

# **National Development Plan of the Energy Sector until 2020**

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## Introduction

In the current century several processes have taken place in the world power industry which have also influenced significantly the development of the Estonian energy sector. The increase of fuel prices on the world markets, gradual liberalisation of energy markets, activation of EU emission trading, worsening of energy supply problems, rising of energy security issues and rapid development of renewable energy have altered also the Estonian energy market to a significant extent.

The energy sector trends approved by the European Council provide long-term guidelines for the development of the sector in the European Union. The objective set for 2020 is to achieve a 20 % reduction of greenhouse gas emissions compared to 1990 and a 30% reduction, if other big industrialized countries join the initiative. Another objective established was to increase the share of renewable energy sources up to 20% in energy consumption and the share of biofuels up to 10 % in transport fuels provided that second-generation biofuels are developed successfully. The aim is also to achieve a 20% reduction in energy consumption by 2020.

By now Estonia has reduced emissions of greenhouse gases more than 50% compared to 1990; the share of renewable energy sources formed 18% in total energy consumption in 2005. The use of biofuels in Estonia is low at present, but interest in the use of biofuels is increasing constantly. Final energy consumption is somewhat increasing due to economic growth, but at a much slower pace than economic growth.

Heat consumption and heat and electricity losses have decreased to a considerable extent in the Estonian energy system as a whole thanks to investments in energy efficiency. Regardless of extremely rapid economic growth, the consumption of primary energy has started to decrease in Estonia. This is supported, among other things, by the decrease in the export volumes. The volume of energy demand in the Estonian economy has decreased to a considerable extent in the last five years. The potential of energy efficiency in the energy system as a whole is approximately 20%, for the gradual achievement of which an energy conservation programme has been prepared as an implementing plan of this development plan.

The submarine cable Estlink put into operation in 2007 connected the electricity markets of the Baltic States with the electricity markets of the Nordic countries. Several new renewable electricity plants and cogeneration stations, which increase significantly the efficiency of the Estonian energy system, are under construction. Cooperation has been started between undertakings for the development of the projects of the new nuclear power plant in Lithuania; possibilities to participate in the construction of the 6th nuclear reactor in Finland have been studied. Preliminary work is carried out for further renovation of Narva Power Plants. Storage technologies for shale oil production waste have been developed; preliminary work is carried out for the construction of new shale oil production equipment. There is an increasing interest in the world in the Estonia's experience in the production of shale oil.

The supply problems which arose in January 2006 gave a sign of the bottlenecks of the existing gas system upon growing demand and in extraordinary weather conditions. The prices of liquid fuels, natural gas and wood fuels have also increased considerably, which is mainly due to steep increase in demand in the world's and regional fuel markets.

Great challenges in the next few years are connected with the development of the electricity markets of Estonia and the Baltic States. The prohibition to use the old units of Narva Power Plants shall be applied as of 2016 and closing of the reactors of Ignalina nuclear power plant in 2009 will require significant investments in the electricity sector, the development of electricity markets requires adequate market regulation in all the three Baltic States. The development plan of the electricity sector shall be prepared in order to solve the essential problems of this sector. The aim of the National Development Plan of the Energy Sector is to combine the specific development plans of the sector and to set the general objectives of energy policy until 2020.

Pursuant to subsection 10 (2) of the State Budget Act and in compliance with Regulation No 302 of the Government of the Republic of 13 December 2005 “Types of Strategic Development Plans, the Procedure for Their Preparation, Amendment, Implementation and Evaluation and Reporting Procedure”, the Government of the Republic approved, by Order No 13 of 10 January 2008, the preparation of the Development Plan of the Energy Sector and appointed the Ministry of Economic Affairs and Communications as a ministry responsible for and the Ministry of the Environment, the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Social Affairs, the Ministry of Education and Research and the Ministry of Agriculture as the ministries participating in the preparation of the Development Plan.

As an essential national issue the Development Plan of the Energy Sector is subject to approval in the Riigikogu pursuant to subsection 12 (6) of the Sustainable Development Act. The implementing plan of the Development Plan of the Energy Sector prepared at present for the years 2009–2012 shall be approved by the Government of the Republic after approval of the Development Plan in the Riigikogu.

