex-ante* regulation, the EMI approves methodology for calculation of connection charges separately for every undertaking)
- sale of balancing energy (*ex-post* regulation, the EMI has the right to verify justification of prices)
- secondary (ancillary) activity.

A distribution network operator that is required to form a separate business entity shall also separate its accounts as follows:

- sale of network service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)
- charges paid by customers for connection to the network (*ex-ante* regulation, the EMI approves methodology for calculation of connection fees separately for every undertaking)
- secondary (ancillary) activity.

A distribution network operator that is not required to form a separate business entity shall separate its accounts as follows:

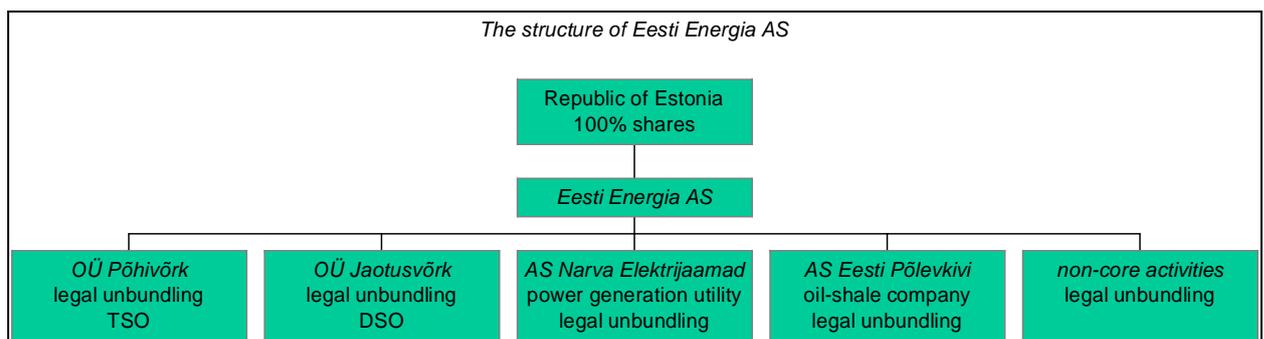
- electricity sale to non-eligible customers (the EMI approves weighted average price)

- electricity wholesale, including to eligible customers (the EMI has the right to verify whether cross-subsidising is avoided in the sale of electricity to eligible and non-eligible customers)
- sale of network service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)
- customers' paid charges for connecting to the network (*ex-ante* regulation, the EMI approves methodology for calculation of connection charges separately for every undertaking)
- secondary (ancillary) activity.

3.2.6 Ensuring of equal treatment

All network operators are obliged to elaborate an action plan with the measures for equal treatment of other electricity undertakings and customers, including duties of employees in implementation of these measures. The EMI has prepared guidelines for the elaboration of such plan. It is disclosed on the EMI's web site. According to the guidelines it is recommended to compile the plan in a 3-year perspective. Annually, a report shall be submitted to the EMI on implementation of the plan. Both the plan and the report are public documents and all interested parties can get acquainted with them. If the EMI is in an opinion that the plan is not sufficient and does not comply with requirements, a revision of the plan and its changing may be required.

In Estonia one energy undertaking can be considered as the vertically integrated one. This is *Eesti Energia AS* group. The group possesses oil shale production, electricity generation, transmission network, distribution network, sale undertaking and undertakings dealing with secondary activities. 100 per cent *Eesti Energia's* shares belong to the Estonian state. The structure of *Eesti Energia AS* is presented below.



Most important issue is securing of independence of the transmission network operator *OÜ Põhivõrk*, as besides provision of transmission network services it is also responsible for operation of the entire power system and securing of balance. *OÜ Põhivõrk* is a separate independent business entity. The management board has three members and according to law the person in charge may not at the same time be a member of the supervisory board of another electricity undertaking belonging to the same group. The supervisory board consists dominantly of the group's Mother Company members of the board. The office together with dispatch centre is located in a separate building. The transmission network operator has its own logo, which is apparently very similar to the group's logo. The only difference is the text

“OÜ PÕHIVÕRK”. So it should be noted that it seems to be intended to present the transmission network as part of the group.



A similar situation is in the distribution network that belongs to Eesti Energia group, in which the undertaking's members of the board do not belong to management nor supervisory boards of other undertakings. It has an office building separately from the group's mother company and its own logo, which is again extremely similar to the group's one.

An extremely important factor from the point of view of network's independence is the management of undertakings. Essentially, the Mother Company's competence should only be limited to investments into productivity of assets, annual budget and approval of the long-term business plan. In the rest the networks should be independent in their decision making. In this respect it should be mentioned that together with the formation of separate business entities in 2004 their independence has significantly risen and the EMI has not observed intervention into direct management by the group's Mother Company.

As regards the transmission network an important issue is the action plan for possible crisis situations, in which limitation of consumption may become unavoidable. The operator has a detailed plan for possible crisis situation.

In promotion of networks' independence and their price regulation it is important to supervise the price formation for services purchased from Mother Company and other undertakings belonging to the group. The services bought from Mother Company and other undertakings of *Eesti Energia AS* have important share in the cost structure of both the transmission and the distribution network. In the services bought from Mother Company a remarkable share have IT services, rent of office premises (these are owned by Mother Company), as well as security, legal and other services.

The largest part of outsourced services from undertakings of the group is the electricity purchased for compensation of power losses from power plants in Narva, which belong to the group. This directly complies with the Electricity Market Act, which stipulates purchase obligation from *AS Narva Elektriijaamad* (Narva power plants). Similarly, the transmission networks purchase from Narva power plants also a reserve capacity that is needed for provision of system services. Two other undertakings belonging to *Eesti Energia AS* group are *AS Televõrk*, that provides telecommunication services, and *AS Elektriteenused*, providing electricity network construction, repair and maintenance services. From these both the transmission and distribution network operators' purchase above mentioned services.

Regarding services purchased from Mother Company the EMI has followed principles that the prices may not exceed the market ones and all procurement rules have to be

complied with. According to the Public Procurement Act network undertakings as natural monopolies have to fulfil certain rules and requirements in their procurements.

3.2.7 Equal treatment action plan

Proceeding from the EU directive and the Estonian Electricity Market Act network operators are obliged to elaborate and disclose an action plan with measures for equal treatment. The purpose of the action plan is to secure equal treatment of all market participants and present network operators' activities in order to reach this goal. The EMI has prepared guidelines for elaboration of such plan. It is disclosed on the EMI's web site.

Most thoroughly the EMI analyses the action plan for equal treatment prepared by *OÜ Põhivõrk* (transmission network and system operator) that belongs to *Eesti Energia AS* group. Independence of the system operator is especially important in free market conditions, where the operator has information about offers of various electricity producers and sellers and possible leakage of this information is similar to stock exchange *insider* phenomenon, which can give advantages for some market participants before others. Thus, the EMI submitted a number of proposals for making their plan more concrete. The EMI's position is that in the plan more attention should be paid to the following aspects:

- securing independence of the management board
- separating areas of activity and auditing
- purchasing services from inside the group
- securing information confidentiality inside the group
- public relations.

OÜ Põhivõrk took the EMI's remarks into account and submitted and disclosed on its web site a supplementary action plan. The plan has also been supplemented with the schedule timing of the actions. In EMI's opinion the plan is prepared in a good level and significant development has taken place, compared to previous versions.

Below the EMI presents its evaluation of the transmission and system operator's independence.

3.2.7.1 Unbundling of activities in the transmission network

Eesti Energia AS, as the Mother Company of the transmission network operator, fully fulfils the requirements the EU Internal Electricity Market Directive and the Estonian Electricity Market Act. The activities of the operator are limited to provision of network services and sale of balance energy, and since 1st May 2007 also administering of the fund for supporting of producers using renewable energy sources. In addition, the enterprise has separated its accounts according to requirements elaborated by the EMI as follows:

- sale of network service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)

- transit of electrical energy (*ex-post* regulation, the EMI has the right to verify justification of prices)
- charges paid by customers for connecting to the network (*ex-ante* regulation, the EMI approves methodology for calculation of connection charges separately for every undertaking)
- sale of balancing energy (*ex-post* regulation, the EMI has the right to verify justification of prices)
- secondary (ancillary) activity.

In conclusion the EMI is in a position that the transmission and system operator fulfils requirements provided for by law and the separation of accounts secures transparency of service price formation, as well as avoids cross-subsidising of activities.

3.2.7.2 Management of the transmission network operator

According to the Electricity Market Act a member of board of another enterprise of a group may not be in the board of the transmission operator and may not be in charge of the company. It is allowed to be, at the same time, a member of the management board of a group's enterprise and a member of the supervisory of a network operator. Currently, the management board has three members, while the supervisory board has four members. Therewith, three members of supervisory board are also members of *Eesti Energia AS*, as the Mother Company's, management board.

It should be considered a positive development that the management of the enterprise has been enlarged from one to three members. The EMI's opinion is that this facilitates to company's independence, since decisions are made collectively. According to their action plan members of the board are paid for fulfilment of duties. The compensation is fixed by contract and it can be changed only upon agreement between the parties. The board members are paid bonus on the basis of a system of balanced scorecards (metrics). In general, such work arrangement should secure independence of board members in their decision making. Namely, *Eesti Energia AS* group has not formed a legal person for electricity sale and trading. These functions are carried out by *Eesti Energia AS*, as the sole owner of the transmission network.

Eesti Energia AS sells electricity on domestic market, is active in electricity trade, as well it is the balance operator, i.e. is responsible for the balance between production and consumption. At the same time, *Eesti Energia AS*, as the sale company and the balance operator is responsible before the transmission operator and, if needed, is forced to follow orders of the latter. Thus, there is an obvious possibility for a conflict of interests, as members of *Eesti Energia AS* (sale company) management board are also members of the transmission operator's supervisory board.

The EMI is in a position that the solution would be establishing of a sale and trade company as an unbundled legal person. In such case both the transmission and sales would be on the "same level" in relation to the group. That would eliminate the existing conflicting scheme, in which the balance operator is in a higher level in the group than the transmission operator, which supervises the balance operator.

The EMI is also in a position that *Eesti Energia AS* group has to deal with the guarantees of the transmission operator's board members and clarify the procedures

according to which an impeachment of board members is possible. This should avoid situations, where management should make decisions, which may be harmful for the group as for one of electricity sellers, but at the same time necessary for the organisation of a fair market. This problem can also be solved to a certain extent by establishing of a separate sales enterprise.

The action plan defines also the functions to be performed by both the management and supervisory boards. Particularly, the supervisory board's competence is to establish daughter companies, approval of budget and business plan, approval of extra budgetary investment programmes, borrowing and lending beyond daily business framework, and others. Daily operations, including decisions on treatment of market participants, are completely the competence of management board.

Conclusively, the EMI's position is as follows. A positive development in the management of the transmission network operator has been the enlargement of the board. The functions and competence of both management and supervisory boards are well defined. In the implementation of the action plan the supervisory board has no possibilities to intervene in economic activities of the transmission operator, nor can it affect decisions on market participants. At the same time the EMI has an opinion that *Eesti Energia AS* group should establish sales company in the form of a separated legal person, in order to avoid possible conflict of interests between sales and the transmission operator. Besides, it is recommendable to elaborate procedures and criteria for impeachment of members of the management board.

3.2.7.3 Equal treatment of market participants

From the point of view of equal treatment of market participants it is extremely important to secure confidentiality of information. As the transmission network operator is at the same time also the system operator (responsible for system balance and security of supply in every time moment) it possesses confidential information about market participants acting on the market. Similarly to stock exchange the transmission operator is like a stockbroker having confidential information, using of which can give advantages to certain traders. As the owner, *Eesti Energia AS*, is one of the market participants to be treated equally with others, it becomes crucial to secure information. The information system of the transmission operator is connected to the system of *Eesti Energia AS* group. The action plan describes that according to internal regulations other undertakings of *Eesti Energia AS* group have no access to the confidential information of the transmission operator. The plan provides for review of the internal documents dealing with equal treatment measures, in order to guaranty confidentiality. The deadline for review is 1st April 2008.

As one of the competences of the transmission operator is securing of supply and balancing of the power system, equal treatment of market participants is extremely important also regarding this aspect. According to the Electricity Market Act the transmission operator can give orders to consumers, producers, network operators and other market participants for adjusting their consumption-production regime, in order to safe-guard security of supply in the entire system. It is extremely important that

both market participants belonging and not belonging to Eesti Energia group are treated equally.

In accordance with the action plan safeguarding of security of supply is based on respective internal documents established by *OÜ Põhivõrk*, including the Procedures of Operational Control of the Estonian Power System. For improving cooperation with larger clients agreements are concluded or, are under conclusion. The agreements facilitate to better technical cooperation on the security of supply. In order to secure cooperation with neighbouring power systems agreements on parallel operation are also concluded.

In emergency situations the guidance is the instructions for liquidation of emergency consequences elaborated by the Ministry of Economic Affairs and Communications, as well as the plan for consumption limitations, which is adjusted annually. The orders issued by the system operator proceed from the needs of the security of supply. In order to follow the requirements *OÜ Põhivõrk* has established documents that describe actions of the system operator.

OÜ Põhivõrk constantly develops the network and takes care for the pass-through capacity of transmission lines. In the coming 5-year period no capacity limitations are foreseen, except in Narva-Tallinn direction in connection with the Estonian-Finnish sea cable Estlink. *OÜ Põhivõrk* has an agreement with its owner according to which in case of a pass-through congestion the electrical energy transmitted to Estlink can be limited as well.

If a pass-through congestion still appears by a coincidence of several circumstances, then *OÜ Põhivõrk* will limit consumption by distribution networks in accordance with the limitation plan agreed with the network operators in beforehand. The plan is adjusted annually. Currently, there is plan for 2006/2007. The transmission dispatch centre operator can decide upon actual situation, which consumer to interrupt first, i.e. interruption of whom is most efficient.

Compared to other EU regions the Estonian situation is less complicated, because the Baltic power system is the only one in which there is currently enough excess pass-through capacity and the transmission operator has no need for the distribution of “deficiency” service. A shortage is likely to occur in Estlink, but until 2013 it is a commercial connection, in which capacity is shared between the owners on a contractual basis.

Connecting of market participants to the transmission network is important from the point of view of equal treatment, first of all in relation to producers, as consuming customers connect to a distribution network, as a rule. Few exemptions from that are *AS Estonian Cell* and *Galvex Estonia OÜ*, which have connected to the transmission network during last years. That is why equal treatment of producers is especially important, as some of perspective entities that are planning to connect, belong to *Eesti Energia AS* group. During last years the transmission operator has issued specifications for connecting of wind turbine (windmill) parks. As regards connecting of producers a situation can appear that the transmission operator has to distribute so-called “shortage source” or saying it in other words, existing network may have not enough capacity in a specific area/territory for connecting all potential applicants that

are willing to connect. The Electricity Market Act provides for refusal, first of all in cases where existing network structure has lack of transmission capacity for network service.

According to the action plan the transmission network operator uses a common form in concluding connecting agreements with all connectees. The form is disclosed on their web site. In order to secure equal treatment for all customers an internal procedure for connecting has been established, following of which is obligatory for all employees dealing with connection issues. The charges/fees for connecting to the network are calculated on the basis of actual justified cost. The fees include the cost of new equipment and the cost of reconstruction of existing installations in order to connect the new capacity. In the connecting procedures both the entrepreneurs belonging to a group and not belonging to group are treated equally. Equal treatment is ensured for all entities willing to connect through same applicable connection conditions and common (standard) connection contracts. In case of refusal to connect the transmission operator follows principles stipulated in the Electricity Market Act, its paragraph 65. In situations if connecting is related to deficiency of pass-through capacity the customer can get a connection offer for a maximum possible capacity. If connection offer cannot be issued because needed capacity is unavailable the connectees is added to a waiting list. Applications in the waiting list are processed, when requested capacity becomes available, on the principle of historic priority – earliest application in the list gets a connecting offer first.

In conclusion, activities of the transmission network operator related to equal treatment of market participants can be considered satisfactory and the EMI has not observed cases of unequal treatment. The company has internal regulations and rules that regulate actions and decisions to be made when *Eesti Energia AS* group's undertakings are concerned. Whereas the EMI is in an opinion that the transmission network operator should further develop independence of the energy trade (including balance energy) information system from the group. It is recommended to consider establishing an information system, which is completely independent from the group.

3.2.7.4 Buying goods and services from enterprises of Eesti Energia AS group

Buying goods and services from enterprises of *Eesti Energia AS* group is important first of all from the point of view of prices. Whereas, all Estonian citizens buy services from the transmission network operator directly or indirectly. Thus, it is the case of highest monopoly level and that is why in all purchases procurement rules have to be strictly followed and goods and services have to be bought at best possible prices.

Prices of goods and services bought by the transmission network operator are reflected in the tariffs of network services approved by the EMI. That is why the EMI has analysed in the approval process whether the prices of goods and services bought from enterprises of the group are not higher than market prices. Also, in 2006 the EMI has ordered and analysis from consultancy *Hevac OÜ*, in which justification of investments, procurement procedures and other investment related aspects were analysed. As the result it appeared that the transmission operator has followed good practice in its procurement procedures, which are generally in a good level. Bidders

from both inside the group and outside of it have equal conditions. As regards buying of other goods and services the EMI has followed principle that services have to be bought at common market prices. In the approval process a thorough analysis has been carried out on the justification of prices for services bought inside the group. If the transmission operator bought services from inside the group at higher prices than accepted by the EMI, then consumers would have not suffered from, but the difference would have been paid for at the cost of company's profit.

Conclusively, the EMI position is that purchasing of goods and services is done on equal basis from both undertakings inside and outside of the group.

3.2.7.5 Public relations

In accordance with the Electricity Market and Public Information Acts network operation undertakings are obliged to maintain a web site and to disclose on it information, which is important to customers, like charges for network services, standard terms and conditions for network service contracts, price for balancing energy, standard terms and conditions for balance agreements, conditions for establishing a network connection and other information. The EMI opinion is that the transmission network operator fulfils public information requirements derived from relevant legislation and during the last five years it has disclosed additional information important to market participants, like system peak load, transmission capacity of the lines, load of network losses and other. On the site it is also possible to get information about their economic performance: annual accounts, action plans for equal treatment, etc. In addition the operator has hired a public relation manager, independent from the group. The person is responsible for publishing information, press releases, etc.

Conclusion: the transmission network operator has significantly developed the information disclosed on its web site and the EMI opinion is that their web site is one of the best among all energy undertaking's sites.

3.3 Competition in electricity market

3.3.1 Wholesale market

The main features of the Estonian electricity market are transitional period until 2013 and an extreme concentration of the market. Until 2009 the market is opened only by 10 per cent and since 2009 until 2013 the intended openness range shall be 35 per cent. Whereas 35 per cent openness means that the eligible customer qualification criteria assumes an annual consumption of at least 1,2 GWh and an estimated number of eligible customers shall total 450. Although three independent electricity sellers have commenced commercial operations, their activities have still been relatively modest. The largest electricity wholeseller in Estonia is *Eesti Energia AS* with an evaluated market share close to 100 per cent. It is extremely difficult to foresee how many eligible customers will change their supplier after the market opening in 2009.

Considering the good market position of *Eesti Energia AS* it can be assumed that majority of eligible customers will remain after 2009 as clients of *Eesti Energia AS*.

Compared to other EU Member States one more specific of the Estonian market is its little volume. In 2006 electricity sale totalled only 7 978 GWh and system peak load 1 555 MW. In winter 2007 the peak load was slightly lower, 1 537 MW.

Some general indicators of the market are presented in below table 3.3.1.

Table 3.3.1 General indicators of wholesale market. Source: Statistical Office and OÜ Põhivõrk

	Electricity consumption GWh ²	Peak load MW	Installed capacity MW	No of producers with more than 5% market share	Market share of 3 largest producers %	Average market price c/kWh ¹
2001	6 970	1321	2876	1	99	
2002	6 940	1336	2726	1	99	
2003	7 210	1475	2723	1	99	
2004	7 440	1318	2675	1	99	
2005	7 510	1331	2433	1	99	40,95
2006	7 978	1555	2059	1	99	40,95

Notes: ¹Narva Elektriijaamad production price

²Including network losses

As seen from the table electricity consumption has been gradually increasing since 2001. Estonia is net exporter, i.e. it covers all of its own needs for electricity itself.

The share of eligible market in 2006 was 875 GWh, 100 per cent of it was sold by *Eesti Energia AS*. Relevant figures are presented in table 3.3.2 below. The right hand column contains the electricity quantity bought by eligible customers.

Table 3.3.2 Electricity consumption in Estonia

	Total consumption (without network losses) TWh	Sold to eligible customers on bilateral contracts TWh
2002	5 686	670
2003	6 013	760
2004	6 326	880
2005	6 403	850
2006	6 902	875

According to the organisation of closed market non-eligible customers may buy electricity only from the serving network operator or from seller designated by the operator. Network operators in turn shall purchase electricity for compensation of power losses or for re-selling to eligible customers produced either in Narva power plants, in cogeneration process or produced by small producers (below 10 MW

capacity). Essentially, the majority of Estonian producers comply with these criteria and are in equal conditions with the Narva plants. Therewith, electricity shall not necessarily be purchased directly from a power plant, as an important issue is the origin. This means that all sellers have possibility to purchase electricity from Narva plants and re-sell it. For example, *Eesti Energia AS* sale undertaking buys electricity from various power plants located in Estonia and re-sells it to other network operators. Other sellers may perform similarly.