A working group was formed for the preparation of the Development Plan of the Energy Sector by directive No 3 of the Ministry of Economic Affairs and Communications of 18 January 2008, the objective of which was to prepare a development plan and an implementing plan.

An obligation was imposed on the working group to submit the working version and the final report of the Development Plan of the Energy Sector to the organising committee for power engineering and for the preparation of power engineering development plans formed by directive No 17 of the Ministry of Economic Affairs and Communications (hereinafter „committee”; chairman of the committee: Enari Kisel, Deputy Secretary General for Energy of the Ministry of Economic Affairs and Communications) for review on 22 January 2008.

In order to involve all the interest groups, the Ministry of Economic Affairs and Communications organised a series of public energy forums in order to involve the representatives of all the interest groups in the process of the preparation of the development plan for making proposals, defining the objectives and courses of action, consulting with each other and for answering or discussing the arisen questions.

Upon the preparation of the Development Plan of the Energy Sector, a strategic environmental assessment of the Development Plan of the Energy Sector was initiated on the basis of clause 33 (1) 1) and subsection 35 (2) of the Environmental Impact Assessment and Environmental Management System Act. The Environmental Board approved the strategic environmental assessment by letter No 6-8/3061 dated 26 February 2009 and the corresponding report has been annexed to the Development Plan.

# 1. Bases for Development Plan

The energy sector is regulated by the following legislation:

## 1. Sustainable Development Act<sup>1</sup>

The Sustainable Development Act provides for the basis of the national strategy of sustainable development and the basis of sustainable use of natural resources. The objective of the sustainable use of the natural environment and natural resources is to ensure living environment which satisfies the people and the resources required for the development of economy without causing substantial damage to the natural environment and by maintaining natural diversity. In the geographical and industrial sectors where the contamination of the natural environment and the use of natural resources are likely to disrupt natural balance or endanger the maintenance of biodiversity, the development is directed on the basis of a development plan initiated by the state. A development plan shall be prepared for directing the development of energy, transport, agriculture, forestry, tourism and chemical, building materials and food industries.

## 2. Electricity Market Act<sup>2</sup>

The Electricity Market Act regulates the generation, transmission, sale, export, import and transit of electricity and the economic and technical management of the power system. The Act prescribes the principles for the operation of the electricity market based on the need to ensure an effective supply of electricity at reasonable prices and meeting environmental requirements and the needs of customers, and balanced, environmentally clean and long-term use of energy sources.

## 3. Natural Gas Act<sup>3</sup>

The Natural Gas Act regulates the activities related to the import, transmission, distribution and sale of natural gas by way of gas networks, and connection to networks. The abovementioned activities shall be co-ordinated and conform to the principles of objectivity, equal treatment and transparency in order to ensure a secure, reliable and effective gas supply at a justified price in compliance with environmental requirements and the needs of the final customer.

## 4. District Heating Act<sup>4</sup>

The District Heating Act regulates the activities related to the production, distribution and sale of heat by way of district heating networks and connection to networks. The abovementioned activities shall be co-ordinated and conform to the principles of objectivity, equal treatment and transparency in order to ensure a secure, reliable and effective heat supply at a justified price in compliance with environmental requirements and the needs of the final customer.

## 5. Liquid Fuel Act<sup>5</sup>

The Liquid Fuel Act provides, for the purpose of guaranteeing the accrual of fuel excise duty and the quality of more widely used motor fuels, the bases and procedure for handling of liquid fuel, liability for the violation of this Act and organisation of exercise of state supervision. The technical and safety requirements for equipment, construction works and measuring instruments used in the handling of liquid fuel are not regulated by the Liquid Fuel Act.