Since there is no electricity exchange in Estonia and no electricity trade, there is no market price for electricity as well. In order to compare the Estonian market with other markets in EU countries the *AS Narva Elektriijaamad* (Narva Power Plants) production price has been taken as the market one – which is 40,95 EEK cents/kWh. Narva plants are the dominant producer (market share over 90%).

In conclusion it can be said that there is no effective electricity market in Estonia. However, there are very good possibilities for a Baltic electricity market, since unlike in other EU Member States there is enough transmission capacity available between the Baltic countries. Since 1st July 2007 the Latvian and Lithuanian markets are open in 100 per cent extent and since 1st January 2009 the Estonian market will open b 35 per cent (an estimated consumption level 2 500 GWh). In 2009 the Lithuanian Ignalina nuclear power plant will be closed and that will remarkable change the situation on the market. Through the Estonian/Finnish power cable to some extent also Finland can be considered part of the Baltic market. Moreover, since the power system of Baltic countries is connected with Russia, also Russian electricity acts on the market. As there is well developed electricity market in Finland along with the exchange price, it can be foreseen that prices in the Baltic market will be guided to some extent by the Finnish market price.

3.3.2 Retail market

The specific of retail market is also determined by the transitional period. Since non-eligible customers are obliged to buy electricity from the servicing network operator they have no possibility to change the supplier. As electricity trade is essentially missing, the electricity consumed by eligible customers can also be deemed retail one. In the retail market the undertaking with the biggest share is *Eesti Energia AS*. Its market share is about 88 per cent.

The information related to retail market is presented in table 3.3.3 below.

Table 3.3.3 General retail market information

	Total consumption GWh	No of undertakings with more than 5% market share	No of independent electricity sellers	Market share of three biggest sellers			Change of seller		
				Large and very large industries	Medium and small industries	Small undertakings and household customers	Large and very large industries	Medium and small industries	Small undertakings and household customers
2001	5 607	1	0	100	93	93	0	0	0
2002	5 686	1	0	100	93	93	0	0	0

2003	6 013	1	0	100	93	93	1	0	0
2004	6 326	1	0	100	93	93	1	0	0
2005	6 403	1	0	100	93	93	1	0	0
2006	6 902	1	3	100	92	92	1	0	0

The data on formation of the prices paid by final customers (network services + electricity) are presented in the following table.

Table 3.3.4 Electricity final consumer prices in 2006

Prices €/MWh (Estonian cent/kWh)	Large industrial customer	Commercial customer	Household customer
Network service (without taxes) ¹	13,32 (20,85)	29,00 (45,39)	39,21 (61,36)
Taxes as part of network charge	0,00	0,00	0,00
Electricity	23,79 (37,23)	27,52 (43,07)	28,99 (45,37)
VAT 18%	6,68 (10,45)	10,17 (15,92)	12,28 (19,28)
Total (with taxes)	43,79 (68,53)	66,69 (104,37)	80,48 (125,95)

Notes:

According to Eurostat definitions:

- large industrial customer, one with an annual consumption of 24 GWh, max capacity 4000 kW
- commercial customer, one with an annual consumption of 50 000 kWh, max capacity 50 kW
- household customer, one with an annual consumption of 3 500 kWh.

Prices according to *Eesti Energia AS* and *OÜ Jaotusvõrk* price list

¹ the charge for network service includes the subsidy paid to renewable energy sources

1 €=15,65 EEK

3.3.3 Selling obligation and price regulation

General information about regulation of final customer price is presented in following table.

	Eligible customers	Medium size business customers	Small businesses and households
Regulated price (Yes/No)	No	Yes	Yes
Percentage share of customers buying electricity at regulated price	95	100	100
Possibility to switch back from market price to regulated price (Yes/No)	Yes	Yes	Yes
Electricity sellers with obligation to sell at regulated price	Network operator	Network operator	Network operator

As it was already described in subsections 3.3.1 and 3.3.2 until 2009 the market is opened only by about 10 per cent and the electricity sold to non-eligible customers shall be produced either in Narva power plants, in cogeneration process or produced

by small producers (with a capacity below 10 MW). Both *AS Narva Elektriijaamad* and *OÜ Iru Elektriijaam* (Iru Power Plant Ltd.) belong to *Eesti Energia AS* group, while the market share of *AS Narva Elektriijaamad* in production is 95 per cent. *AS Narva Elektriijaamad* uses oil shale fuel mined in Estonia. Oil shale is mined by *AS Eesti Põlevkivi*, which has a market dominant position and belongs to *Eesti Energia AS* group. According to the Electricity Market Act the EMI shall approve prices for the following:

- the price for oil shale, which is an important input in formation of production cost of *AS Narva Elektriijaamad*
- the production price for *AS Narva Elektriijaamad*, which is an important input in the formation of the tariffs for electricity sold to non-eligible customers
- the tariffs of electricity sold to non-eligible customers under selling obligation.

In addition to price/tariff approval the Electricity Market Act also stipulates selling obligation according to which network operators are obliged to sell electricity to all non-eligible customers connected to their network. If eligible customers connected to the network of a network operator have no economically competitive possibility to purchase electricity from another seller, they also have the right to purchase electricity at a price for non-eligible customers in the framework of the selling obligation. Network operators have obligation to perform the selling obligation themselves or, they have also the right to designate another seller to perform the selling obligation. For example, *OÜ Jaotusvõrk*, the distribution network operator belonging to *Eesti Energia AS* group, has designated *Eesti Energia AS*, as the seller of electricity.

Both the principles of approval of prices for oil shale, for production and sale by *AS Narva Elektriijaamad* are similar to those of the network services. The price is formed of justified costs, capital expenditure (depreciation of fixed assets) and justified return. In the evaluation of justified costs the EMI considers technical efficiency indicators, cost saving principles and monitors whether cross-subsidising is avoided. The main difference compared to the regulation of network operators is that in production and sale price regulation there is no regulation period and the regulatory authority monitors prices upon undertaking's application, while network charges are approved for a certain fixed period and is indexed by changes of consumer price index (RPI-x regulation). The general principles of price approval were described in detail in sub-section 3.2 "Regulation of electricity networks".

Regarding sale price the EMI approves weighted average limit price and an undertaking has the right to form different tariffs for different customer groups within this weighted average limit. The above described regulation leaves a flexible possibility for undertakings for formation of different prices within the weighted average. According to the Electricity Market Act the EMI has elaborated and disclosed unified methodology for calculation of a justified weighted average price limit for performing of selling obligation. The methodology determines the tariff period, which is one year. If during the tariff period the actual price appeared higher than the EMI approved weighted average price limit, it shall be compensated for to customers during the next price period. This means the next period tariff shall be decreased. If the actual price appeared lower than the EMI approved weighted average price limit, it is considered as an undertaking's risk and shall not be compensated for by customers.

For *AS Eesti Põlevkivi* (oil shale mining industry) the approved price limit is 133 kroons (EEK) per ton. It has been approved already in 1998, i.e. the company has succeeded to sell at the same price for almost ten years. It can be stated that *AS Eesti Põlevkivi* has performed effectively from an economic point of view, i.e. their cost has been under control. A circumstance that facilitated to achieving that goal has been the good oil price in the world market, which increased oil shale mining for the purpose of shale oil production.

For *AS Narva Elektriijaamad* the EMI approved price in 2004. Their price consists of two components: a variable part, which is 24,17 EEK cents per kWh and the capacity charge of 784 637 EEK kroons per MW per year. Since it is two-component price, then a weighted average first of all depends on the quantity of sold electricity and in 2004 it resulted in the level of 40,95 EEK cents per kWh.

In November 2004 the EMI approved for the largest sale undertaking *Eesti Energia AS* a weighted average price limit for electrical energy of 41,83 EEK cent/kWh. Based on this limit the undertaking formed its detailed price list in 1st March 2005. In 1st March 2006 it applied a new price list, somewhat raising the prices for larger customers, while leaving smaller customer (incl. also households) prices unchanged. In 1st May 2006 those were presented to the EMI data, including the method of computation. It appeared that the actual weighted average price in the period from 1st March 2005 to 28th February 2006 was lower than the approved limit. Thus the undertaking sold below accepted limit and that was the reason for raising tariffs in the new period.

It can be said that both production and final consumer price regulations are cost-oriented price regulations. The price reflects coverage of justified operational cost, reasonable return (profit) on invested capital. The investments made into new capacity are also included in the price. *AS Narva Elektriijaamad* is planning to invest into erection of 600 MW electrical capacity. It is obvious that investment cost will be included in the price of electricity and that will bring an unavoidable consumer tariff increase. Thus, the current price regulation prevents from a situation of selling electricity below production cost. For example, for *AS Narva Elektriijaamad*, as the producer in a market dominant position, a return on invested capital of 8,5 per cent is accepted. Such level should be deemed justified, considering its market dominant position.

Since market in Estonia is opened only by 10 per cent and is extremely concentrated (*Eesti Energia AS* controls practically the entire wholesale market with close to 100% market share), the eligible customers essentially have no possibility to choose alternative suppliers. That is why the EMI is in a position that regulation of both production and sale price is necessary and justified in order to protect customers and avoid earning of unjustified high profits by market dominating undertakings. Without production and sale price regulation the undertakings may form their sale prices on a level of neighbouring markets and thereby earn unjustified high profits on invested capital. Stipulations of the Electricity Market Act prevent from situations of possible market distortions, like selling to eligible customers at a higher price than to non-eligible customers.

The Electricity Market Act prevents also from occurrence of a situation in which in case of sharp rise of production cost it is impossible to transfer it to final customers. In case of rapid changes in electricity market and if the approved weighted average price limit does not cover all costs the company may, at its own initiative, apply prices exceeding the limit and after that submit a new weighted average price limit for approval to the EMI. If the price appears not justified, the undertaking shall compensate for the difference to customers.

3.4 Competition supervision

In Estonia the authority responsible for competition supervision is first of all the Competition Board. The Competition Act provides definitions for undertakings with a market dominant position, undertakings having special and exclusive rights and undertakings possessing and controlling essential facility. An undertaking, or several undertakings operating on the same goods market, has a dominant position if the position enables it/them to operate in the market to an appreciable extent independently from competitors, suppliers and buyers. Dominant position is presumed if an undertaking or several undertakings operating on the same market account for at least 40 per cent of the turnover in the goods market.

According to the Competition Act any direct or indirect abuse by an undertaking or several undertakings of the dominant position in the goods market is prohibited, including:

- 1) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions
- 2) limiting production, service, goods markets, technical development or investment
- 3) offering or applying dissimilar conditions to equivalent agreements with other trading parties, thereby placing some of them at a competitive disadvantage
- 4) making entry into an agreement subject to acceptance by the other parties of supplementary obligations which have no connection with the subject of such agreement
- 5) forcing an undertaking to concentrate, enter into an agreement, which restricts competition, engage in concerted practices or adopt a decision together with the undertaking or another undertaking
- 6) unjustified refusal to sell or buy goods.

Special or exclusive rights are deemed the rights granted to an undertaking by the state or a local government, which enable the undertaking to have a competitive advantage over other undertakings in a goods market or to be the only undertaking in the market. An undertaking is deemed to control essential facilities or to have a natural monopoly if it owns, possesses or operates a network, infrastructure or any other essential facility which other persons cannot duplicate or for whom it is economically inexpedient to duplicate but without access to which or the existence of which it is impossible to operate in the goods market.

The Competition Act stipulates obligations of undertakings with special or exclusive rights or in control of essential facilities according to which above mentioned undertakings shall:

- 1) permit other undertakings to gain access to the network, infrastructure or other essential facility under reasonable and non-discriminatory conditions for the purposes of the supply or sale of goods;
- 2) keep clear separation of accounts for different primary and secondary activities (e.g. production, transmission, marketing and other areas of activity) enabling thereby transparency of economic performance;
- 3) maintain separate records on revenue and expenditure related to each product or service on the basis of consistently applied and objectively justified principles of calculation, which shall be clearly specified in the internal rules of the undertaking. The calculation of revenue and expenses must enable to assess whether the price of a product or service is in a reasonable ratio with the value of the product or service.

An undertaking with special or exclusive rights or in control of an essential facility may refuse to grant other undertakings access to the network, infrastructure or other essential facility if the refusal is based on objective reasons, including cases where:

- 1) the safety and security of the equipment connected with the network, infrastructure or other essential facility or the efficiency and security of the operation of such network, infrastructure or facility are endangered;
- 2) maintenance of the integrity or the inter-operability of the network, infrastructure or other essential facility is endangered;
- 3) equipment to be connected to the network, infrastructure or other essential facility is not in conformity with the established technical standards or rules;
- 4) the undertaking applying for access lacks the technical and financial capability and resources to provide services efficiently and safely to the necessary extent through or with the assistance of the network, infrastructure or other essential facility;
- 5) the undertaking applying for access does not hold the permit prescribed by law for the corresponding activity;
- 6) as a result of such access, data protection provided by law is no longer ensured.

On the basis of the Act all network operators are undertakings with special and exclusive rights, as well as the undertakings possessing essential facility. The exclusive right is granted also by the concession principle, as described in section 3.2 above, by which to every distribution network has service area assigned to it and in which only one operator may provide network services. The Electricity Market Act regulates the activities of network operators in detail and assigns the supervisory function to the EMI. This does not prevent the Competition Board from its right of supervising of network operator's performance. In practice primarily the EMI supervises and controls the activities of network operators.

Eesti Energia AS has a market dominant position both as a producer and as a seller. On the basis of the Electricity Market Act the EMI is obliged to approve the price of electricity sold to non-eligible customers and in the framework of this also the production price of Narva power plants. The EMI has also the right to monitor the prices of a market dominant seller and of the electricity sold by producer.

Besides the EMI also the Competition Board supervises the activities of *Eesti Energia AS* and other producers and sellers. The EMI has entered into corresponding contract agreement with the Competition Board.

Conclusively, the situation on the Estonian electricity market is determined by the circumstance that due to the transitional period, given as an exemption in the fulfilment of the EU internal electricity market directive, the market is opened only by 10 per cent. That is why essentially there is no market. There is no competition also in connection with the sale of electricity to eligible customers. Another feature of the market is an extreme concentration. *Eesti Energia AS* share in the wholesale market is close to 100 per cent and in the retail market 88 per cent. The next largest *Fortum Elekter AS* and *VKG Elektrivõrgud OÜ* have shares respectively 3 and 2,5 per cent. Considering high concentration it is not very realistic to expect competition even after 2009, when 35 per cent of the market shall be opened. Better chances for competition would be provided by a common market of the three Baltic countries. It is a unique situation in the entire EU, as there are no limitations for cross-border transmission capacity. Another circumstance that shall facilitate competition in the entire Baltic region is the Estonian-Finnish sea cable that started commercial operation in the end of 2006.

3.5 Obligations of market participants and customer protection

3.5.1 General obligations of market participants

The obligations of market participants are stipulated in the Electricity Market Act. In addition to law stipulations the EMI issues an activity licence with conditions set forth in it. An activity licence is required in order to:

- 1) terminate the exploitation of a generating installation with a net capacity of over 1 MW;
- 2) generate electricity, except for generation by one producer using generating installations having a total net capacity of less than 100 kW;
- 3) provide network services through a distribution network;
- 4) provide network services through the transmission network;
- 5) transmit electricity through a direct current line crossing the state border;
- 6) transmit electricity through a direct line;
- 7) sell electricity;
- 8) import electricity, except for the import of electricity by the system operator.

An activity licence together with conditions thereon is issued by the EMI. After issuing the licence the EMI may change the conditions or validate new conditions if this becomes necessary due to amendments of legislation, for maintaining of security of supply or in order to ensure fulfilment of obligations in compliance with the Electricity Market Act or other legal acts.

Most thoroughly the Electricity Market Act regulates activities of network operators, with their main obligations stipulated as follows. A network operator shall provide the following network services to the customers, producers, line possessors or any other network operators within its service area:

- 1) on the basis of a corresponding request, connect any electrical installation conforming to the requirements and located in its service area to the network at the connection point;
- 2) on the basis of a corresponding request, amend the consumption or generation conditions;
- 3) enable a network connection to be used at the connection point;
- 4) transmit electricity through its network to the connection point or from the connection point;
- 5) ensure the installation of a metering device conforming to the requirements of legislation to determine the amounts of electricity transmitted through its network;
- 6) ensure the collection and processing of measurement data;
- 7) provide extra services directly related to the network services.

A network operator shall observe the principle of equal treatment of market participants when providing network services. A network operator has the right to refuse to provide network services if:

- 1) the electrical installations of the user of network services do not conform to the requirements of legislation or to the technical conditions established by the network operator for connection to the network;
- 2) the provision of network services is not possible for any other reason dependent on the user of network services;
- 3) the provision of network services is not possible for reasons independent of the network operator;
- 4) the network of the network operator lacks the necessary transmission capacity for provision of network services.

A network operator shall provide the reasons for any refusal to provide network services. In the reasoning, the legal basis for refusal shall be indicated and the EMI shall be notified of refusal to provide network services. A network operator shall develop the network within its service area such that the continued provision of network services is ensured to all customers, producers, line possessors and any other network operators connected to the network, in accordance with their justified needs, legislation and conditions of the activity licence.

In essence the described regulation ensures provision of network services to all market participants and third party free access to the network. Possibilities of refusal to provide network services are extremely limited and in practice no cases of refusal has been recorded.

Compared to network operators the Electricity Market Act sets much less obligations to producers of electricity. According to the Act the generating installations of producers shall conform to the technical requirements established by the grid code. Producers' actions shall comply with orders issued by the system operator. A producer shall notify the system operator promptly of any dangerous situations, accidents or other circumstances that endanger or could endanger security of supply or the performance of any contractual obligations.

In addition to law the EMI has set forth an obligation to the market dominant producer *AS Narva Elektriijaamad* (Narva Power Plants Ltd.) to secure uninterrupted

supply of electrical energy to customers. Since *AS Narva Elektriijaamad* and *OÜ Iru Elektriijaam* (Iru Power Plant Ltd.) are extremely important for securing of district heat supply to Narva and Tallinn city respectively, the EMI has set forth in their activity licences an obligation of an uninterrupted supply of heat to the cities.

An electricity selling licence is required for both the network operators that sell electricity to the customers connected to their network and for undertakings performing electricity sale.

3.5.2 Rights and obligations of the Inspectorate

From a supervisory authority point of view the Estonian legislative basis can be considered as a solid one and gives for the EMI enough possibilities for market regulation.

The EMI has the right to get necessary information from a market participant and from state and local municipal authorities, right to enter their territory, rooms and facilities for the purpose of on-site inspection, examine the documents necessary for supervisory activities and other information and circumstances and make extract, transcripts and copies thereof. The EMI can also inspect the accounts and prices practices applied by market dominant producers or sellers, establish development obligations for undertakings through licence conditions. For example, it can impose an obligation to invest for network operators that have not secured stable electricity supply for customers in accordance with requirements.

At the same time the EMI is obliged to supervise fulfilment of the Electricity Market Act and to make precepts in case of violation. Also, market participants (consumers or undertakings) can record complaints on activities or inactivity of other market participants and the Inspectorate has to re-settle them by its decisions. Both the precepts and decisions are administrative acts that can be challenged with an administrative court, which has the right to invalidate an EMI's decision or a precept.

The Electricity Market Act also stipulates that in case of certain violations of law the Inspectorate has the right to initiate misdemeanour proceedings. The following violations of law are determined as misdemeanours:

- 1) violation of the obligation (failure) to provide network services;
- 2) violation of the quality requirements for provision of network services;
- 3) sale of electricity at a price which is not approved or which is higher than the approved price;
- 4) violation of the rules of cross-border electricity trade;
- 5) failure to submit information.

The penalties that can be imposed in case of violation of the position 1) is up to 20 000 kroons (EEK), in other cases of up 50 000 kroons.

3.5.3 Customer information

Network operators are obliged to maintain a web site and disclose on it the following information:

- 1) principles of formation of the fees for connecting to the network;
- 2) data reflecting efficiency, quality and profitability of the network operations;
- 3) data on the sale enterprise in case the network operator has designated another undertaking to execute the selling obligation;
- 4) charges for network services;
- 5) standard terms and conditions of customer contracts for provision of network services.

Sellers of electricity have to disclose on their web site:

- 1) tariffs for the electricity sold within the framework of the selling obligation (to non-eligible customers);
- 2) standard terms and conditions for electricity sale;
- 3) data about environmental impact during previous reporting year: CO₂ and SO₂ emissions, disposed oil shale ash and radioactive waste caused in production of the sold electricity.

The network charges and the tariff for electricity sold in the framework of the selling obligation shall be published at least ninety days prior to their entry into force. In addition to web site the tariffs have to be disclosed also in at least one daily national newspaper. The standard terms and conditions for provision of network services and for the selling of electricity shall be disclosed at least thirty days before becoming valid.

If a network operator sells both network service and electrical energy, it is obliged to separate on customer bills the prices. All sellers of energy are obliged to inform customers about the distribution of energy sources used in production. Respective information shall be attached to the customer bill.

In conclusion the EMI is in a position that the customer information in the electricity sector is quite well regulated. The customer pre-information time about price/tariff changes is sufficient and most network operators have good web sites from which their customers can get enough information about network services and electricity sale as well.

3.5.4 Customer contracts, supply limitations and interruptions, extra-judicial proceedings

As regards customer contracts the EMI is in a position that it is a well regulated field and customer interests are enough protected. According to the Electricity Market Act standard terms and conditions of contacts for provision of network services, for electricity sale to non-eligible customers under the selling obligation and connection to network shall be approved by the EMI. In approval of above mentioned standard contract conditions the EMI follows the principle of proportionality, aiming balance

of rights and obligations of both undertakings and customers. An important criterion in approval of standard terms and conditions is also their compliance with the Law of Obligations Act.