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<sup>1</sup> Sustainable Development Act <https://www.riigiteataja.ee/ert/act.jsp?id=874359>

<sup>2</sup> Electricity Market Act <https://www.riigiteataja.ee/ert/act.jsp?id=12894671>

<sup>3</sup> Natural Gas Act <https://www.riigiteataja.ee/ert/act.jsp?id=12894929>

<sup>4</sup> District Heating Act <https://www.riigiteataja.ee/ert/act.jsp?id=12894819>

<sup>5</sup> Liquid Fuel Act <https://www.riigiteataja.ee/ert/act.jsp?id=12895249>

## 6. Liquid Fuel Stocks Act<sup>6</sup>

This Act provides the bases for the establishment, maintenance and holding of compulsory liquid fuel stocks. Liquid fuel stocks means the quantities of petroleum products determined by this Act and at the disposal or under the control of the state, which are established in order to ensure national security and the survival of the population of the state, to perform obligations assumed under international agreements relating to the supply of energy and fuel, and to prevent an adverse effect on economic activities or to mitigate the effect of disturbances in the event of disturbances in the supply of petroleum products.

## 7. Energy Efficiency of Equipment Act<sup>7</sup>

The Energy Efficiency of Equipment Act regulates the requirements for the energy efficiency and energy labelling of certain types of household appliances, heating equipment and installations, registration of equipment and counselling upon the replacement thereof and the bases of and procedure for their conformity assessment and attestation in order to increase the efficiency of the consumption of energy and other essential resources.

In addition to sector-specific regulation, the development of the energy sector is significantly affected by environmental legislation.

## 1.1. Definitions

**"bioenergy"** means part of renewable energy, which in its turn is part of total energy. Bioenergy is defined as energy produced from biomass – heat, electricity and biofuels;

**"biofuels"** means liquid or gaseous fuel for transport: bioethanol, biodiesel, biogas, biomethanol, biomethylether, bio-ETBE, bio-MTBE, synthetic biofuels, biohydrogen and pure vegetable oil (based on Article 2.2. of Directive 2003/30/EC of the European Parliament);

**"biomass"** means the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste;

**"power system"** means the technical system for the generation and transmission of electricity, which is comprised of power plants located within the territory of Estonia, the network which connects the power plants to one another as well as customers and the power systems of other countries, and the corresponding control, protection and communication systems;

**"reliability of a power system"** means the ability of the power system to ensure joint operation of power plants and power networks in the operation of the power system;

**"import of electricity"** means the import of electricity from outside the system with the aim of selling or consuming electricity in Estonia;

**"energy efficiency"** means an indicator characterising the efficient consumption of energy and other essential resources upon the normal use of equipment;

**"district heating"** means the production of heat and the distribution thereof through a network with the aim of supplying final customers with heat by way of district heating systems;

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<sup>6</sup> Liquid Fuel Stocks Act <https://www.riigiteataja.ee/ert/act.jsp?id=12794210>

<sup>7</sup> Energy Efficiency of Equipment Act <https://www.riigiteataja.ee/ert/act.jsp?id=12742155>

**"district heating region"** means an area determined by a comprehensive plan within which consumer installations are provided with heat by way of district heating in order to ensure a secure, reliable and effective heat supply at a justified price in compliance with environmental requirements and the needs of the final customer;

**"fluidised bed boiler"** means a boiler in which the milling coal is maintained in suspension by a rising current of air during combustion;

**"primary energy"** means energy obtained from a natural source and consumed without transformation into other forms of energy. From the fuel produced in Estonia this includes oil shale, peat, firewood, wood waste and biogas and from the imported fuel this includes coal, natural gas, liquid gas, heavy fuel oil, light heating oil, diesel fuel, motor vehicle petrol and aviation kerosene;

**"renewable energy sources"** means water, wind, solar, wave, tidal and geothermal energy sources, landfill gas, sewage treatment plant gas, biomass;

**"renewable energy"** means energy generated from non-fossil energy sources such as wind energy, solar energy, wave energy, hydropower, tidal energy, geothermal energy, bioenergy, landfill gas, sewage treatment plant gas;

**"renewable electricity"** means electricity generated from non-fossil energy sources such as wind energy, solar energy, wave energy, hydropower, tidal energy, geothermal energy, bioenergy, landfill gas, sewage treatment plant gas;