The contract entered into with customers for provision of network services may be both with a specified term or termless. As rule, termless contracts are entered into. Both network operators and sellers of electricity may change conditions of contract only if there is an objective reason for that in order to take into account changes of circumstances and only if the EMI has granted approval to a change of standard conditions.

Interruption of network connection is regulated very detailed and the EMI is in a position that the protection of socially vulnerable customers in possible case of failure to pay in time is sufficient. A network operator may interrupt the connection of a customer to the network if the customer has failed to pay the amount payable on the basis of the contract entered into with the network operator or seller or, has in another manner materially breached an obligation arising from the contract. Before interruption of a network connection a notice concerning the planned interruption of the network connection shall be sent to the customer. The notice shall set out the grounds for interrupting the network connection and the planned time of the interruption. The network connection of a customer may be interrupted after at least fifteen days have passed since the notice was sent and if, during that period, the customer has failed to eliminate the circumstances which were the grounds for interruption of the network connection and has not notified the network operator or seller, as appropriate, thereof.

If a network connection is interrupted on the grounds that a customer who is a natural person has failed to pay an amount payable according to the contract due to the temporary insolvency of the customer as a result of his or her serious illness or unemployment, the customer may notify the network operator or seller thereof in writing. Evidence of those circumstances shall be annexed to the notice. On receiving the notice and evidence, a network operator may interrupt the network connection of a customer who is a natural person after at least thirty days have passed since the notice was sent and if, during that period, the customer has failed to eliminate the circumstances which were the grounds for interruption of the network connection and has not notified the network operator or seller, as appropriate, thereof.

If a network connection is interrupted on the grounds that the amount payable has not been paid, the connection may be interrupted during the period from 1st October to 30th April in a building or a part thereof which is residential space, used as a permanent residence and heated in full or primarily by electricity only when at least ninety days have passed since the notice and if, during that period, the customer fails to remove the circumstances which were the grounds for the interruption and has not notified the network operator or seller, as appropriate, thereof. A network operator may limit the capacity of the network connection of a customer. The customer shall be notified of such limitation at least fifteen days in advance.

A network operator may promptly interrupt the network connection of a customer if the customer increases, without authorisation, the limited capacity, uses electricity or without authorisation (steals electricity), uses electrical installations which do not

meet technical requirements, are dangerous or interfere with the operation of the network as a whole or prejudice security of supply.

Possible cancellation of both network contract and electricity sale contract is precisely regulated by the Electricity Market Act. A network operator may cancel a network contract and disconnect the place of consumption from the network if: the network connection has been interrupted by the network operator due to a breach of the network contract and the interruption has lasted for at least 180 consecutive days and the customer has failed, during that period, to eliminate the circumstances which were the grounds for the interruption or commence the consumption of electricity; and the customer has materially breached obligations arising from the network contract and the breach has not been remedied within a reasonable period of time granted by the network operator meaning that, as a result, the network operator cannot reasonably be expected to continue executing the contract.

A network operator shall give notice of the cancellation of a network contract at least thirty days in advance. The notice shall set out the grounds for cancellation and the date of termination of the contract.

A seller or a network operator has the right to cancel an electricity contract if: the customer has materially breached obligations arising from the contract and has not remedied the breach within a reasonable period of time granted by the seller or network operator; the network connection through which electricity was sold on the basis of the electricity contract has been interrupted on the grounds that the customer has failed to pay the amount payable; the customer has materially breached an obligation arising from the contract in another manner and the interruption has lasted for at least sixty days; the customer has used electricity or network services without authorisation or has intentionally or due to gross negligence caused damage to the property of the network operator or the seals or verification marks placed on the metering devices by the network operator or the seller. A customer shall be notified of the cancellation of an electricity contract at least thirty days in advance. The notice shall indicate the grounds for cancellation of the contract and the date of contract termination.

All market participants, both undertakings and customers have the right to refer to the EMI as to an extra-judicial body. A market participant may record a written complaint with the EMI against the action or omission of another market participant that is in conflict with the Electricity Market Act or legislation established on the basis thereof. The EMI reviews the complaint and makes a decision thereon within thirty days as of the receipt of the complaint. If the EMI requests information necessary for resolving the complaint, the passage of the term shall be suspended, but not for longer than sixty days. The EMI's decisions can be challenged with an administrative court in 30 days since receiving of a decision.

Conclusively, the EMI is in a position that electricity customers are quite well protected. The tariff for electricity sold to non-eligible customers is regulated, the costs forming it is under control of the regulatory authority and for undertakings justified return on invested capital is ensured. If eligible customers fail to purchase electricity at a more favourable price they have the right to buy at the price regulated in the framework of the selling obligation. The currently enforced regulation of market dominant producer and seller is necessary in the situation of gradual market

opening and to-days opening level of 10 per cent. Without regulation a situation is likely to arise in which both producers and sellers attempt earning unjustified high profit.

Sufficient information is available to customers about the formation of prices, standard terms and conditions of contracts, energy sources used for production, etc. Most network operators have well shaped web sites that contain sufficient information. The standard terms and conditions of contracts for provision of network services and sale of electricity are to be approved by the EMI and possible interruption of network connection or cancelling of sale contracts are very detailed regulated by law.

4. Gas market

4.1 Review of gas market and its regulation

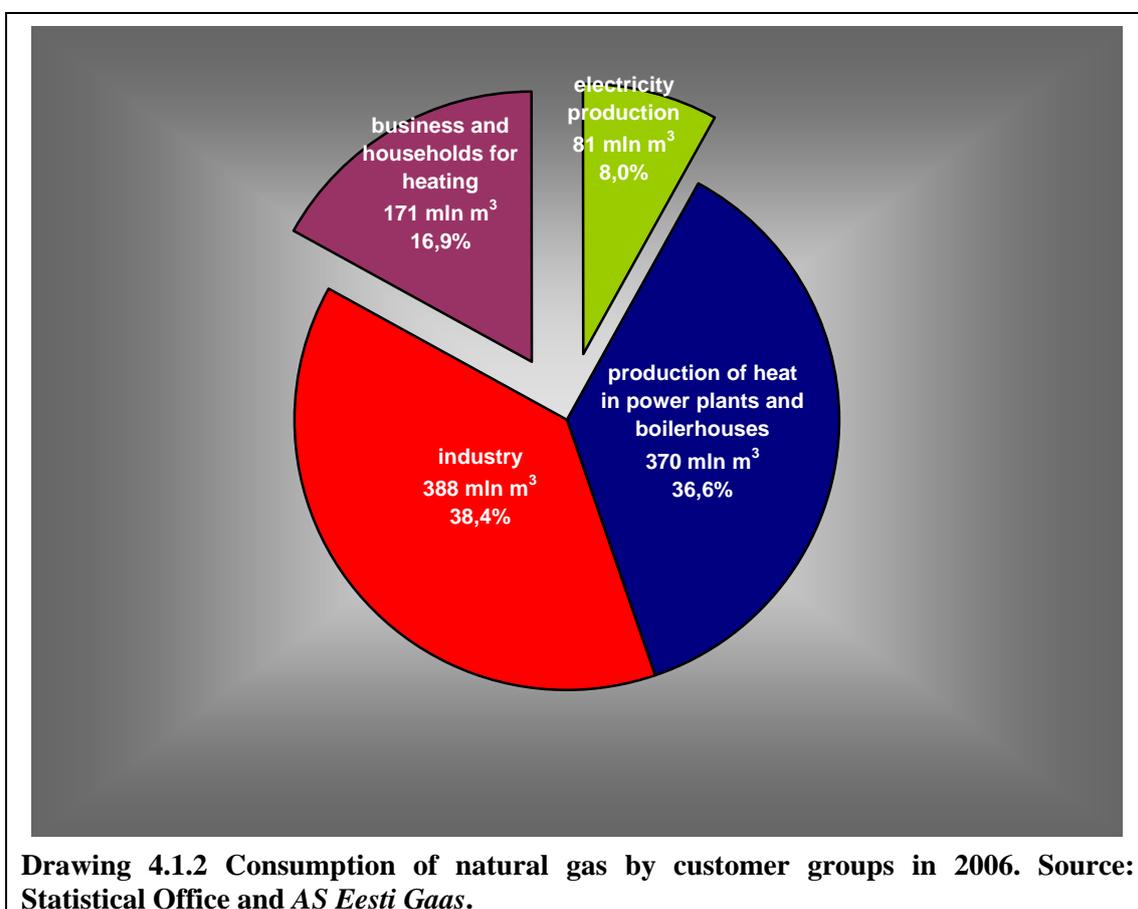
Similarly to electricity system also the gas supply system was built during the former Soviet Union and historically formed part of the Soviet gas supply system. Map of the Estonian gas supply system is presented in drawing 4.1.1 below.

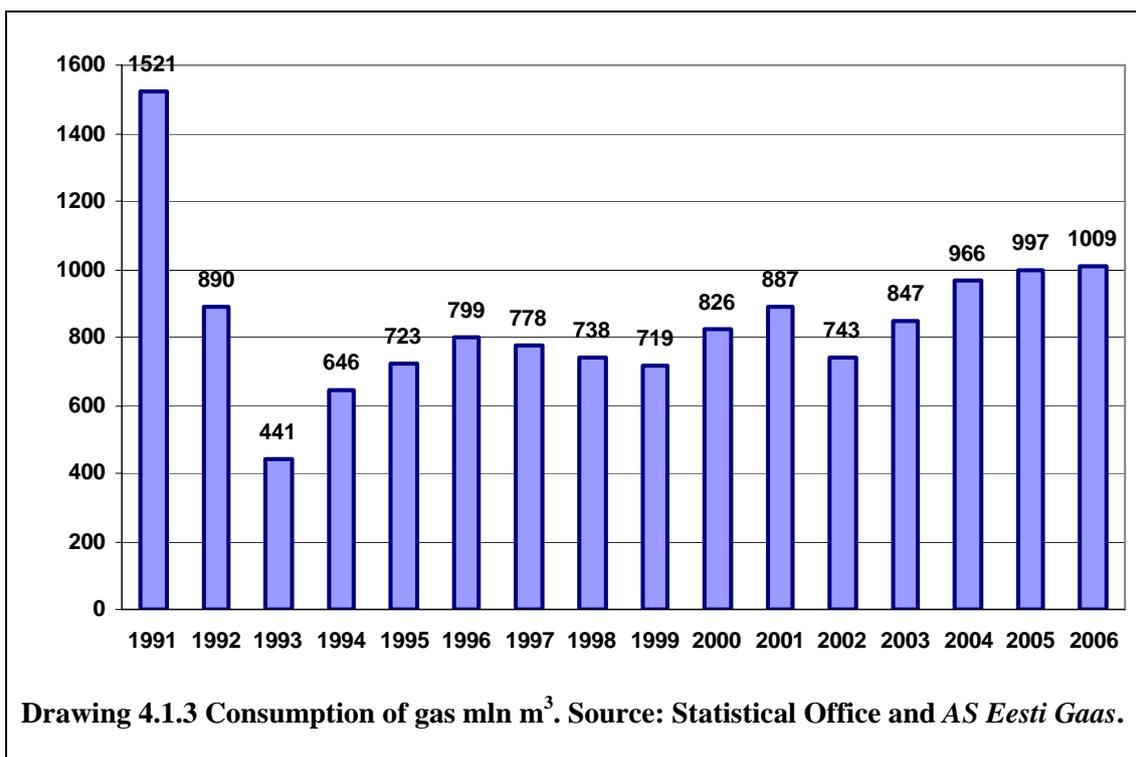


Drawing 4.1.1 Natural gas network in Estonia

Estonia has cross-border connections only with Russia and Latvia, and that is why Estonia is in a similar position with other Baltic countries and Finland. There are no connections with other Member States and the only source of supply is Russia.

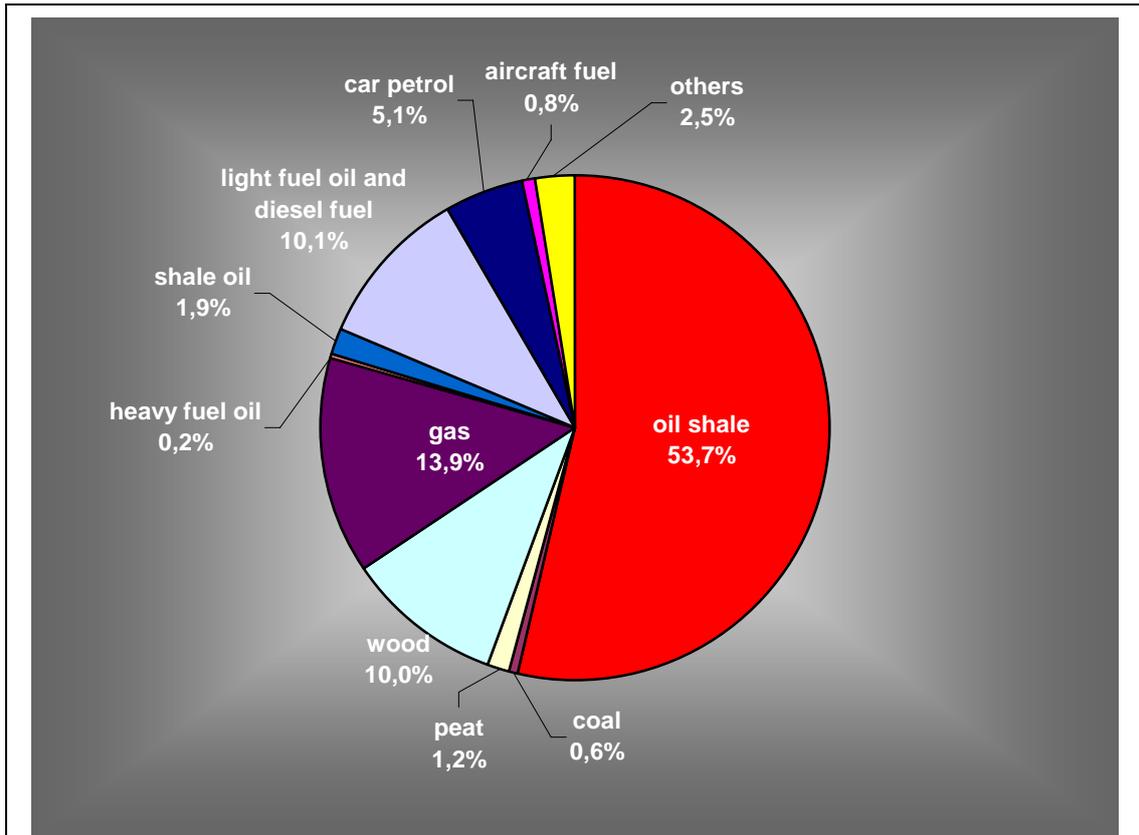
In 2006 the consumption totalled 1 009 million m³. 81 million out of it was used for electricity generation, 370 mln for heat production in power plants and boiler houses, 171 mln by household and business customers primarily for heating and 388 mln m³ for industrial purpose. Thus, a specific in Estonia is that large share of gas is used for industrial and heating purpose and the share used for electricity production is low. Consumption of gas by different customer groups is presented in below diagram 4.1.2. Since 2000 the consumption of gas has moderately increased and in 2006 it exceeded 1 000 mln m³ milestone (see diagram 4.1.3).





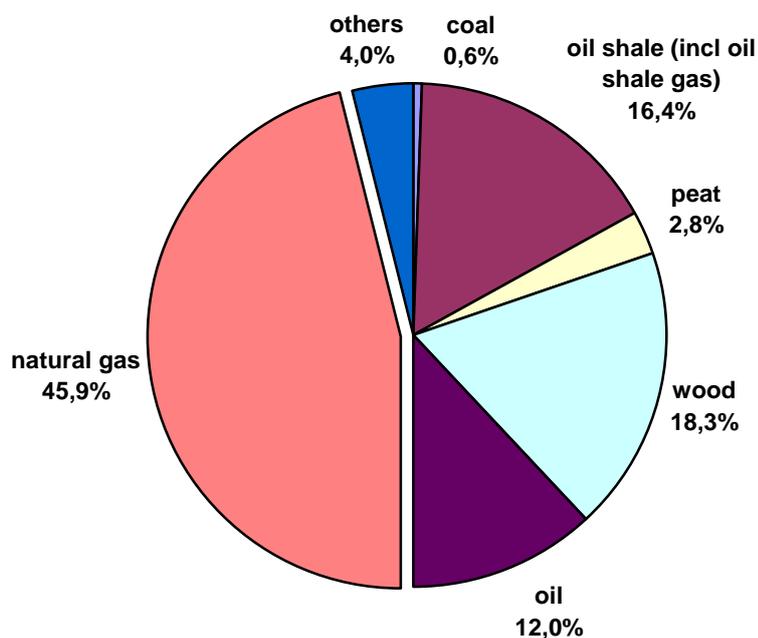
According to a prognosis of *AS Eesti Gaas* in the next ten years the consumption of gas will increase by 25 per cent, of up 1 250 mln m³ by year 2015. Whereas already today almost 20 per cent of the consumption is the quantity consumed by *AS Nitrofert*, the producer of fertilisers. Thus, this consumer to a large extent determines consumption of gas in Estonia. The electricity sector development plan also foresees an increase of gas consumption for electricity production by 4 times or, up to 23 per cent instead of the current 5,3 per cent. The EMI's evaluation is that such share of gas is unrealistic, first of all from the point of view of security of supply. Also, *AS Eesti Gaas* itself expects an increase first of all at the share of the gas used for heating. The energy conservation programme prepared by the government foresees a potential for energy saving in the heating sector by 20 to 30 per cent. Considering that it can be anticipated that the 25 per cent increase is rather over than under forecasted.

The share of natural gas is 13,9 per cent (drawing 4.1.4), so the share is not very large and as mentioned before, first of all gas is used for heating purpose. Therewith the share of gas in electricity generation is only 5,3 per cent, but in heat production even as high as 45,9 per cent (see drawing 4.1.5).



Drawing 4.1.4 Estonian primary energy balance in 2005. Source: Estonian Energy in Figures, the Ministry of Economic Affairs and Communications 2007

Besides above the Estonian gas supply is also characterised by the circumstance that in many areas like western part of Estonia including islands and central Estonia is without gas supply. To a large extent the reason is low population density of the territory. During the last years the network has expanded into Pärnu County and the town of Viljandi. In 2006 one of the biggest gas projects was the construction of gas supply network into Pärnu town. The next steps are the plans to develop the network into Põltsamaa and Paldiski. Through Paldiski also possible Estonian-Finnish gas connection would go, if undertaken. Thus, the decision on construction of the line and its dimensioning (pipeline diameter) depends upon the decision of the Estonian-Finnish connection. As perspective plans also gasification of Tõrva-Valga and Paide have been analysed. In addition to the development plans of *AS Eesti Gaas*, *Gaasienergia AS* is carrying out plans to construct a gas pipeline to Tamsalu.



Drawing 4.1.5 Fuels used for heat production. Source: Ministry of Economic Affairs and Communications, Estonian Energy in Figures 2007

Similarly to the electricity system it should be emphasised that the transmission infrastructure is strong, there is no cross-border transmission capacity deficit between Baltic countries. At the same time a specific is total dependence on supplies from Russia.

The formation of an Estonian gas market dates back to 1998 when the Energy Act entered into force, by which all customers except households were determined as eligible ones. In 1st July 2003 the Natural Gas Act entered into force. It determines eligible customers as ones with an annual consumption over 200 thousand m³, but this has no impact on the share of open market. In December 2005 an amendment was made to the Act, which stipulates that until 1st July 2007 all customers except households are eligible ones and from this date all customers are eligible. Table 4.1.1 presents the dynamics of the gas market opening.

Table 4.1.1 Gas market opening

Year	Annual consumption GWh	Percentage of market opening
1998	All, excl. households	95
1999	All, excl. households	95
2000	All, excl. households	95
2001	All, excl. households	95
2002	All, excl. households	95
2003	1,8	95
2004	1,8	95

2005	1,8	95
2006	All, excl. households	95
2007 ¹	All customers	100

Note: ¹ since 01.07.2007

4.1.1 Cross-border connections, availability and distribution of capacity reserves

Estonia has network connections with Russia and Latvia. Altogether there are three connections: from Narva and Värskas to Russia and from Karksi to Latvia (drawing 4.1.1) with the total capacity of 11 000 thousand m³ daily. As a rule, only the Värskas and Karksi connections are operational. The Narva connection is typically closed because of limitations in the Russian side network. The pass-through capacities of particular connections are the following:

Karksi connection with Latvia 7000 thousand m³ daily

Värskas connection with Russia 4000 thousand m³ daily

Narva connection with Russia, with a theoretical pass-through capacity of 4000 thousand m³ daily, the actual pass-through capacity is not more than 500 thousand m³ daily

Because of very cold weather conditions in 19th January 2006 the consumption reached its last years peak of 6700 m³ daily, yet it did not exceed the pass-through capacity, which is 11 000 m³ daily. The peak load of 2007 was 6350 thousand m³ daily. Natural gas annual peak consumptions are presented in table 4.1.2.

Table 4.1.2 Natural gas peak consumption and pass-through capacity of transmission system

Year	Consumption peak		Pass-through capacity of transmission system	
	1 000 m ³ daily	MW	1 000 m ³ daily	MW
2001	5 400	2 099	11 000	4 276
2002	5 000	1 944	11 000	4 276
2003	5 500	2 138	11 000	4 276
2004	5 100	1 983	11 000	4 276
2005	5 200	2 022	11 000	4 276
2006	6 700	2 605	11 000	4 276
2007 ¹	6 350	2 469	11 000	4 267
2008 prog	6 700	2 605	11 000	4 276
2009 prog	6 850	2 663	11 200	4 354
2010 prog	7 000	2 721	11 400	4 432
2011 prog	7 150	2 780	11 600	4 510
2012 prog	7 300	2 838	11 800	4 587
2013 prog	7 400	2 877	11 900	4 626
2014 prog	7 500	2 916	12 000	4 665
2015 prog	7 600	2 955	12 100	4 704

Note: ¹ the 2007 data are for the first free months of the year

Therefore, there is no lack of pass-through capacity. According to a prognosis of the system operator *AS EG Võrguteenus* there shall be no capacity deficiency until 2015. That is why the regulatory authority has no need for capacity distribution. After 2012 the pass-through capacity may increase because of reconstruction of the Russian side network in Narva direction. Even today the technical capacity is 4 000 m³ daily (1 555 MW), but it cannot be utilised because of some network limitations on the Russian side. In addition *AS EG Võrguteenus* plans to gradually increase the pass-through capacity that first of all will be achieved by reconstruction of gas distribution stations.

In conclusion: the Estonian gas transmission system today has sufficient pass-through capacity and until 2015 there will be no capacity deficiency. Moreover, the Estonian side pass-through capacity is 15 000 m³ daily, but it cannot be utilised because of network limitations on the Russian side in Narva direction. A precondition for capacity increase is investing into the Russian side network.

4.1.2 Price regulation of gas networks

Unlike electricity networks in issuing activity licences the so-called exclusive right principle is not applied for gas networks and according to the Natural Gas Act erection of parallel networks is allowed. In practice so far no case of construction of a parallel network has been recorded.

In issuing activity licences to distribution network operators the EMI determines the service area for an undertaking on map. Operator is obliged to develop the network in their service area in a manner that ensures gas supply to all already connected customers and to new connectees.

AS EG Võrguteenus possesses both the transmission network and the largest distribution network *AS EG Võrguteenus*. Its shares belong to *AS Eesti Gaas*, which is the largest undertaking in the Estonian gas market. Its major shareholders are Gazprom, Eon-Ruhrgas and Fortum. Together with *AS EG Võrguteenus* the total number of distribution network operators is 31. This is quite big number, considering the smallness of Estonia. The list of gas distribution operators is given on the EMI web site.

The market of distribution networks is also extremely concentrated. Thus, *AS EG Võrguteenus* has a market share of about 93 per cent and the number of its customers is 60 000. Other distribution operators have relatively little sale volume, typically of less than 10 000 thousand m³ annually and the number of customers below 1000. The market share of small distribution operators today is only 7 per cent. However, the development of small networks is rapid and in perspective their market share may increase up to 10 per cent. The main summary data of gas networks are presented in below table 4.1.3. The gas transmission service is provided only by *AS EG Võrguteenus*. The table also presents the company's distribution service tariffs. The tariffs of all undertakings are presented on the EMI web site. The tariffs of *AS EG Võrguteenus* are formed in respect of pressure level. The customers connected at the pressure from 0,1 to 16 bar pay for distribution service 211 and those connected

at a level below 0,1 bar pay 766 EEK kroons per 1000 m³. The customers connected at the higher pressure level are industries, smaller network operators and cogeneration (CHP) plants. Households are connected at the level below 0,1 bar, as a rule. Few larger customers (*AS Nitrofert, OÜ Iru Elektriijaam*) and network operators are connected to the *AS EG Võrguteenus* transmission network at a pressure of above 16 bars. Smaller network operators have established a single distribution tariff for all customers, as a rule, irrespective of the pressure level and other characteristics of consumption like volume. The tariffs range between 0,4 and 0,97 EEK kroons per 1000 m³.

Table 4.1.3 Summary of gas network operators

	No of regulated undertakings	Tariff for network service €/MWh (EEK/thousand m ³)		
		Large industry (I4)	Commercial (I1)	Household (D3)
Transmission	1	0,604 (87)		
Distribution	31	1,465 (211)	1,465 (211)	5,320 (766)

Notes:

According to Eurostat definitions:

- large industrial customer (I4) with an annual consumption of 116 300 MWh or 12 600 thou m³
- commercial customer (I1) one with an annual consumption of 116,3 MWh or 12,6 thou m³
- household customer (D3) one with an annual consumption of 23 260 kWh or 2,53 thou m³

Prices of network services according to *AS EG Võrguteenus* service price list.

Since the unit for network service prices is thousand m³, then in brackets also prices in EEK/thou m³; calorific heat value of gas is 9,2 MWh/thou m³

1 € = 15,65 EEK

According to law price regulation is uniformly applied to all network operators regardless of their size. This adds significant amount of work to the EMI, as first of all the volume of work depends on the number undertakings and not on the size of market. Saying in other words, the amount of work is more or less the same, irrespective of whether a large or a small undertaking is concerned.

The only exemption in regulation of gas network operators is the requirement for the legal unbundling of network activities. According to the Natural Gas Act legal unbundling is required when the number of customers is over 100 000 or, the same undertaking performs both transmission and distribution activities. Due to that the undertaking with legal unbundling from *AS Eesti Gaas* is its distribution operator. Since 2006 a separate undertaking *AS EG Võrguteenus* was founded. For other undertakings law stipulates requirement for separation of accounts. Since *AS EG Võrguteenus* performs both transmission and distribution activities and therefore, a separation of accounts for both services is required.

According to law the EMI approves separately the following network services and methodologies:

- transmission service
- distribution service
- methodology of calculation of the fee for connecting to the network.

The price for balancing gas and the charge for gas transit are not approved. For these prices the EMI applies *ex-post* regulation, i.e. supervision/monitoring of the price.

The principles of regulation of gas network operators are the same applied in electricity networks regulation. The EMI elaborates a unified methodology for calculation of network service prices that forms the basis for both the transmission and distribution service regulation and price approval. The methodology is disclosed on the EMI web site. The site also includes specially elaborated tables for collection of input data to be filled in for approval process. The tables are relatively comprehensive and include technical data and detailed accounts: profit and loss statement, balance sheet, and data about assets. Undertakings shall also submit a detailed investment plan and separately the expected sale volumes of network services. Since the tables are comprehensive, it is required to fill them in only for price approval purpose. Regular updating of the tables is not required, but the EMI is entitled to request additional information about economic performance and technical indicators and in case of necessity require filling in the tables disclosed on the web site. At the same time undertakings are obliged to separate in their annual accounts network services and sale of gas. The annual accounts are public documents that can be got acquainted by all interested parties.

Submission of input data is an obligation stipulated by law. The EMI can request any information needed for price approval and executing of supervisory proceedings. The EMI employees can also visit enterprises any time and request data and copies of documents. The practice so far has shown that undertakings do not refuse submitting information and the established procedures for data acquisition work problemless.

In the regulation of network charges the EMI has a determining role in the selection of methodologies. However, the following is stipulated by law:

- The EMI has to approve all individual network charges and the methodology for calculation of the fees for connection to the network prior to entry into force.
- The prices for network services shall be justified, based on the expenses necessary for the operation and development of the network, reliability and security of supply, metering of the gas distributed through the network, transmitting and computation of meter readings and earning of a justified profit to ensure a smooth supply of gas to final customers.
- The tariffs for network services shall be set in a manner which ensures:
 - 1) that necessary operating expenses are covered
 - 2) that investments for operational performance and meeting of development obligations are made
 - 3) compliance with environmental requirements
 - 4) compliance with quality and safety requirements
 - 5) justified profitability.
- The EMI elaborates and discloses unified methodologies for calculation of network charges, which serve as the basis for approval.

So it is up to the regulatory authority to decide upon the selection of methodologies. In the elaboration of methodologies opinion of enterprises has been considered and in fact the methodologies were prepared in the process of mutual consultations between the EMI and the undertakings. In the regulation of network charges a principle is used by which an undertaking submits application for price approval according to necessity and the approved prices are valid until approval of new prices.

In the following the basics of tariff formation is described.

Sale volume of network service

Evaluation of the volumes of sale is of an extreme importance. As regards network services, fixed cost is dominant in the cost structure. Hence, the higher the sales, the lower the charge for the use of network. In the evaluation of the sale volume of network services historic statistical dynamics data are used, as well as the comparison of consumption and the number of customers. The latter method is effective first of all in case of household customers since there are some certain established levels of consumption per one customer (m³ per customer).

Uncontrollable cost

Cost is considered uncontrollable if undertakings cannot influence it by their economic performance and this means that no saving obligation can be imposed on it. Uncontrollable cost is the state fees and the charges paid to other operators for network services. For example, all small operators, which have connected with the network of *AS EG Võrguteenus*, have to pay for the service.

Fixed cost

Fixed cost is subject to a deep analysis by the EMI. The basic methods for evaluation of fixed cost is comparison with similar undertakings (*benchmarking*), analysis of cost dynamics and the analysis and audit of individual cost components. A precondition for using comparison is an availability of a number of similar undertakings. In the regulation of distribution networks comparison can be successfully used only for regulation of smaller network operators, since there are 31 distribution operators in Estonia, as mentioned before there. At the same time it is problematic to apply comparison method for the regulation of the distribution network belonging to *AS EG Võrguteenus*, as this network is tens of times larger than other networks. This makes using of benchmarking in cost analysis of this undertaking practically impossible. The only chance is comparison with the distribution networks of other countries. Similar problem exists also with the transmission network of *AS EG Võrguteenus*, where it can be compared only with the transmission networks of other countries.

Other substantial methods for fixed cost analysis are the dynamics of cost and the analysis of individual cost components. In the analysis of dynamics it is assumed that their growth shall not exceed the inflation reflected by consumer price index (RPI). In addition, undertakings shall achieve cost reductions through higher efficiency and productivity. In the analysis of individual cost components justification of them is monitored. Basic cost articles of network operators are operation and maintenance, labour expenses, sales cost etc. Among others the EMI verifies in the analysis process whether an undertaking buys services at a competitive market price, whether goods, works and services are purchased in compliance with procurement rules.

Capital expenditure (depreciation of fixed assets)

Similarly to the regulation of electricity networks for gas networks the EMI also uses a regulatory capital cost method, which, as a rule, differs from accounting depreciation. Advantages of the regulatory method are its simplicity of calculation and transparency for both customers and undertakings, as well as to the regulatory authority. Since only two fixed assets' depreciation rates are used, the monitoring of accounts of both the regulatory assets and capital expenditure becomes very simple and understandable. Accounting of regulatory depreciation use a principle in which capital cost is included in network tariffs according to the technical lifespan of fixed assets.

In the regulatory capital cost accounting a principle is used in which, from a certain selected moment in time, the fixed assets are divided into two parts, the old ones and the new investments, and a reference year is fixed. The assets acquired before that are regarded old ones and for them a single constant rate of depreciation is applied, which considers both the structure and the age of assets. A single constant weighted average depreciation rate is applied also to the new investments. The basis for calculation of the rate is the structure of assets.

The majority of the networks of small undertakings have been built during the last five years. Therefore, these are new investments that are considered new assets and in the accounting of capital cost a single depreciation rate for new fixed assets is used. Contrary, the transmission and distribution networks of *AS EG Võrguteenus* were dominantly built during the former Soviet Union and for these networks separate old and new fixed assets' depreciation rate is used.

Justified profitability

Similarly to other regulatory authorities for calculation of the justified return a model is used, which considers a weighted average cost of capital (WACC) and the regulatory assets. Besides other factors, a weighted average cost of capital depends on the risks involved in individual undertakings. Particularly, the WACC value calculated by the EMI for *AS EG Võrguteenus* is 8,3 per cent and for small network operators 10 per cent. A foundation for determination of WACC is a risk free rate of return. In Estonia governmental bonds are essentially missing. For that reason the EMI bases in the determination of risk free return on the German 10-year state bond return in the last 5 years. To this an Estonian state risk is added. The 5-year historic return is used in order to eliminate market fluctuations in the calculation of a justified return.

Regulatory assets

The basis for determination of both cost of capital cost (capital expenditure) and a justified return is the regulatory asset base, for which the EMI applies principles similar to those used by other regulatory authorities. In accounting of the regulatory assets its continuity is of an extreme importance. Accounting of the regulatory assets is based on the principle according to which to an initial value of assets the investments are added and a regulatory capital cost is subtracted. As a rule, for initial value the book value is taken. In verification of the value of assets of small undertakings the EMI has used comparative method as well. In this case the asset value of various undertakings is compared with the length of network (in kilometres) and with the volume of consumption. As the investments of smaller network operators

have been made mainly after 2000, in the analysis of regulatory assets the EMI has also verified economic feasibility of the investments made.

The investments necessary for construction of gas network are financed from two resources: equity financing of the so-called development investments and using the fees paid by customers for connecting to the network. According to the Natural Gas Act the calculation of the fees should base on the principle that covers justified cost only for the particular connecting, as well as covers the cost of securing environmental, quality and safety requirements. The Act does not stipulate which portion of the investment should be covered by equity financing and which portion from connecting fees. For example, a completely new network can be erected on principle that all investment cost is covered by consumer paid connection fees. Thus, it is up to the enterprise to decide upon the financing scheme. The connection fees paid by customers are already paid once and it cannot be charged twice from them, i.e. this cost is not included in the network charges. Therefore, in case the entire network erection is financed by consumer paid connection fees, the undertaking has no regulatory assets and neither capital expenditure nor profit is included in the tariffs.

4.1.3 Quality of gas supply

Gas supply quality requirements were established by amending the Natural Gas Act in the beginning of 2007. According to the amendments a fault caused sequential duration of an interruption of gas supply may not last longer than 72 hours and an annual total duration of interruptions may not be longer than 130 hours. Records on duration of interruptions shall be kept by network operators, while the EMI's responsibility is the monitoring of fulfilment of quality requirements.

4.1.4 Balance responsibility

Initial regulation of balance responsibility was stipulated by the Natural Gas Act that entered into force in July 2003. It was amended in the end of 2005. In January 2006, in the very cold period, a shortage of gas supply took place and an insufficient regulation of balance responsibility became apparent. This caused remarkable amending of the Act, specifically its balance responsibility related section. The amendments were enforced in March 2007. According to the amendments every market participant is responsible for its balance. The trading period is one twenty four hour period and for household customers' balance their network operator is responsible. Balance is determined by the Act as the balance between the quantity of gas agreed upon by sale contract of a market participant and the quantity of gas consumed or re-sold by the market participant. This means essentially that all market participants, excluding households, are responsible to secure that their 24 hour consumption quantity corresponds to the quantity agreed upon by the contract.

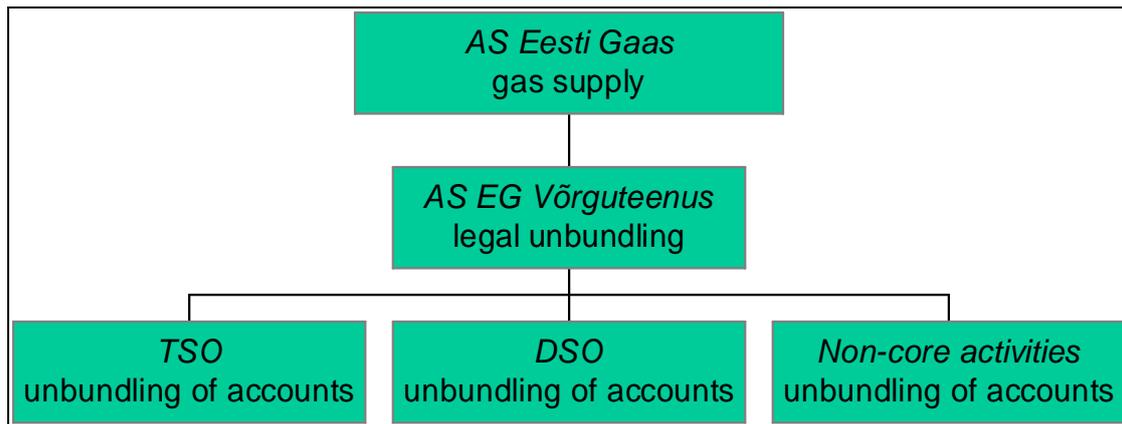
Balance responsibility is organised in a principle, where the system operator (*AS EG Vörguteenus*) is responsible for the balance of the whole system and there may be several balance providers on the market. In order to ensure balance the system operator buys or sells balancing gas. If, for instance, a customer consumed more gas

than agreed upon by the contract, it has to buy the missing quantity at the price of balancing gas. In an opposite case it has to sell the excess quantity at the price of balancing gas. Presumably, the missing balancing gas price is higher than the contractual and vice versa, the excess balancing gas price is lower than the contractual one. In essence, the situation shall be similar to stock exchange, in which in case of shortage the price rises and in case of excess drops. Whereas, consumers do not have to participate in the “stock games”, but they can delegate all the balance responsibility to their seller that secures availability of necessary gas quantities.

A specific of the Estonian gas market is an extreme concentration. Only two undertakings import gas: *AS Eesti Gaas* and *AS Nitrofert*. *AS Nitrofert* is a chemical industry using gas in its technological process and imports gas for its own needs only. Thus, *AS Eesti Gaas* imports all the gas needed for all other customers, while besides selling of gas to other network operators and customers it is also the balance provider. That means, in doing so the sale tariff also includes balancing service cost. According to the explanation by *AS Eesti Gaas* it plans to conclude with larger gas customers (consuming over 50 000 m³ daily, currently 10 customers) fixed supply contracts. That means, *AS Eesti Gaas* guarantees gas quantities up to the contractual ones at a fixed price, while above the contractual quantities have to be bought at the price of balancing gas. With small customers, including households, the so-called open supply contracts will be concluded, according to which *AS Eesti Gaas* secures all necessary quantities to them.

4.1.5 Unbundling of activities

According to the Natural Gas Act the distribution network operator shall form a separate undertaking if the number of customers is over 100 000. In fact, there is no distribution network operators with more than 100 000 customers in Estonia. The transmission network operator shall be legally unbundled. However, it is allowed to establish a business entity that performs both transmission and distribution service provision. *AS Eesti Gaas* that possesses both the transmission network and the distribution network with the largest market share has established business entity *AS EG Võrguteenus* that provides both transmission and distribution service. So it is the so-called combined network operator within which transmission, distribution and secondary (ancillary) activities are separated by accounts and disclosed. In doing so the undertaking is obliged to establish accounting rules for distribution of assets and liabilities, revenue and cost. The annual report shall be supplemented by an auditor's evaluation of justification of the cost distribution.



Drawing 4.1.4 Structure of AS Eesti Gaas

All other distribution networks besides *AS EG Võrguteenus*, currently altogether 31 undertakings, as well as the undertakings with less than 100 000 customers shall separate their accounts by areas of activity as follows:

- provision of distribution service
- sale of gas to non-eligible customers
- sale of gas to household customers
- secondary (ancillary) activities.

The EMI has elaborated and disclosed on its web site respective guidelines and report forms which are helpful for undertakings in separation of accounts. In doing so undertakings are obliged to establish accounting rules for distribution of assets, liabilities, revenue and cost. Their annual report shall be supplemented by an auditor's evaluation of justification of the cost distribution.

In addition to account separation for network service, sale of gas and secondary activity undertakings shall separate their accounts also by different services (the so-called regulatory stipulated activity separation).

Combined network operators (*AS EG Võrguteenus*) are obliged to separate their accounts as follows:

- sale of transmission service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)
- sale of distribution service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)
- transit of gas (*ex-post* regulation, the EMI has the right to monitor justification of prices)
- charges paid by customers for connecting to network (*ex-ante* regulation, the EMI approves methodology for calculation of connection fees separately for every undertaking)
- sale of balancing energy (*ex-post* regulation, the EMI has the right to monitor justification of prices)
- secondary (ancillary) activity.

A distribution network operator that is not obliged to form a separate business entity shall separate its accounts as follows:

- natural gas sale to non-eligible customers (the EMI approves a weighted average price)
- natural gas sale to eligible customers (the EMI has the right to monitor whether cross-subsidising is avoided in the sale to eligible and non-eligible customers)
- sale of distribution service (*ex-ante* regulation, the EMI approves network charges prior to their entry into force)
- customers paid charges for connecting to the network (*ex-ante* regulation, the EMI approves methodology for calculation of connection charges separately for every undertaking)
- secondary (ancillary) activity.

Separation of activities of *AS EG Võrguteenus* is reflected in table 4.1.4 below

Table 4.1.4 Unbundling of activities in natural gas sectors

	Gas transmission	Gas distribution
Separate headquarters (yes/no)	Yes	Yes
Undertakings acting as separate business entities (yes/no)	Yes	Yes
Separate accounts together with guidelines of the regulatory authority (yes/no)	Yes	Yes
Auditing of separation of account (yes/no) ¹	Yes	No
Disclosure of separated accounts (yes/no)	Yes	Yes
Separate management board in which board members of other group undertaking's do not participate (yes/no)	Yes	Yes

AS EG Võrguteenus is obliged to elaborate an action plan with measures for equal treatment of other gas undertakings and customers including duties of employees in the implementation of these measures. The EMI has prepared guidelines for elaboration of such plan. It is disclosed on the EMI's web site. According to the guidelines it is recommended to compile the plan in a 3-year perspective. Annually, *AS EG Võrguteenus* shall report to the EMI on the implementation of the plan. Both the plan and the report are public documents and all interested parties can get acquainted with them. If the EMI is in an opinion that the plan is not sufficient and does not comply with requirements, a revision of the plan and it's changing may be required.