**"operational security"** means the capability of a power network to operate under normal conditions without interruption during a specific period of time;

**"security of supply"** means the capability of a system to ensure the required high-quality electricity supply to customers during a certain period of time;

**"liquid fuel"** means a liquid flammable substance which can be used as the source of energy for heat engines and other energy conversion devices suitable for such purposes, or liquefied petroleum gas used in motor vehicles which is gaseous under standard conditions, that is, at a pressure of 0.1 MPa and a temperature of 15 °C;

**"network operator"** means an undertaking which owns or possesses a power line or network, a heating pipeline or network, a gas pipeline or network, or a liquid fuel pipeline or network through which electric power, heat, network gas or liquid fuel is transmitted, transported or distributed;

**"network losses"** means power losses in the distribution network elements.

## 1.2. Relations with Other Development Strategic Documents

The Development Plan of the Energy Sector is the basis for the development plans of the electricity, oil shale, biomass and bioenergy sectors (Diagram 1) and the energy conservation target programme concerning energy conservation issues:

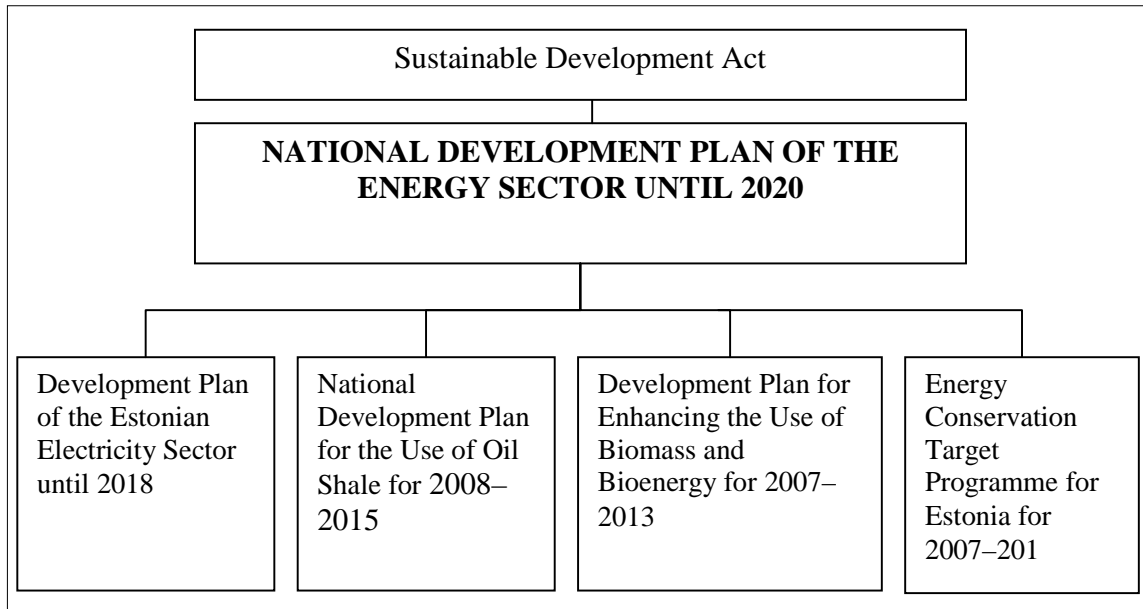


Diagram 1. Relations of the Development Plan of the Energy Sector with other development plans

**a. The Development Plan of the Estonian Electricity Sector until 2018<sup>8</sup>** sets the strategic objectives for the development of the electricity sector within ten years by describing the objectives and the measures for the achievement thereof with regard to guaranteeing power supply, reduction of the burden on the environment, creation of international energy links, opening of the electricity market and increase of electricity consumption. The same objectives are of significant importance also in this Development Plan of the Energy Sector.