From the point of view of activity separation the most important is the separation within *AS Eesti Gaas* as the group, which has a market dominant position not only in network service provision but also in wholesale and retail. As already explained above *AS EG Võrguteenus* is a separate business entity with 100 per cent shares belonging to *AS Eesti Gaas*. Unlike the Electricity Market Act the Natural gas Act does not stipulate limitations for management and supervisory board. The management board has two members, while the supervisory board has three members. However, all members are employees of Mother Company *AS Eesti Gaas*. The company office together with dispatch centre locates in a separate building and the logo, which is remarkably different from the Mother Company's logo, is an indicator of wishes to present the company to public as an undertaking different from Mother Company.



An extremely important factor from the point of view of gas network operators' independence is the management of undertakings. Essentially, the Mother Company's competence should only be limited to investments into productivity of assets, annual budget and approval of the long-term business plan. In the rest the networks should be independent. According to the company's action plan daily management of the network operator, incl. the services of system operation, are exceptionally the competence of the management board.

Thus, the Estonian gas market is characterised by the situation in which there is a big number of network operators (31 undertakings), but the share of the largest distribution operator *AS EG Võrguteenus* is more than 90 per cent. It is also a rule that the assets needed for provision of network services belong to undertakings and a scheme in which the network owner and its operator are different undertakings is not the case in Estonia.

As regards *AS EG Võrguteenus* and belonging to it the system operator (the transmission network operator) an important issue is to have an action plan for possible crisis situation in which limitation of consumption may become unavoidable. Today the company has an internal action plan for possible crisis situations. However, the principles of the plan are not regulated by legislation. In connection with entering into force of the EU Directive 2004/67/EU, which deals with the measures of gas security of supply, amendments to the Natural Gas Act were enforced. Among others they regulate system operator's actions in possible crisis situation in which consumption limitations may become necessary.

In the promotion of networks' independence and their price regulation it is important to supervise the price formation for services purchased from Mother Company and other undertakings belonging to the group. Regarding services purchased from Mother Company the EMI has followed principles that the prices may not exceed competitive market ones and all procurement rules have to be complied with. According to the Public Procurement Act gas network undertakings as natural monopolies have to fulfil certain requirements in procurement procedures stipulated in the Act.

In summary it can be realised that Estonia completely fulfils EU Directives' requirements for separation of areas of activity. *AS Eesti Gaas* has less than 100 000 customers and according to that the combined network operator *AS EG Võrguteenus* that provides both transmission and distribution services has been established. Transmission and distribution have separate accounts. Other distribution network operators (having less than 100 000 customers) have separate accounts for distribution service and sale.

4.2 Competition in gas market

4.2.1 Wholesale market

A feature of Estonian gas market is its illusive openness – in 2006 the market was opened by 95 per cent (all customers but households are eligible). Since 1st July 2007 the market is opened in the whole. However, in essence the market is opened just formally as there is no real competition.

As explained above Estonia has cross-border connections only with Russia and Latvia, and the only supplier of gas is Russia. All the gas sold in the wholesale market is imported by *AS Eesti Gaas* as there is no other competitive whole sellers. In addition the chemical industry *AS Nitrofert* also imports gas, but exclusively for its own technological needs. Law allows import of gas for all market participants. However, the Natural Gas Act provides for an activity licence if gas is imported from outside the EU, but the application of it is simple, just fulfilment of some formal requirements.

Thus, a situation takes place in which besides a network operator that belongs to *AS Eesti Gaas* group there are also 30 small network operators that sell network services and natural gas to their customers. The small operators buy gas exceptionally from *AS Eesti Gaas* and the big majority of their customers are households. Since 1st July 2007 the whole gas market is opened. This creates a situation in which *AS Eesti Gaas* besides the wholesale market will also dictate the entire retail market. General indicators of the wholesale market are presented in table 4.2.1 below. As seen from the table the Estonian gas market is essentially under control of one company *AS Eesti Gaas*.

Table 4.2.1 Gas wholesale market overview

Year	Gas consumption	Incl import	Consumption peak		Transmission system pass-through capacity		No of companies importing gas	Market share of three largest whole sellers %
			Thousand m ³ /daily	MW	thousand m ³ /daily	MW		
2001	865,2	865,2	5 400	2 099	11 000	4 276	2	100
2002	723,8	723,8	5 000	1 944	11 000	4 276	2	100
2003	838,4	838,4	5 500	2 138	11 000	4 276	2	100
2004	961,8	961,8	5 100	1 983	11 000	4 276	2	100
2005	990,8	990,8	5 200	2 022	11 000	4 276	2	100
2006	1 008,0	1 008,0	6 700	2 605	11 000	4 276	2	100
2007 progn	950,0	950,0	6 350	2 469	11 100	4 315	2 ¹	100

Note: ¹The real gas importer is only *AS Eesti Gaas*, as another importer *AS Nitrofert* imports gas only for its own needs.

Price regulation is not applied neither in case of wholesale nor in case of sale to eligible customers. *AS Eesti Gaas*, as the only wholesaler, sells gas at negotiated price to eligible customers connected to its network, as well as re-sells gas to other network

operators. The amendments to the Natural Gas Act that were enforced in March 2007 clarified the obligations of market dominant gas sellers. According to the amendments a market dominant gas undertaking has to disclose conditions of gas sale and the principles of gas price formation, as well as be guided in elaboration of them from the equal treatment and transparency principles. The sale price of gas shall ensure coverage of operational cost, needed investments and justified return. In essence, the amendments mean that *AS Eesti Gaas* as a market dominant undertaking has to sell gas at equal price and conditions to all eligible customers, and to all network operators as well. The Inspectorate has legal obligation to supervise the activities of *AS Eesti Gaas*. In case of incompliance with above described conditions the EMI is entitled to require action in order to ensure compliance.

The EMI is in an opinion that the described amendments were necessary and does not at all prohibit from functioning of the market, as well as does not place *AS Eesti Gaas* into unfair conditions. The real Estonian situation is so that alternative gas sellers do not exist and it is unlikely that a real competition can appear in the wholesale market in the near future. Besides Russia gas can be imported from Latvia, but the situation there is similar – the majority shareholder of the market dominant gas seller is the exporter of gas Gazprom. So, potential gas importers have no real opportunities to purchase gas at more favourable conditions. The EMI has constantly monitored the situation on market and the major problem has just been the selling at different prices to customers being in similar conditions. Thereby it can be foreseen that the amendments facilitate market settlement and enable all market participants to buy gas at equal conditions.

In addition *AS Eesti Gaas* as the market dominant enterprise with 100 per cent wholesale market share fulfil requirements derived from the Competition Act. The Act prohibits from any direct or indirect abuse of the dominant position on a goods market, including:

- 1) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;
- 2) limiting production, service, goods markets, technical development or investment;
- 3) offering or applying dissimilar conditions to equivalent agreements with other trading parties, thereby placing some of them at a competitive disadvantage;
- 4) making entry into an agreement subject to acceptance by the other parties of supplementary obligations, which have no connection with the subject of such agreement;
- 5) forcing an undertaking to concentrate, enter into an agreement, which restricts competition, engage in concerted practices or adopt a decision together with the undertaking or another undertaking;
- 6) unjustified refusal to sell or buy goods.

Thus, in compliance with the Competition Act AS Eesti Gaas has to follow in its sale activity that the expenses and return are justified and reasonable, and gas is sold to all customers at equal conditions.

4.2.2 Retail market

AS Eesti Gaas is in the leading position also in the retail market. Its retail market share is 93 per cent, thus being undisputable market leader, as also the rest of retail gas is also purchased from *AS Eesti Gaas*. Its retail sales total about 725 thousand m³ per annum. The second largest undertaking has the retail quantity of only 10 thousand m³. This expressively shows how large is the *AS Eesti Gaas*' share on the market. As it was described in the previous chapter, besides *AS Eesti Gaas* there are 30 smaller network operators that sell both network service and gas to customers connected to their network. There is no sellers which are independent from gas network operators and no one customer has changed the seller by today, although it is fully possible to eligible customers. Table 4.2.2 below presents a retail market overview, which, similarly to the wholesale market, is characterised by an extreme concentration.

Table 4.2.2 Gas retail market overview

Year	Retail market consumption mln m ³	No of undertakings with market share of over 5%	No of sellers independent from network operators	Market share of three largest undertakings				No of customers that changed supplier
				Power plants	Large industries	Medium industries	Small business and households	
2001	789	1	0	100	100	100	100%	0
2002	675,4	1	0	100	100	100	99%	0
2003	732,4	1	0	100	100	100	99%	0
2004	748,9	1	0	100	100	100	98%	0
2005	774,4	1	0	100	100	100	97%	0
2006	793,5	1	0	100	100	100	97%	0
2007 prog	775,0	1	0	100	100	100	93%	0

The EMI anticipates appearance of a certain retail market after full opening of the market in 1st July 2007. Namely, it can be foreseen that many customers presently connected to their respective small networks may wish to buy gas directly from *AS Eesti Gaas*. Since *AS Eesti Gaas*, as the seller of gas and at the same time, according to the Competition Act, an undertaking with a market dominant position, it has an obligation to sell gas to all customers connected to other networks at equal conditions. Thus, after full opening of market some changes of seller can be expected by customers.

Data about gas prices are presented in table 4.2.3 below. It can be realised that both for industrial and household customers a steep price increase took place. This was caused by the increase of gas sale price, while the network charges left unchanged, at the level of 2005. In 2005 large industrial customers paid for gas together with

network services in average 1850 kroons/1000 m³. In 2006 they had to pay in average 2800 kr/1000 m³. Thus, for this customer group the price rose by more than 50 per cent. Respective price figures for households are from 2 540 in 2005 to 3 785 kroons/1000 m³ in 2006, which also gives an increase of close to 50 per cent.

Table 4.2.3 Gas final consumer price in 2006

€/MWh (EEK/1000 m ³)	I4	I1	D3
Network service	1,47 211	1,47 211	5,32 766
Taxes in network charges	0,000	0,000	0,000
Nat gas price without network service	18,06 2 600	20,97 3 019	20,97 3 019
VAT 18%	3,51 506	4,04 581	4,73 681
Final consumer price incl VAT	23,04 3 317	26,47 3811	31,02 4 466

Notes:

According to Eurostat definitions:

- large industrial customer (I4) with an annual consumption of 116 300 MWh or 12 600 thou m³
- commercial customer (I1) one with an annual consumption of 116,3 MWh or 12,6 thou m³
- household customer (D3) one with an annual consumption of 23 260 kWh or 2,53 thou m³

Prices of network services according to AS EG Vörguteenus price list.

Since the unit for network service prices is thousand m³, then in brackets also prices in EEK/thou m³; calorific heat value of gas is 9,2 MWh/thu m³

1 € = 15,65 EEK

4.2.3 Selling obligation and price regulation

General data on the regulation of final consumer gas price are presented in table 6.2.1 below.

Table 6.2.1 Final consumer price regulation

	Large customers	Middle and small business customers	Household customers
Regulated price (Yes / No)	No	No	Yes
Percentage of customers that buy gas at regulated price	0	0	100
Possibility to change from market price back to regulated price (Yes / No)	No	No	Yes
Gas sellers which are obliged to sell at regulated price	0	0	All enterprises

The Natural Gas Act stipulates direct selling obligation to all network undertakings in respect of household customers. According to the Act a seller of gas possessing the biggest market share within its network area is required to sell gas, within the technical limits of the network, to all household customers who have a network connection and are willing to buy. Whereas the Act provides for a general sale

obligation principle in the formulation, according to which a gas undertaking shall secure gas supply to all customers in accordance with the Act, conditions of licence and contracts entered into.

The EMI has set forth a condition to *AS Eesti Gaas* in the activity licence, which requires selling to all network operators, customers and other sellers within the technical limits of the network. Derived from the Act and the activity licence it can be concluded that *AS Eesti Gaas* as the market dominate undertaking has the selling obligation in respect of all market participants.

The Natural Gas Act stipulates the regulation of price for household customers, which, according to the Act shall be applicable also after full opening of the market in 1st July 2007. Principles of approval of the price of gas sold to households are similar to those of the network price regulation. The price implies three main components: justified costs, expenditure of capital (depreciation of fixed assets) and justified profitability (return). The EMI elaborates and discloses the unified methodology for calculating of the price limits for household customers, which forms the basis for approval. Respective methodology is disclosed on the EMI website. In the evaluation of justified cost the EMI first of all considers the principle of cost savings and monitors whether cross-subsidising of areas of activity is avoided. The prices are not indexed and instead, approved only upon applications from undertakings.

Unlike electricity sale price for natural gas no weighted average price is approved. Instead, if undertakings sell gas to various customer groups at different prices, the EMI approves individually all the price limits. *AS Eesti Gaas* has formed different limit prices depending on the volume of annual consumption. The majority of smaller network operators have established a single limit price for all households irrespective of their annual consumption volume.

4.3 Competition supervision

Similarly to electricity market the authority responsible for competition supervision is the Competition Board. The function of the EMI is first of all supervision of network operators, while the Competition Board has concentrated primarily on supervision of natural gas sale issues. In the end of 2006 the EMI and the Competition Board entered into a co-operation agreement according to which the parties co-operate in the supervision of energy undertakings.

When it comes to gas sale, *AS Eesti Gaas* is indisputably in a market dominating position, as it is essentially the only gas importer and re-seller (*AS Nitrofert* has so far imported gas merely for its own needs and has never acted as a re-seller of gas). As a market dominant undertaking, *AS Eesti Gaas* has to fulfil the requirements of the Competition Act according to which any direct or indirect abuse of the dominant position on a goods market is prohibited, including:

- 1) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;

- 2) limiting production, service, goods markets, technical development or investment;
- 3) offering or applying dissimilar conditions to equivalent agreements with other trading parties, thereby placing some of them at a competitive disadvantage;
- 4) making entry into an agreement subject to acceptance by the other parties of supplementary obligations, which have no connection with the subject of such agreement;
- 5) forcing an undertaking to concentrate, enter into an agreement, which restricts competition, engage in concerted practices or adopt a decision together with the undertaking or another undertaking;
- 6) unjustified refusal to sell or buy goods.

As the EMI regulates also prices of the major part of district heating undertakings and the price of gas sold to households by distribution networks is regulated as well, there is a good overview of prices that *AS Eesti Gaas* applies to different customers. Thus, the EMI also continuously monitors the prices applied to various individual customers.

The Competition Act stipulates obligations for undertakings with special or exclusive rights or in control of essential facilities according to which above mentioned undertakings shall:

- 1) permit other undertakings to gain access to the network, infrastructure or other essential facility under reasonable and non-discriminatory conditions for the purposes of the supply or sale of goods;
- 2) keep clear separation of accounts for different primary and secondary activities (e.g. production, transmission, marketing and other areas of activity) enabling thereby transparency of economic performance;
- 3) maintain separate records on revenue and expenditure related to each product or service on the basis of consistently applied and objectively justified principles of calculation, which shall be clearly specified in the internal rules of the undertaking. The calculation of revenue and expenses must enable to assess whether the price of a product or service is in a reasonable ratio with the value of the product or service.

An undertaking with special or exclusive rights or in control of an essential facility may refuse to grant other undertakings access to the network, infrastructure or other essential facility if the refusal is based on objective reasons, including cases where:

- 1) the safety and security of the equipment connected with the network, infrastructure or other essential facility or the efficiency and security of the operation of such network, infrastructure or facility are endangered;
- 2) maintenance of the integrity or the inter-operability of the network, infrastructure or other essential facility is endangered;

- 3) equipment to be connected to the network, infrastructure or other essential facility is not in conformity with the established technical standards or rules;
- 4) the undertaking applying for access lacks the technical and financial capability and resources to provide services efficiently and safely to the necessary extent through or with the assistance of the network, infrastructure or other essential facility;
- 5) the undertaking applying for access does not hold the permit prescribed by law for the corresponding activity;
- 6) as a result of such access, data protection provided by law is no longer ensured.

Therefore the gas networks are undertakings possessing essential facility, as per the Competition Act. The Natural Gas Act regulates the activities of network operators in detail and assigns the supervisory function to the EMI. Although the supervision of the activities of network operators is first of all the EMI competence, this does not prevent the Competition Board from carrying out its supervision over network operators.

In conclusion it should be realised that in spite of good legislative base there is no operational gas market in Estonia. Moreover, appearance of an operational gas market is unrealistic also in the future as all three Baltic countries are supplied with gas from a single source – from Russia. A little volume market may appear in the future in connection with balancing gas. It can also be assumed that together with the opening of household customer market changes of seller may take place.

4.4 Obligations of market participants and customer protection

4.4.1 General obligations of market participants

Obligations of market participants are stipulated in the Natural Gas Act. Besides obligations stipulated by the Act the EMI issues activity licences that include also some specific conditions. An activity licence is required for the following activities:

- 1) import of gas (from outside the EU);
- 2) sale of gas;
- 3) provision of gas transmission service;
- 4) provision of gas distribution service.

In most detail the Natural Gas Act regulates activities of network operators. Their main stipulated obligations are described as follows:

- 1) a network operator is required to ensure that persons who have a network connection are supplied with gas in accordance with this Act, the conditions of the activity licence and contracts entered into;

- 2) a network operator is required to enable third party access to the network, which for the purpose of the Act means the right of market participants to connect with the network or to use network services;
- 3) a network operator is responsible for the functioning and maintenance of the network which it owns or possesses;
- 4) a network operator is required to develop the network in a manner which ensures that all consumer installations located within its network area are connected to the network;
- 5) a network operator shall organise the metering of gas consumed from the network and maintain corresponding records, unless agreed otherwise;
- 6) a network operator is required to provide other network operators with all the necessary information to ensure the distribution and sale of gas in a manner which enables interconnected networks to be used securely and effectively;
- 7) a network operator may not disclose the information gained in connection with performing of its duties and obligations to third parties, except if disclosure is provided for by law or, information shall be submitted for carrying out of duties and obligations provided for by this Act;
- 8) a network operator may terminate its activities only if it transfers its obligations arising from this section to another network operator;
- 9) a network operator shall give the EMI at least twelve months' advance written notice of the termination of its activities, specifying the date and schedule for termination, and provide a sufficiently detailed overview of the circumstances which ensure that the requirements provided for shall be met;
- 10) a network operator is obliged to follow the principle of equal treatment of market participants in provision of network services.

In essence the described regulation ensures the provision of network services to all market participants and a third party free access to the network. Possibilities of refusal to provide network services are extremely limited.

For gas sale undertakings law stipulates the following obligations:

- 1) a gas undertaking shall ensure that final customers are supplied with gas in compliance with the Natural Gas Act, the conditions of the activity licence and contracts entered into;
- 2) a gas undertaking that performs both provision of network services and sale of gas shall keep separate accounts for the activities.

4.4.2 Rights and obligations of the Inspectorate

From a supervisory authority point of view the Estonian legislative basis can be considered as a solid one and this gives to the EMI enough possibilities for performing market regulation.

The EMI has the right to get necessary information from a market participant, as well as from state and local municipal authorities, the right to enter their territory, rooms and facilities for the purpose of on-site inspection, examine the documents necessary for supervisory activities and other information and circumstances and make extract, transcripts and copies thereof. The EMI can also inspect the accounts and prices practices applied by gas undertakings and obtain necessary information concerning their economic activities. The EMI can establish temporary prices for the transmission and distribution of gas for no longer than two months in situations where those prices are not justified or the gas undertaking fails to follow a precept issued by the Inspectorate. The EMI can establish development obligations for undertakings through licence conditions. For example, it can impose an obligation to invest for gas network operators in case their performance has not secured stable gas supply for customers in accordance with requirements.

At the same time the EMI is obliged to supervise the fulfilment of the Natural Gas Act and to make precepts in case of violation. Also, market participants (consumers or undertakings) can record complaints on activities or inactivity of other market participants and the Inspectorate has to re-settle them by its decisions. Both the precepts and decisions are administrative acts that can be challenged with an administrative court, which has the right to invalidate an EMI's decision or a precept.

The Natural Gas Act also stipulates that in case of certain violations of law the Inspectorate has the right to initiate misdemeanour proceedings. The following violations of law are determined as misdemeanours:

- 1) failure to give notice of changes to information;
- 2) failure to comply with conditions of activity licence;
- 3) sale of gas or provision of network services at unapproved maximum prices or at prices exceeding approved maximum prices;
- 4) violation of obligation to connect to network and collection of unjustified connection fees;
- 5) failure to provide third party access to the network.

The penalties that can be imposed in case of violation of the position 1) is up to 30 000 kroons (EEK), in other cases of up 50 000 kroons. In the EMI practice an initiation of misdemeanour procedures is rather rare. As of the beginning of 2007 two misdemeanour proceedings were initiated: gas and network service provision at a price exceeding approved limit price.

4.4.3 Customer information

Both gas network operators and gas sellers are obliged to maintain a web site and disclose as a minimum the following information on it:

- 1) charges for network services;
- 2) maximum (limit) prices for gas;
- 3) method of calculating the charge for connecting to the network;
- 4) standard terms and conditions of contracts.

The charges for network services and household customer gas prices shall be disclosed at least ninety days prior to their entry into force. In addition to the web site the prices shall be disclosed at least in one national daily newspaper. Besides undertakings also the EMI shall disclose all the approved prices on its own web site. If a gas undertaking sells both network services and gas, it is obliged to separate in customer bills the price for the network service and for the gas.

4.4.4 Customer contracts, suspension and limitation of gas supply and extra-judicial proceedings

In the previous, 2005 report it had to be realised that in comparison with the Electricity Market Act the conditions of contract are much less regulated by the Natural Gas Act. Also in other aspects, like customer protection, less attention was paid to. However, in March 2007 amendments to the Natural Gas Act were enforced. The amendments pay more attention to customer protection. In addition to the standard terms and conditions for selling gas to household customers now also similar standard conditions have to be approved also for provision of network services. According to the Act the standard conditions of selling to household customers besides others shall include:

- 1) sellers' name and address;
- 2) service provided;
- 3) requirements for the quality level of provided service;
- 4) customer information about the tariffs and prices;
- 5) contract duration, conditions of updating and termination of the contract;
- 6) possibility of change of supplier for free;
- 7) possibilities of payment for the service;
- 8) possible compensations and pay-back procedures;
- 9) settlement of complaints.

Standard terms and conditions for sale of gas to household customers may also include stipulations from the network contract that deal with the provision of network services necessary for distribution of sold gas.

As mentioned above, standard conditions have to be approved also for provision of network services. In doing so the EMI has to monitor whether a balance of a network

service user's rights and obligations is contained in the contract, as this form a basis for the approval of prices for network services.

Standard terms and conditions for sale of gas to eligible customers are not approved by the EMI. However, according to the Natural Gas Act and the Competition Act the market dominant seller (*AS Eesti Gaas*) shall ensure equal treatment of all market participants.

The Natural Gas Act provides for suspension of gas supply. According to it network operators have the right to suspend a network connection without giving advance notice thereof to the final customer if there is a danger to the life, health or property of persons or to the environment. A network operator has the right to suspend a network connection immediately after it is established if there has been an unauthorised consumption (stealing) of gas. Besides, a network operator has the right to suspend gas supply, giving at least seven days' advance notice, if:

- 1) the consumer installation is adversely affecting the supply of gas to another final customer or damaging the technical parameters of the network;
- 2) the network operator is prevented from accessing a metering system located within territory owned or possessed by a final customer in order to inspect or replace the system or to perform necessary work for the gas installation to operate;
- 3) any conditions provided in the contract for the purchase and sale of gas or stipulated conditions are violated.

A new, customer protective aspect in the amendments is the clause related to household customers that fail to pay in time and a network operator intends to suspend gas supply to them. In such case, if a customer has a permanent residential space, which is heated by gas, supply may suspended during the period from 1st October to 1st May, only when at least sixty days have passed since the notice.

Before the gas supply is suspended in cases described above, the network operator shall give the final customer a reasonable term to eliminate the deficiencies and shall notify the final customer of the pending suspension in writing. The notice shall set out the grounds for suspension of gas supply, the term for elimination of the deficiencies. A network connection or gas supply that has been suspended for the reasons explained above shall be restored after the customer has paid for the justified costs of suspension and reconnection, unless the contract has been terminated.

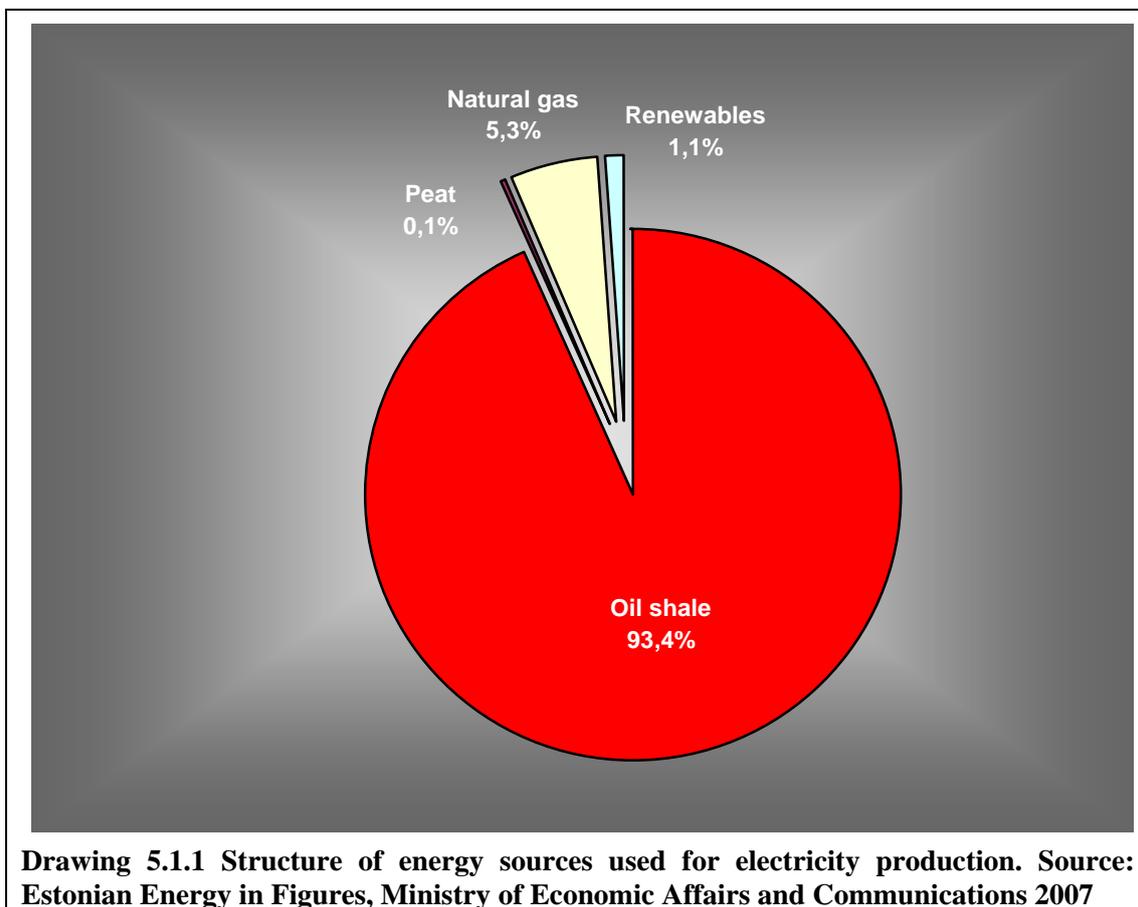
All market participants, both undertakings and customers have the right to refer to the EMI as to the extra-judicial body. A market participant may record a written complaint with the EMI against the action or omission of another market participant that is in conflict with the Electricity Market Act or legislation established on the basis thereof. The EMI reviews the complaint and makes a decision thereon within 30 days as of the receipt of the complaint. If the EMI requests information necessary for resolving a complaint, the passage of the term shall be suspended, but not for longer than 60 days. The EMI's decisions can be challenged with an administrative court in 30 days since receiving of a decision.

Conclusively, the EMI's opinion is that in connections with the selling obligation customers are reasonably well protected. Network operators have the obligation to sell gas to all customers connected to the network. The amendments facilitate to better regulation of customer rights.

5. Security of supply

5.1 Electricity

For electricity production the fundamental fuel in Estonia is oil shale. In 2005 93 per cent of electricity was produced from it, 5 per cent from natural gas and the rest 2 per cent from other energy sources. Thus, Estonia is independent from import of fuels and in electricity production. Since Estonia is electricity exporter, then if needed, all national electricity demand can be covered using domestic fuels and energy sources. Drawing 5.1.1 presents the structure of fuels used for electricity generation.



As regards installed electrical capacity the biggest share also belongs to oil shale fired power plants. Below table 5.1.1 presents data on installed capacity.

Table 5.1.1 Installed electrical capacity in 2007

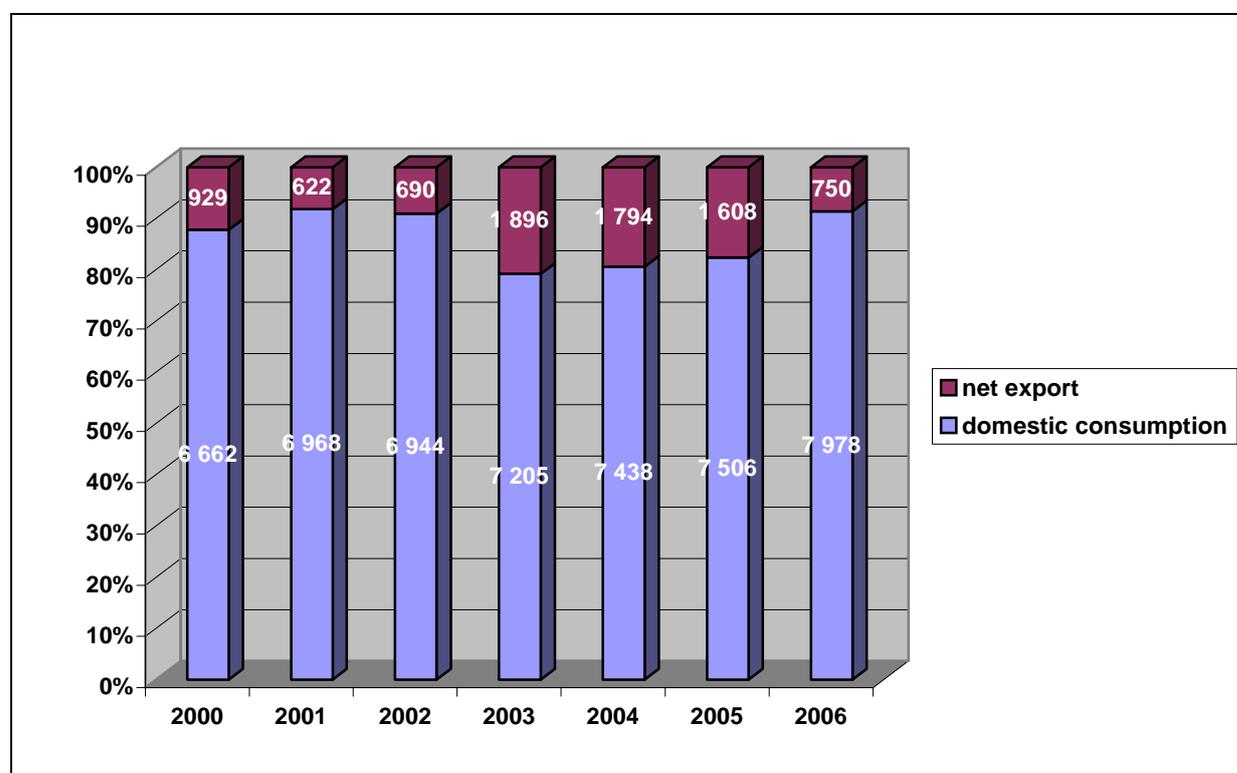
	Capacity MW	Fuel	Owner
Narva Power Plants	2 142	oil shale	Eesti Energia
Iru Power Plant	171	natural gas	Eesti Energia
Ahtme cogeneration plant	27	oil shale	Eesti Energia
Renewables, total	37	wind, hydro, biogas	Private capital
Cogeneration, others	84	oil shale, peat, natural gas	Private capital
Total	2 461		

In the present security of supply analysis the EMI has considered coverage of consumption capacity (load) by year 2015. In the evaluation of coverage two extremely important factors shall be considered: firstly, Estonia is net exporter and secondly, installed capacities exceed peak load today.

Table 5.1.2 presents electricity balance from 2000 to 2006. Drawing 5.1.2 shows graphically the share of net export and domestic consumption of electricity. As seen, the share of export has risen since 2003 and constitutes up to 20 per cent of an annual production. However, in 2006 it still fell again.

Table 5.1.2 Estonian power balance GWh. Source: Statistical Office

	2000	2001	2002	2003	2004	2005	2006
production	7 591	7 590	7 634	9 101	9 232	9 114	8 728
final consumption	5 422	5 607	5 686	6 013	6 326	6 403	6 901
network losses	1 240	1 361	1 258	1 192	1 112	1 103	1 077
net export	929	622	690	1 896	1 794	1 608	750

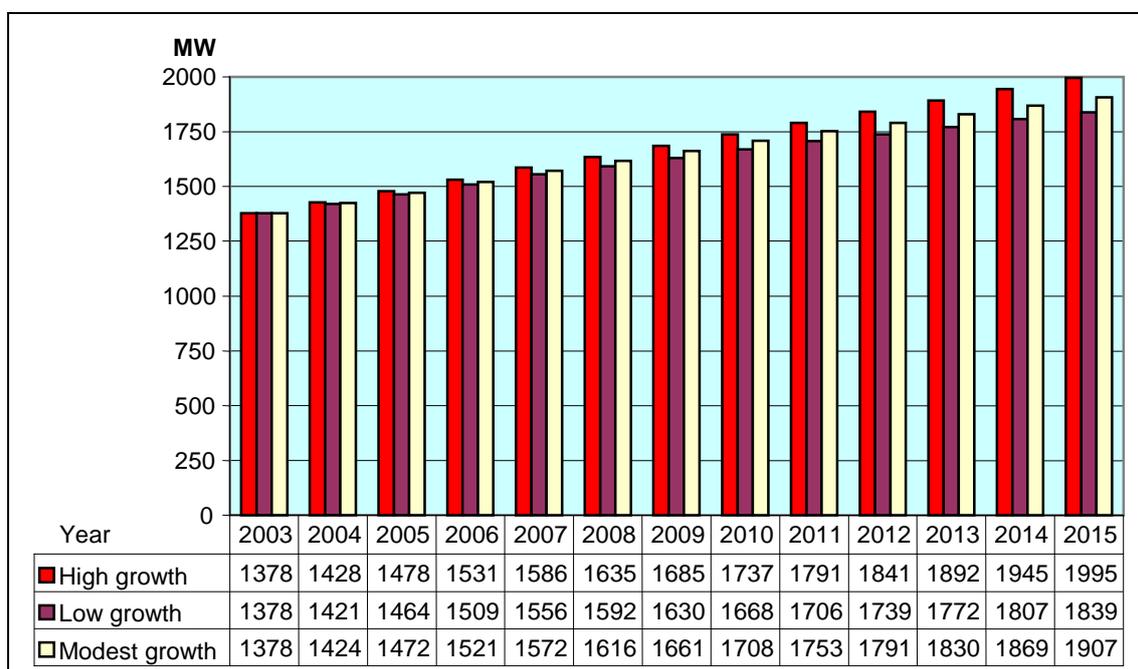


Drawing 5.1.2 Share of domestic consumption and export of electricity GWh. Source: Statistical Office

The available reserve capacity and the system's peak loads are presented in following table 5.1.3.

Table 5.1.3 Available reserve capacity and system peak load. Source: OÜ Põhivõrk

Calendar year	Domestic electricity consumption (incl power losses) GWh*	System peak load MW*	Installed capacity MW**
2001	6632	1321	2876
2002	6704	1336	2726
2003	6946	1475	2723
2004	7098	1318	2675
2005	7376	1331	2230
2006	7605	1555	2059
2007	7937	1537	2050
2008	8160	1616	1866
2009	8390	1661	1933
2010	8627	1708	2020
2011	8851	1753	1865
2012	9043	1791	2401
2013	9239	1830	2239
2014	9441	1869	2088
2015	9629	1907	2088



Drawing 5.1.3 Prognosis of peak load until 2015. Source: Electricity Sector Development Plan

Based on peak load prognosis and the installed capacities, no lack of capacity is foreseen until 2015. Regarding capacity problems they may arise in 2016 when AS Narva Elektriijaamad shall comply with the SO₂ and NO_x emission limitations

stipulated by the Directive on large combustion plants. The problem is that the old energy blocks do not comply with the requirements of the Directive. It should be mentioned that the emission limitations does not necessarily mean immediate closing down the blocks. Modern technologies may offer opportunities for modernisation of old block and thereby bringing them into compliance with the requirements of Directives.

Especially important are *AS Eesti Energia's*, as the market participant with the biggest share, plans in connection with Narva Power Plants (*AS Narva Elektriijaamad*) and also with Iru and Ahtme Power Plant. According to presented information the following capacity developments are planned in the power plants in question:

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Narva Power Plants	2 142	2 142	2 142	1 942	1 942	2 167	2 392	2 392	2 392	2392
incl new capacities						225	450	450	450	450
Iru Power plant	171	171	171	171	421	421	421	421	421	421
incl new capacities					250	250	250	250	250	250
Ahtme Power pLant	27	27	27	23	23	23	23	23	23	23
Other renewable sources	5	5	5	5	55	55	55	55	55	55
TOTAL	2 345	2 345	2 345	2 141	2 441	2 666	2 891	2 891	2 891	2 891

Possible new projects are the following:

2×225 up to 2×300 MW_{el} oil shale fluidized bed technology 2011 to 2012

250 MW_{el} emergency reserve in Iru Power Plant by year 2011

140 MW_{el} regulation reserve in Iru Power Plant by year 2011

23 MW_{el} biofuel cogeneration plant in Ahtme Power Plant by year 2009

Conclusion: today Estonia has no security of supply problems. It is vice versa – the installed capacity is higher than the domestic consumption and this makes export of electricity possible. A capacity shortage is not foreseen before 2016. However, decisions have to be made already today. If by 2016 no new capacity is installed nor no old blocks of *AS Narva Elektriijaamad* are renovated, then Estonia will face a sharp deficiency of generation capacity after 2016. Table below presents installed capacity in 2016 if neither investment nor renovation is undertaken. Wind turbine capacities are not taken into account as they need a regulation reserve anyway.

Installed capacity if investments neither into new installations nor into renovation of the old ones is made by 2016.

2016 if no investmets	Capacity MW	Fuel	Owner
Narva Power Plants	430	oil shale	Eesti Energia
Iru Power Plant	171	natural gas	Eesti Energia
Ahtme cogeneration plant	0	oil shale	Eesti Energia
Others (cogeneration, hydro,others)	90	oil shale, peat, natural as	Private capital
Total	691		

As peak load in 2006 will be 2000 MW, then without investing a situation occurs in which a capacity deficit will be close to 1300 MW or, 65 per cent of needed capacity.

According to the amendments to the Electricity Market Act enforced in 1st May 2007 the system operator (*OÜ Põhivõrk* - National Grid) is obliged to prepare a report, which presents: a prognosis of offer and demand of electricity in next five years, existing supply possibilities; perspective installations and those under construction; quality of networks and their maintenance level; measures of securing maximum (peak) demand and measures undertaken in situation of capacity deficit; security of supply of network; foreseeable electricity security of supply in the period of 5-15 years and investment plans of the transmission network operator and respective ones in neighbouring countries known to him for a five-year period for erection of cross-border connections. The report in question is presented to the EU Commission, to the Ministry of Economic Affairs and Communications and to the EMI. Thus, one of the parts of the report is presenting an evaluation of the need of investments into production capacity. On the basis of the prognosis of the transmission network operator the Inspectorate may oblige the transmission operator to arrange a tendering for new capacity installations.

5.1.1 Estlink and other connections

Most important new infrastructure project is the Estlink, under which a DC cable connection with a capacity of 350 MW was erected between Estonia and Finland. It was commissioned and started commercial operation in December 2006.

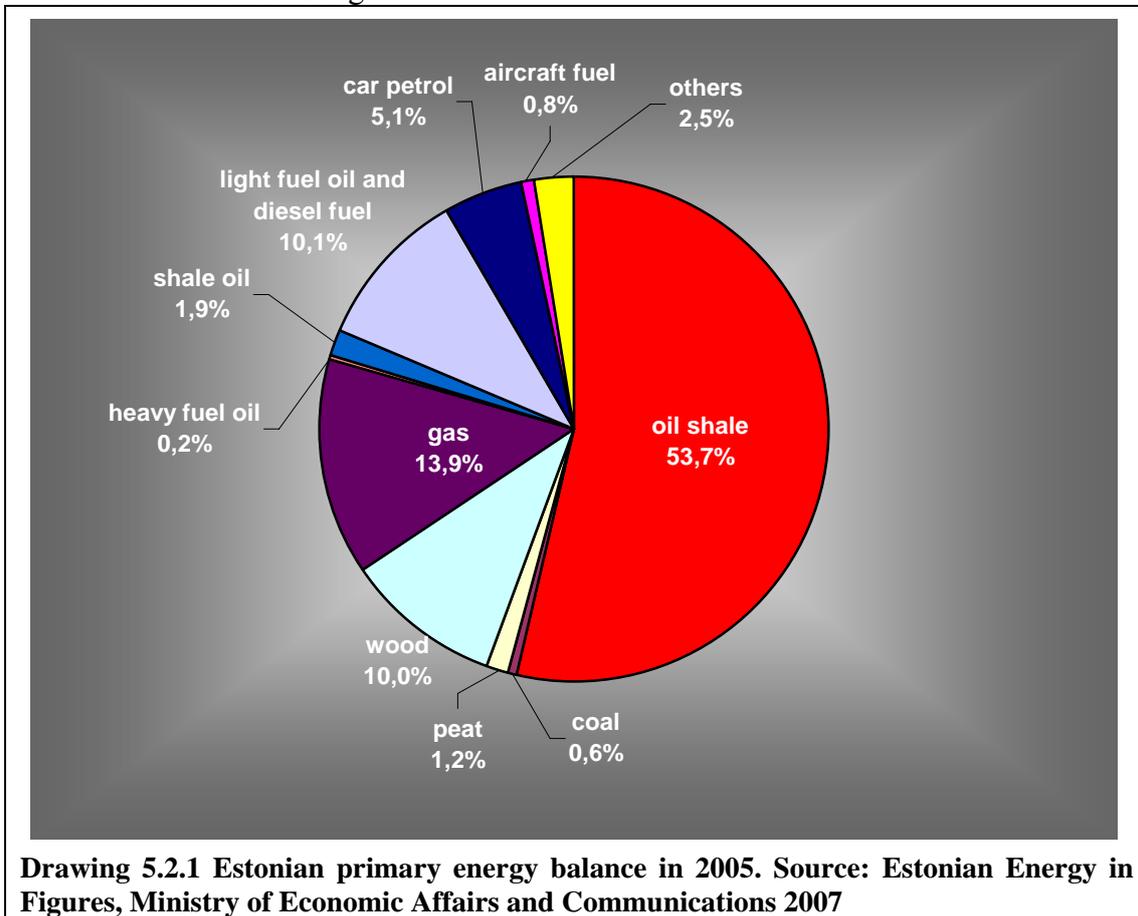
Regarding other infrastructure projects the transmission network operator plans to install another 650 MW sea cable in addition to the 350 MW one by the year 2010. At the latest by 2015 it is planned to raise the pass-through connection capacity between Estonia and Latvia by 200 MW.