**b. The National Development Plan for the Use of Oil Shale for 2008–2015<sup>9</sup>:** the strategic objective of the plan is to ensure supply of Estonia with oil shale energy and to guarantee the energetic independence of Estonia. In addition, the development plan raises the issues for finding possibilities in the longer term for gradual reduction of the annual volume of the use of oil shale up to the volume of 15 million tons a year by 2015. The strategic objective set out in the Development Plan for the Use of Oil Shale to increase the efficiency of the use and extraction of oil shale supports the objective of the Development Plan of the Energy Sector to ensure sustainable energy supply and consumption in Estonia. The National Development Plan for the Use of Oil Shale for 2008–2015 was approved by the resolution of the Riigikogu of 21 October 2008<sup>9</sup>.

<sup>8</sup> Development Plan of the Estonian Electricity Sector until 2018 <http://www.mkm.ee/index.php?id=321328>

<sup>9</sup> National Development Plan for the Use of Oil Shale for 2008–2015 <http://www.envir.ee/232764>

**c. The Development Plan for Enhancing the Use of Biomass and Bioenergy for 2007–2013<sup>10</sup>:** the objective of the plan is to create favourable conditions for the development of the production of domestic biomass and bioenergy in order to decrease the dependence of Estonia on imported resources and fossil fuels and to reduce pressure on the natural environment. The objective of the development plan is to reduce the dependence of Estonia on imported energy resources and to enhance the use of biomass as a raw material for energy which coincides with the objective of the Development Plan of the Energy Sector to guarantee continuous energy supply by diversification of energy sources and more even distribution in the energy balance.

**d. The Energy Conservation Target Programme for 2007- 2013<sup>11</sup>** defines the targets for saving fuel and energy in Estonia for 2007-2013 and establishes the measures required for achieving the targets. The objective of the programme is to ensure more efficient use of fuels and energy in Estonia, which is of significant importance for the achievement of the objectives of the Development Plan of the Energy Sector in the areas of energy conservation and energy efficiency.

In addition to the documents listed above, the Development Plan is related to the following strategic documents:

**e. The Estonian National Programme for Reduction of the Emission Levels of Pollutants Released into Ambient Air by Stationary and Mobile Sources of Pollution for 2006–2015<sup>12</sup>** (draft), covers the possible ways of reduction of emission levels of pollutants in 2006–2015. The measures and activities planned in this Development Plan of the Energy Sector contribute to the objective provided for in the abovementioned programme upon reduction of the emission levels of pollutants released into ambient air.

**f. The Estonian Research and Development and Innovation Strategy 2007-2013 “Knowledge-based Estonia”<sup>13</sup>** focuses on the sustainable development of the society through research, development and innovation, which contributes to the achievement of the objectives of the long-term Estonian strategy on sustainable development "Sustainable Estonia 21". The strategy focuses, among other things, on the preferential development of the energy sector by launching the national research and development programme (National Energy Technology Programme – ETP). In order to achieve the objective of sustainable research and development established in the strategy, measures have been planned in the Development Plan of the Energy Sector for obtaining knowledge in nuclear energy and for the promotion of education and research in the energy sector.

**g. The Estonian Energy Technology Programme<sup>14</sup>** sets out the priorities related to the energy sector and provides systematic information to the decision-makers for making decisions related to energy. The priorities of the Energy Technology Programme are oil shale technologies and new energy technologies based mainly on renewable energy sources. The implementation of the

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<sup>10</sup> Development Plan for Enhancing the Use of Biomass and Bioenergy for 2007–2013  
<http://www.agri.ee/index.php?id=11014>

<sup>11</sup> Energy Conservation Target Programme for 2007- 2013 <http://www.mkm.ee/index.php?id=352791>

<sup>12</sup> Draft Estonian National Programme for Reduction of Emission Levels of the Pollutants Released into the Ambient Air by Stationary and Mobile Sources of Pollution for 2006–2015 <http://www.envir.ee/462236>

<sup>13</sup> Estonian Research and Development and Innovation Strategy 2007-2013 “Knowledge-based Estonia”  
<http://www.hm.ee/index.php?03242>

<sup>14</sup> Estonian Energy Technology Programme <http://www.hm.ee/index.php?03242>

programme enables to obtain a better overview of the use of the financial funds allocated for the energy sector, decrease duplication and improve cooperation between the ministries in the field of energy. The Estonian Energy Technology Programme is closely connected with the biotechnology programme under preparation, the objective of which is to map the development potential and different activities in the Estonian biotechnology sector and to coordinate common objectives and activities. The biotechnology sector is directly connected with the creation of competitive biofuels (creation of economically expedient production potential for second-generation biofuels).