5.1.2 Lithuanian nuclear power plant

In 28th February 2006 the prime ministers of the three Baltic countries signed a joint declaration on possible erection of a new nuclear power plant in Lithuania. In 8th March respective agreement was signed also by CEO of the leading energy companies of the three Baltic: *Eesti Energia AS*, *Lietuvos Energija AB* and *VAS Latvenergo*. According to the agreement a joint feasibility study will be carried out upon possible new nuclear plant in Lithuania. The study shows that a new nuclear plant is technically and economically feasible. Since the beginning of 2007 also Poland is involved in the project. According to the information available to the EMI a capacity of the plant shall be of up to 2000 MW, from which an Estonian portion shall be 400 to 500 MW. According to the information from *Eesti Energia AS* possible commissioning time of the new plant is 2015 to 2020.

5.2 Natural gas

In the Estonian primary energy supply balance the share of gas is 13,9 per cent (see drawing 5.2.1), while among fuels used for electricity production its share is only 5,3 per cent. Estonia is net exporter electrical energy, hence, it is possible to cover all national demand without gas.



Considering security of supply issues gas is very important in the production of heat in district heat supply facilities where its share is up to 45,9 per cent. In some bigger sites and towns, like Tallinn, Rakvere, Jõgeva and some others the district heat supply bases 100 per cent on natural gas. The share of gas is high also in Tartu, Viljandi, Sillamäe and several other towns' district heat supply. In 2006 also Pärnu and Rapla towns were connected with the natural gas supply network. Thereby, in the supply of Rapla 100 per cent will base on gas, while in Pärnu an important share will still remain with solid fuels (peat and wood). Thus, from the security of supply point of view, natural gas has the highest importance in the district heat supply sector. Whereas, a specific of Estonia is that 38 per cent is consumed for industrial purpose, while the consumption of the biggest customer – AS Nitrofert – constitute 20 per cent of the total Estonian gas consumption.

Compared to Western Europe local gas heating is relatively little spread in Estonia. The development of smaller gas networks is more intense in real estate development areas. However, the share of natural gas in household consumption in 2006 was still only 8 per cent from the total gas consumption. Whereas, according to AS Eesti Gaas

prognosis first of all in the result of development of smaller networks an annual consumption by households will increase up to 10,5 per cent by 2007.

The share of gas in electricity production is very little. Besides, Estonia has sufficient oil shale based reserve capacity. Hence, from the security of supply view, gas has no importance in electricity generation. At the time, from the security of supply point of view, gas is extremely important in heat supply. While in most district heating systems besides gas also alternative fuels can be used, in local gas heating such possibilities do not exist and in possible gas supply interruption situations the customers would simply be left unheated.

Table 5.2.1 presents general gas supply and consumption figures, while table 5.2.2 gives gas utilisation figures by various sectors.

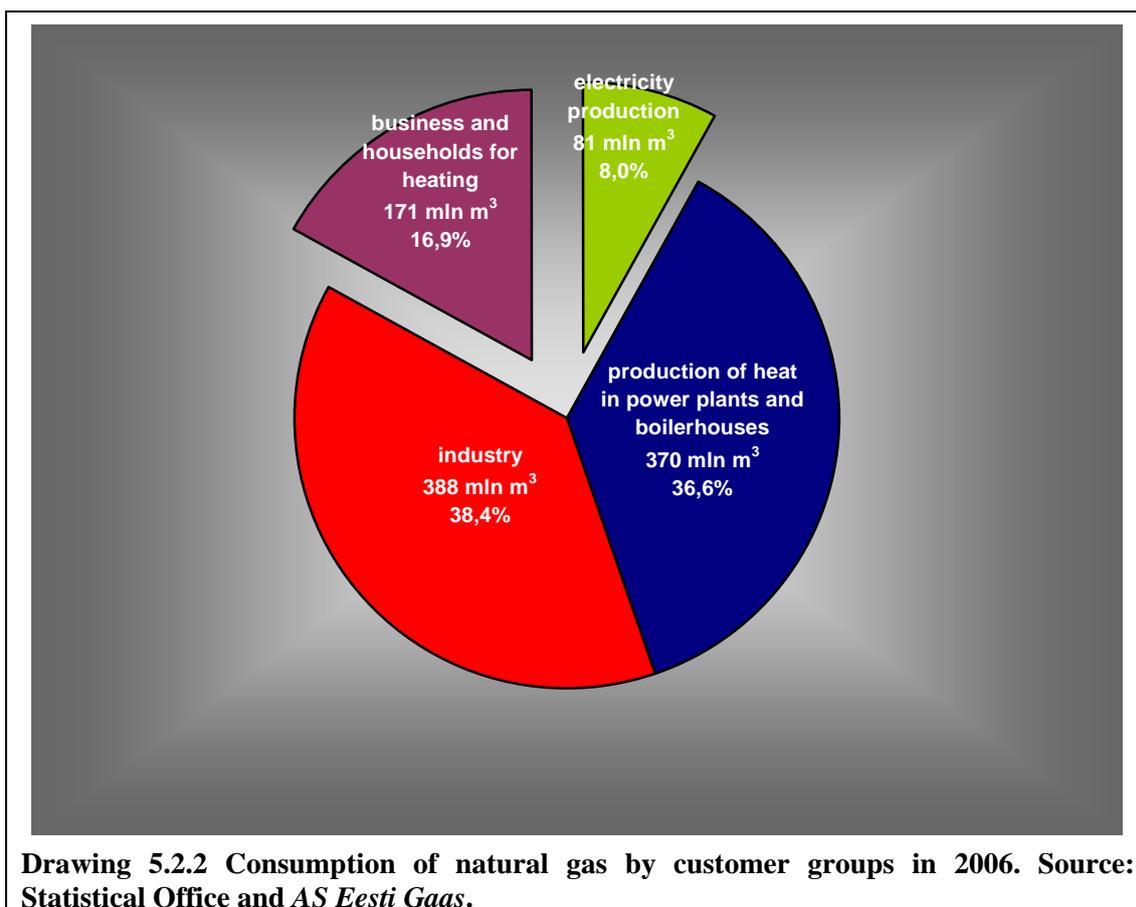
Table 5.2.1 General information on gas supply

	Total consumption mln m ³	Peak load		System pass-through max	
		1000 m ³ /day	MW	1000 m ³ /day	MW
2001	865,2	5 400	2 099	11 000	4 276
2002	723,8	5 000	1 944	11 000	4 276
2003	838,4	5 500	2 138	11 000	4 276
2004	961,8	5 100	1 983	11 000	4 276
2005	990,8	5 200	2 022	11 000	4 276
2006	1 008	6 700	2 605	11 000	4 276
2007 prog. ¹	995	6 350	2 469	11 000	4 276
2008 prog.	1 020	6 700	2 605	11 000	4 276
2009 prog.	1 070	6 850	2 663	11 200	4 354
2010 prog.	1 095	7 000	2 721	11 400	4 432
2011 prog.	1 120	7 150	2 780	11 600	4 510
2012 prog.	1 170	7 300	2 838	11 800	4 587
2013 prog.	1 195	7 400	2 877	11 900	4 626
2014 prog.	1 220	7 500	2 916	12 000	4 665
2015 prog.	1 245	7 600	2 955	12 100	4 704

Notes: ¹2007 predicted peak load according to February data

Table 5.2.2 Use of gas by various sectors in 2005 and 2006

	2006		2005	
	Gas consumption thousand m ³	Share	Gas consumption thousand m ³	Share
Production of electricity	80 557	8,0%	82 889	8,4%
Production of heat in power plants and boiler houses	369 552	36,6%	374 230	37,7%
Industrial customers	387 777	38,4%	374 474	37,7%
Business and households for heating	170 891	16,9%	160 534	16,2%
Total	1 008 777	100,0%	992 127	100,0%



Concerning the security of supply of gas Estonia completely depends on the Russian gas supplies. Estonia has two cross-border transmission connections with Russia: one in Narva (east) direction and the other in Värskä (south-east) direction and one connection with Latvia in Karksi. In normal situation only two of these connections are operational: the Latvian connection and the Russian connection in Värskä. The Narva connection pass-through capacity is limited because of some network limitations on the Russian side and it is opened only in emergency situations. For example, in January 2006 the supplies of gas were increased by 480 thousand m³ daily. As it was already described in the gas market review chapter Estonia has no problems with exhaustion of pass-through capacity, but problems may arise only in extreme peak load conditions.

Concerning new connections possible Estonian-Finnish gas connection is in question. Currently it is under feasibility study phase. Also, a routing selection and an environmental impact assessment have been commenced. However, according to an evaluation by *AS Eesti Gaas* the construction of the gas connection cannot be commenced before 2011.

Gas is imported to Estonia by *AS Eesti Gaas* and the chemical industry *AS Nitrofert*. In fact, *AS Nitrofert* is not involved in selling of gas but imports it exclusively for its own technological needs. In winter period from November to April *AS Eesti Gaas* covers the gas consumption only with the gas from the Latvia located Inčukalns gas storage, while *AS Nitrofert* imports it directly from Russia. Actually, in winter both Estonia and Latvia, and partly also Russia and Lithuania are primarily supplied with

the gas from the Inčukalns storage, which has an active capacity of 2 300 million m³. According to the storage agreement with *AS Läti Gaas* the share of stored gas volume belonging to Estonia is 500 million m³ and the gas quantity Estonia can consume daily to cover its needs from the Latvian storage is 5 000 thousand m³. The analysis of consumption peak loads in year 2001 to 2005 shows that the volume has been sufficient to cover Estonian peak load. The consumption peak of *AS Nitrofert* is about 700 thousand m³ daily. This has to be subtracted from the Estonian totals as *AS Nitrofert* buys gas directly from Russia and is not using Inčukalns gas storage.

In January 2006 between dates 19th to 22nd when weather conditions were extremely cold both in Russia and in Estonia some disturbances occurred in supply. The peak consumption those days reached last years' maximum of 6 700 m³ daily. The EMI has initiated a supervisory proceeding in which also employees of the Ministry of Economic Affairs and Communications were involved. The proceedings identified that the legislation related to security of supply should have to be amended remarkably. The analysis show that the current Natural Gas Act does not sufficiently regulate balance responsibility issues and the system operator (*AS EG Võrguteenus* that belongs to *AS Eesti Gaas* group) had no action plan for regulation of security of supply of the system in crisis situations. The EMI is in a position that the system operator did not meet the criteria of equal treatment of market participants. Supply limitations were only imposed to *OÜ Iru Elektriijaam*, *AS Tallinna Küte* and *AS Narva Elektriijaamad*, i.e. only to the undertakings supplying people with district heat. Whereas, no limitation we applied to industrial customers.

With respect to the EU Directive 2004/67, which stipulates measures for securing gas supplies and considering also the results of above mentioned analysis the Ministry of Economic Affairs and Communications elaborated proposals for amending the Natural Gas Act with measures ensuring security of supply of gas. The amendments were approved by Parliament in March 2007. For securing of gas supplies the following measures are stipulated.

In the period from 1st October to 1st May the household customer's supply with gas may not be interrupted nor limited. In the same period gas supply may not be interrupted nor limited to an undertaking supplying residential space heating and which has no possibility to use fuel other than gas. Gas supply may be interrupted if there is a danger for people's life, health, property or environment is endangered, as well as upon an agreement between parties. A heat supply undertaking with an annual estimated production volume over 500 000 MWh per network area is required since July 2008 to facilitate a possibility of using a reserve fuel that, in order secure heat supply during three days.

In case of occurrence of circumstances that can jeopardise security of supply, endanger people's life and health or the integrity of network, the system operator shall inform the Ministry of Economic Affairs and Communications and the EMI, and makes proposal for implementation of measures which can ensure security of supply. The Ministry in cooperation with the Inspectorate shall analyse the proposal received from the system operator and if necessary, make proposal to the Government for implementation of the following measures for ensuring security of supply:

- 1) limitation of gas supply to the persons which use gas other than for heating purpose;
- 2) allowing gas supply limitations to the undertakings that produce heat;
- 3) allowing lowering the temperature of water supplied for space heating;
- 4) oblige heat supply undertakings to using of a reserve fuel;

Since in Estonia most important is to ensure natural gas supply for heat supplies facilities, it is intended to impose supply limitations of supply first of all to heat producers in Tallinn and Narva. In essence the amendments stipulate a requirement for Tallinn and Narva district heat supply enterprises on facilitation of a possibility of using a reserve fuel and in case of gas supply disturbances switch over to the reserve fuel. A measure for Iru Power Plant provides for running the plant in heat only mode instead of cogeneration mode, in order to reduce gas consumption. In Estonia it is possible as the share of gas in electricity generation is very modest. The power plants fired with gas constitute less than 10 per cent of the installed capacity and the needed electrical power can be generated in oil shale fired Narva Power Plants.

According to the enforced amendments the system operator (*AS EG Võrguteenus*) is required to prepare a description of emergency situations, which can destroy normal operation of the gas system, as well as a plan for resolving of the emergencies. The plan shall be submitted to the Ministry of Economic Affairs and Communications. The plan is to be applied in situations when balance providers fail to ensure gas balance and it becomes unavoidable to limit consumption by certain customer groups.

In conclusion it can be said that Estonia has no shortage of transmission capacity. Based on the consumption and transmission capacity prognosis submitted by AS Eesti Gaas until 2015 and very likel in the farther future there shall be no shortage of transmission capacity. However, problems may arise in connection with security of supply and this in turn can jeopardise heat supplies, which are highly dependent on gas supplies. As in the European part of Russia an overall increase of gas consumption takes place, the Estonian peak load in winter period can be primarily covered with the gas from the Latvian gas storage. For the few coming years AS Eesti Gaas foresees an increase of peak load consumption of up to the level of 7 000 thousand m³/daily. The prognosis assumes that AS Nitrofert will cover its daily consumption of 700 thousand m³ itself. This means that in addition to the current Latvian gas storage supply of 5 000 thousand m³ daily an extra supply of up to 1 300 thousand m³ daily is needed. According to an explanation of *AS Eesti Gaas* it is expected to cover it by direct Russian supplies.

In case of possible supply disturbances it is feasible to limit gas consumption by limitation of electricity generation. Since gas fuelled power plants have no significant role in the coverage of electrical load, then such limitation does not hinder electricity security of supply in Estonia. The Long-term Development Plan for Electricity Sector foresees, as one of the scenarios, a significant rise of the share of gas in electricity generation, through increase of installed capacity up to 900 MW_{el}. Such increase provides for an increase of gas supplies by about 4 500 thousand m³ daily. Considering the events that took place in January 2006 the scenario, which assumes rapid increase of gas generated electricity, is very risky to the country from security of supply point of view.

From technical point of view security of supply shall certainly be improved by an Estonian-Finnish gas pipeline connection to be constructed. According to *AS Eesti Gaas* Finland plans to be connected to the Russian-Finnish pipeline and if a connection between Estonia and Finland will be added then gas supplies to Estonia shall be significantly more secured. The EMI shares a position of *AS Eesti Gaas* that possible new connections shall improve supply security from technical point of view, whereas 100 per cent dependence on Russian supplies will still be the fact for both the Baltic countries and Finland.

Thus, possible risks in gas supplies are primarily related to securing of heat supply. Most important is the district heating system of Tallinn that requires at least 2 000 thousand m³ daily without electricity generation in Iru Power Plant and 2 700 thousand m³ daily together with electricity production.

The largest gas consumer in Estonia is Iru Power Plant that belongs to *Eesti Energia AS* and supplies district heat to the city of Tallinn. There are two cogeneration blocks installed in the plant, with capacities of 180 and 220 MW (altogether 400 MW) respectively and three hot water boilers with a total capacity of 348 MW. *AS Tallinna Küte* (the heat supply undertaking) has purchased from Iru Power Plant a heating capacity of 435 MW and this has been the basis for approval of the tariff of heat sold to customers. In order to supply this capacity at least one of the cogeneration blocks has to run. In possible crisis situation involving gas supply disturbances the plant can reduce gas consumption by switching over to heat only boilers. In such solution a maximum gas consumption shall be 1 000 m³ daily. Besides, the plant can also switch over to using of liquid fuel, as it has storage tanks with a total volume of 60 000 tons. In above described load situation the daily consumption would be 770 tons. Therefore, the storage volume is far enough for ensuring heat supplies.

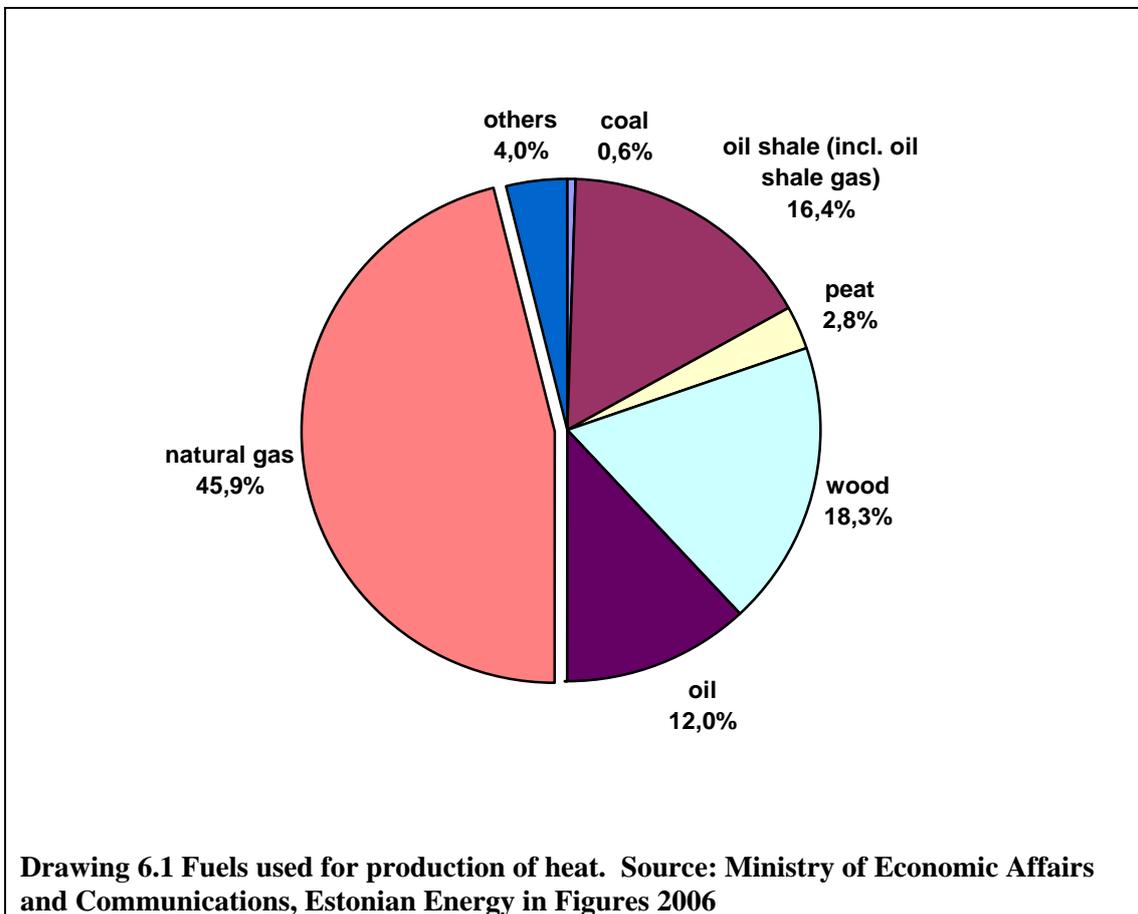
The Estonian peak of gas consumption without *AS Nitrofert* is 6 000 thousand m³ daily. Since it is possible to get from the Latvian gas storage 5 000 thousand m³ daily as maximum, then in a crisis situation rest can be covered through switching over the Tallinn heat supply to burning of fuel oil. That would decrease the Estonian gas consumption down to 3 300 thousand m³ daily.

In conclusion the EMI is in a position that gas supply risks are related to the supply from a single source - Russia. However, technically it is impossible to stop all gas supplies to Estonia, as in the period of consumption peak most gas is supplied from the Latvian gas storage. In addition it should be considered that in a crisis situation it is possible to limit gas consumption almost two times (stoppage of electricity production, switching over the Tallinn heat supply to a reserve fuel). A combination of those measures can ensure gas supplies to all other customers.

6. Review of district heating sector

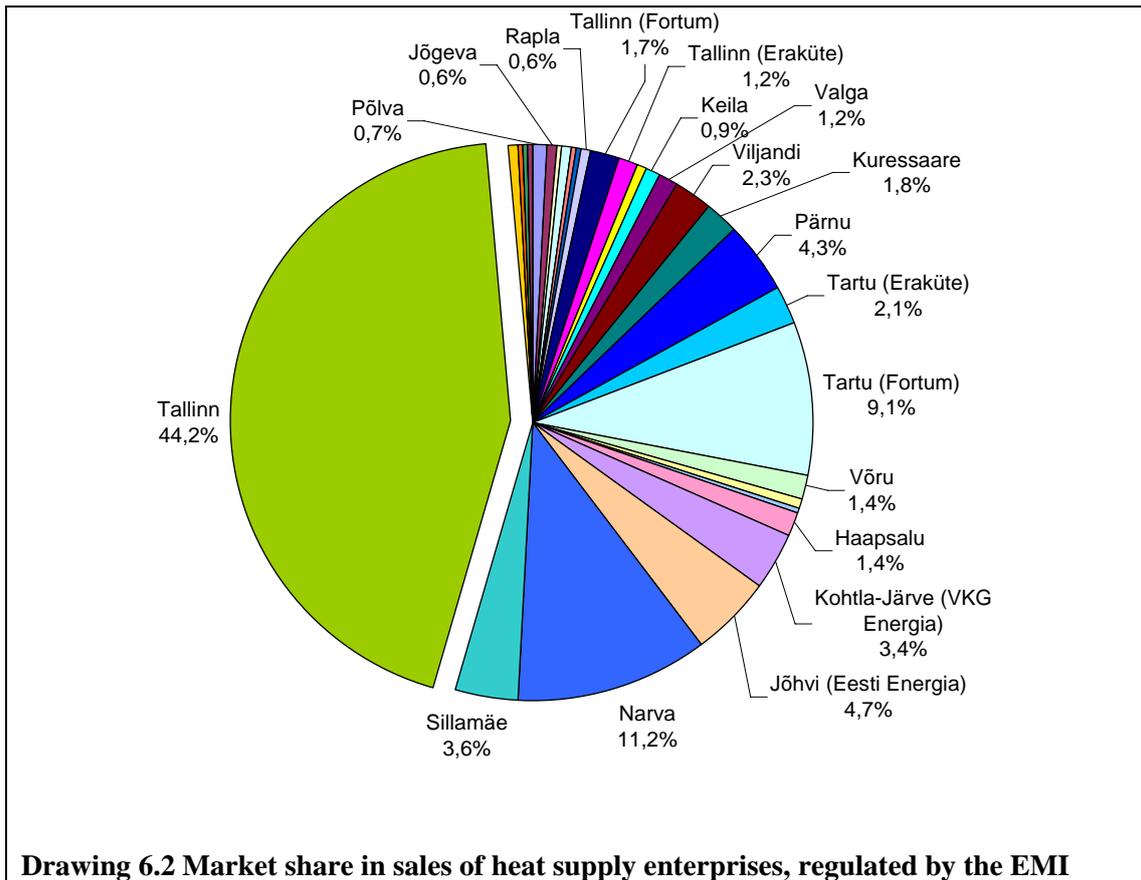
In Estonia district heating plays an important role in heat supply, as the share of district heating in total heat supply is 70 per cent. Moreover, expenses for heating form the biggest part of residential cost of households. That is why the formation of tariffs for heat is crucial.

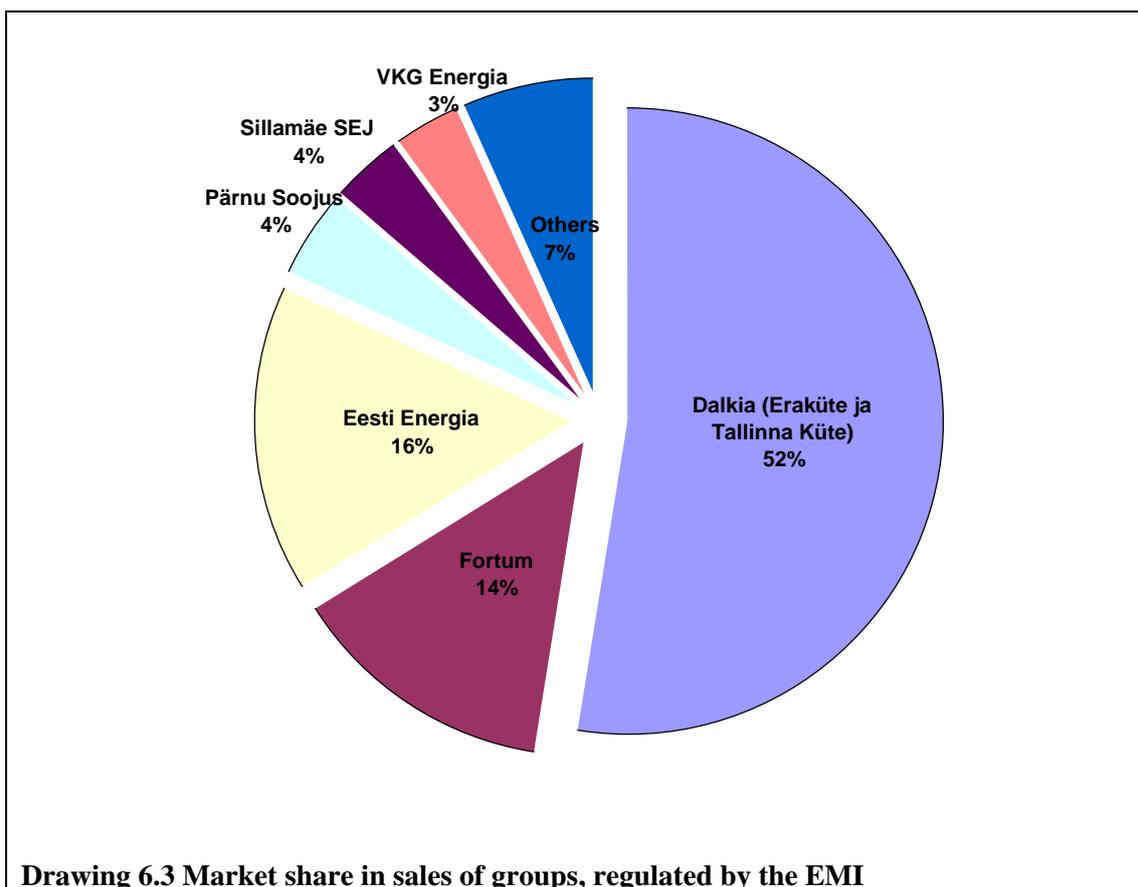
To a large extent heat is produced in boiler plants, the share of cogeneration is 30,3 per cent. Drawing 6.1 below presents the share of fuels used for heat production. As seen on the drawing, natural gas has the biggest share of 45,9 per cent, followed by wood and oil shale (together with oil shale retorting gas), respectively 18,3 and 16,4 per cent. The share of oil is relatively modest, only 12 per cent, whereas it has been decreasing. For instance, in 2001 the share of oil in heat production was even 17,6 per cent. So it makes once again sense to emphasise that natural gas has an important role to play in the supply of heat for Estonia.



In accordance with the District Heating Act the tariffs for heat are approved either by the EMI or by local municipal authorities. The tariffs are approved separately for all district heating network areas. The EMI approves tariffs if an annual sale of heat per undertaking or per a group exceeds 50 000 MWh, while for other undertakings tariffs are approved by local municipalities. In 2006 the Ministry of Economic Affairs and Communications carried out a study in the result of which it was revealed that the number of individual district heat supply undertakings in Estonia is close to 200. For 40 of them tariffs are approved by the EMI, while for others by local municipalities.

As many groups acting in Estonia own also small district heating undertakings, then besides largest enterprises like Tallinn, Tartu, Narva and Pärnu the EMI approves tariffs also for many very small enterprises. However, the role of local municipalities in tariff approval cannot be undervalued, as to the majority of undertakings tariffs are approved just by local municipalities. Drawing 6.2 below presents market share of the undertakings for which the EMI approves tariffs, while in drawing 6.3 there are shares of various groups. The biggest group is Dalkia with its 52 per cent market share. Dalkia owns *AS Tallinna Küte* and *AS Eraküte*, which in turn possess a number of heat supply undertakings. The next largest are *Eesti Energia AS* and *Fortum*.





Heat supply enterprises are regulated similarly to electricity and gas enterprises. The main tariff components are fuel cost, operational cost (maintenance, repair, labour, administrative and other costs), depreciation of fixed assets and profit. The regulation of heat tariffs is very simple, as practically all enterprises are using a single component tariff. Therefore, the tariff in kroons per MWh is calculated by division of the amount of cost components by sale volume. Thus, the tariff for heat is formed by the following simple equation:

$$\text{tariff}_{\text{heat}} = \frac{\text{cost}_{\text{fuel}} + \text{cost}_{\text{operation}} + \text{depreciation} + \text{profit}}{Q_{\text{sale}}}$$

tariff_{heat} – tariff for heat kr/MWh

cost_{fuel} – fuel cost

cost_{operation} – operational cost

depreciation – depreciation of fixed assets

profit – operational profit

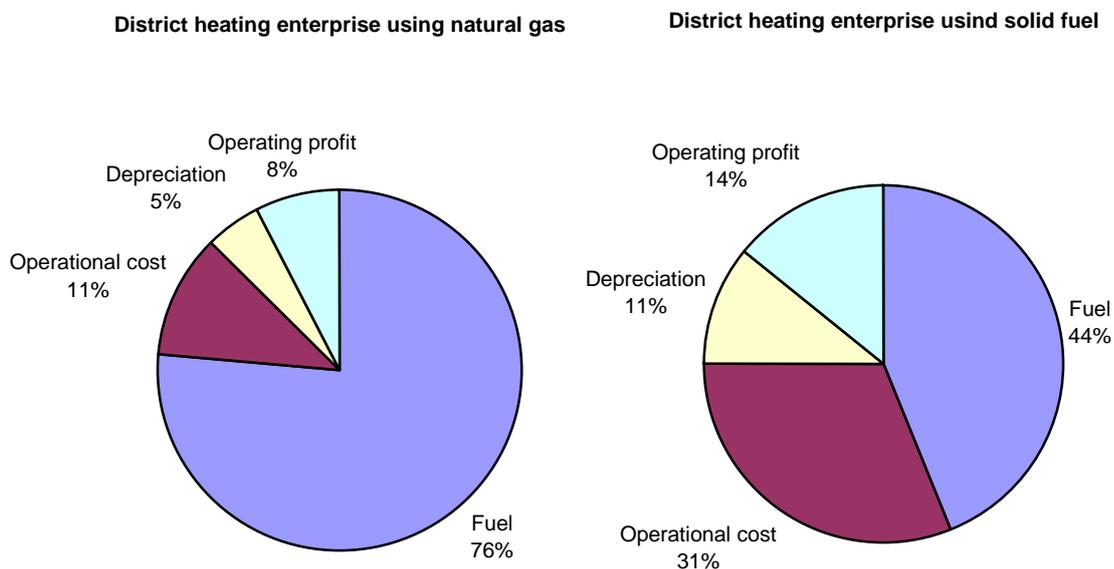
Q_{sale} – quantity of sold heat MWh

So the tariff for heat comprises four cost components, which are fuel, operating cost, depreciation of fixed assets and operating profit. The enterprises regulated by the EMI can be divided into three categories. The enterprises located in Ida-Viru county (north-east Estonia) primarily use oil shale. Those are Narva, Jõhvi, Kohtla-Järve and Sillamäe. The second category is enterprises that use natural gas: Tallinn, Rapla, Põlva, Jõgeva and some others. The third category facilities use local solid and

biomass fuel (peat and wood) partially supported by gas or liquid fuel: Tartu, Viljandi, Haapsalu, Keila and others.

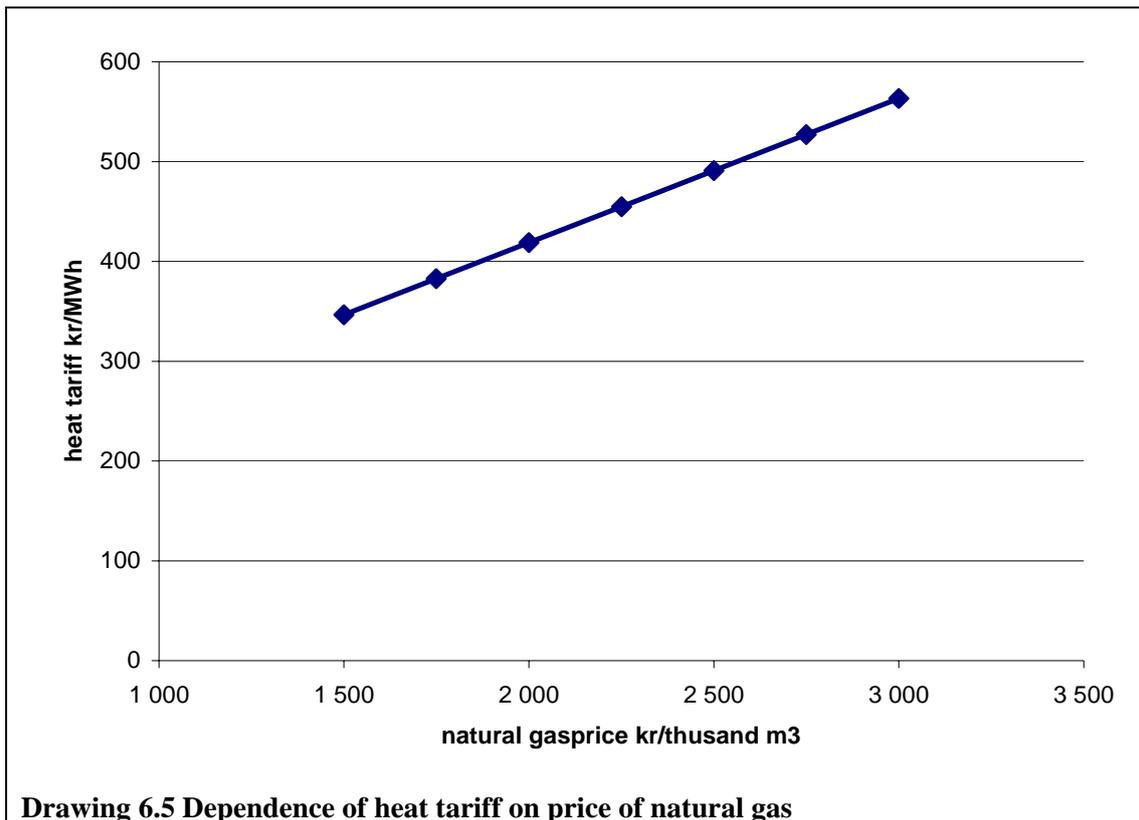
A tariff for heat first of all depends on the fuel used. The lowest tariffs are in those enterprises that use oil shale, being within the range of 300 and 400 kroons per MWh. The highest is tariff in undertakings that use only natural gas, ranging between 550 and 650 kroons per MWh. And finally, those using local solid fuel have tariffs in the range of 500 and 600 kroons per MWh.

The fuel used determines also the structure of cost components. For comparison, table 6.4 below presents the structure of cost components in two different enterprises. One of them uses only natural gas, while the other one uses local fuel. As appears from the drawings, in an enterprise using natural gas the most important cost component is the fuel, while in case of solid fuel usage fixed cost plays the biggest role: operational cost, depreciation and operational profit.



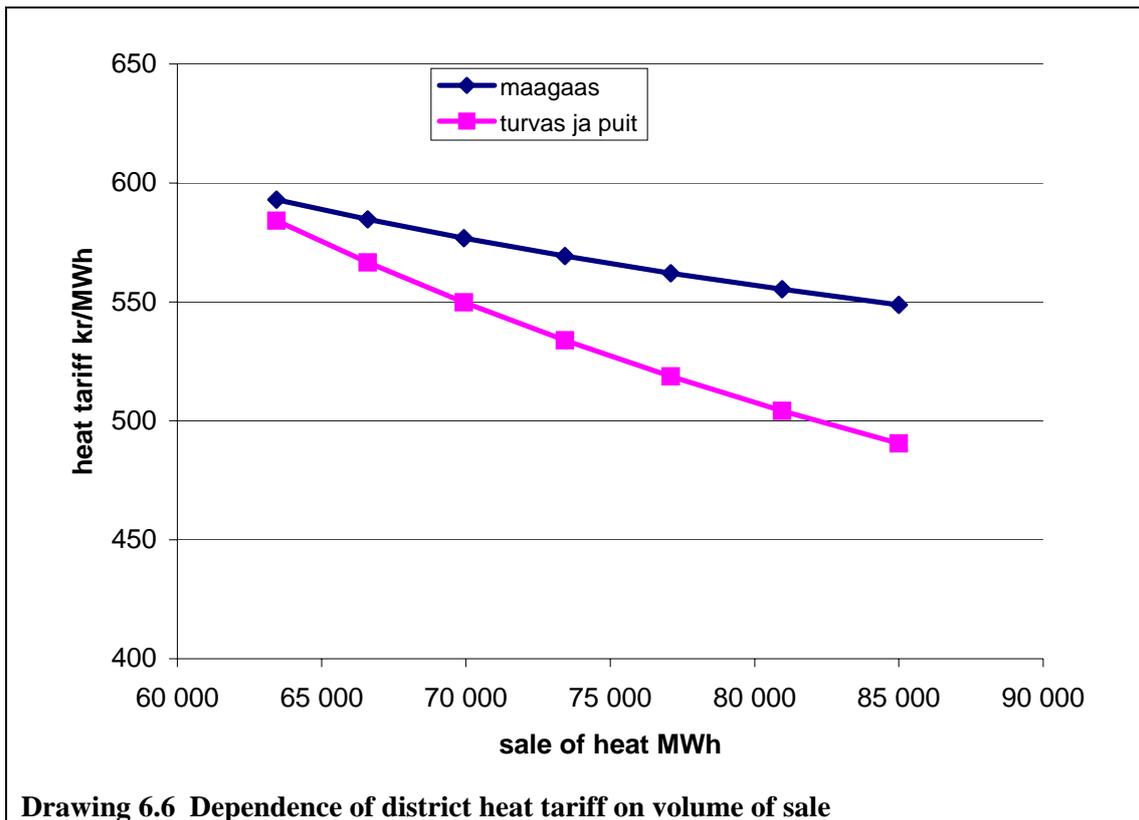
Drawing 6.4 Structure of district heat tariffs

For above described reasons the tariffs of enterprises using solid fuel is much more stable. Although the solid fuels follow general price tendency and are influenced by inflation there is still no direct dependence on the price of oil on the world market. Whereas the natural gas prices directly depends on the latter and that is why district heat customers are influenced by general world market price level. Drawing 6.5 below compares the formation of heat price in changing gas price conditions. The solid fuel price is left unchanged at an assumption that there is no dependence on the world market prices. It can be concluded from the drawing that customers may benefit from lower gas price but when the price go up a steep increase in heat tariff can be expected as well.



The District Heating Act does not stipulate fuels that are to be used by heat supply enterprises, whereas the Act still stipulates that activities of an undertaking shall base on principles, which ensure reliable, effective, at a justified price and environmentally friendly supply of heat that corresponds to the needs of customers. Due to that the enterprises have chosen different fuels. Until 2005 the tariffs were cheapest for enterprises that have used natural gas. In 2006 a steep increase of gas price reversed the situation. Therefore it can be concluded that investments into utilisation of local fuels have been justified. In addition to more favourable tariff today those customers can also enjoy stability of tariffs.

An important factor in the formation of heat tariff is the volume of sales. The higher the volume the more favourable the tariff. The cost fuel is a variable cost while the fixed cost components (operational cost, depreciation and operating profit) remain unchanged, irrespective whether sales is increasing or decreasing. As seen on drawing 6.4 above the fixed cost of an enterprise using solid fuel (peat and wood) is as high as 56 per cent of the tariff. Thus, for such enterprise the tariff is especially highly dependent on sale volume. In case of gas the share of fixed cost is only 24 per cent. And that is why the dependence on sale volume is lower. Drawing 6.6 below presents dependence of tariffs on the volume of sales. As explained above it is much higher in the enterprises that burn peat and wood in their boiler plants.



As tariffs are approved according to calculations submitted by enterprises, the volume of sale is a matter of predicting the future. In the analysis of the prognoses the EMI has based on the actual volumes of previous years and considered also potential new customers. Unlike electricity consumption the consumption of heat is not linked to an economic growth. On the basis of statistic data it can be concluded that electricity consumption forms approximately half of a growth in economy. For instance, if an economic growth is 6 per cent then a typical growth in the consumption of electricity is approximately 3 per cent. In Estonia the relationship is well in compliance with that assumption. But in the consumption of heat such proportions are not present. Firstly, because heat consumption primarily depends on weather conditions and secondly, there is quite good potential for energy savings. In the Energy Conservation Programme prepared by the Ministry of Economic Affairs and Communications the saving potential is evaluated be 20 to 30 per cent of the current consumption level. As regards enterprises analysed by the EMI, a decrease in heat consumption was observable between 2000 and 2002. In connection with the general economic growth since 2004 a slight increase in consumption has taken place as well. However, the level of it is not higher than 1-2 per cent. A reason of that has been connecting of new customers and probably also stoppage of the limitation of consumption at the cost of living conditions. Since expenses for heating form the highest share of residential cost, heat has been saved at the cost of comfort. This means that the temperature in living rooms was just kept too low.