**h. The Estonian Environmental Strategy until 2030**<sup>15</sup> provides for the objective of the energy sector to produce electricity in an amount, which satisfies the consumption needs in Estonia, and to develop versatile, sustainable production technologies based on different energy sources and with little environmental load, which enable to produce electricity also for export. Based on the objectives set out in the environmental strategy, measures have been planned in the Development Plan of the Energy Sector for the development of energy technologies in the forthcoming years.

**i. The Estonian Environmental Activity Plan for 2007-2013**<sup>16</sup> (Implementing Plan of the Estonian Environmental Strategy until 2030): the objective is to slow down and stabilise the consumption of energy, while ensuring that the needs of people are met, i.e. to ensure prevention of the increase of the share of primary energy upon increase of consumption.

**j. The Estonian National Strategy on Sustainable Development "Sustainable Estonia 21"**<sup>17</sup> supports in general the increase of the production of energy based on renewable natural resources by developing preferentially and supporting activities which promote energy conservation. These objectives are also reflected directly in the Development Plan of the Energy Sector, the aim of which is to ensure continuous, efficient, sustainable energy supply and consumption at a justified price in Estonia.

**k. The Estonian Housing Development Plan for 2008–2013**<sup>18</sup> provides measures for the improvement of energy conservation in apartment buildings and for raising awareness in order to improve the housing stock, which is of significant importance upon achieving the objectives of the Development Plan of the Energy Sector in the area of energy conservation.

**l. The Estonian Action Plan for Economic Growth and Employment for 2008- 2011**<sup>19</sup> establishes the objective of the energy sector to ensure security of supply of energy, to develop environment-friendly power engineering and to increase energy efficiency. For Estonia the key issues are increase of ecological compatibility of oil shale power industry, increase of the share of renewable energy and improvement of energy efficiency. The increase of energy efficiency contributes to environment-friendly power engineering (more efficient energy consumption – smaller environmental impact) and the increase of security of supply (smaller energy consumption – smaller need for imported energy). The objectives of the abovementioned plan coincide with the objectives of the Development Plan of the Energy Sector with respect to security of energy supply and energy efficiency.

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<sup>15</sup> Estonian Environmental Strategy until 2030 <http://www.envir.ee/1045989>

<sup>16</sup> Estonian Environmental Activity Plan for 2007-2013 <http://www.envir.ee/1045989>

<sup>17</sup> Estonian National Strategy on Sustainable Development "Sustainable Estonia 21" <https://www.riigiteataja.ee/ert/act.jsp?id=940717>

<sup>18</sup> Estonian Housing Development Plan for 2008- 2013 <http://www.mkm.ee/index.php?id=345312>

<sup>19</sup> Estonian Action Plan for Economic Growth and Employment for 2008- 2011 <http://www.riigikantselei.ee/?id=5864>

**m. The National Strategic Reference Framework for the EU Structural Funds for 2007-2013**<sup>20</sup> establishes an objective to use energy more efficiently which would enable to prevent potential shortage of energy in future and thus provide international competitive and security advantages for the state in the longer run. According to the implementation plan for the development of housing the following areas shall be supported within the framework of the priority axis of the development of the energy sector: 1) more extensive use of renewable energy sources; 2) use of alternative energy sources in transport; 3) ambient air protection and mitigation of climate changes; 4) development of energy conservation in housing (including informing the residents of the possibilities of energy conservation in residential buildings). The development trends provided for in the strategy are also reflected in the measures of the Development Plan of the Energy Sector for diversification of energy supplies.

**n. The Bases of the Security Policy of the Republic of Estonia (2004)**<sup>21</sup> brings out the strong linkage of Estonian gas and power systems with the monopolistic energy systems and energy suppliers outside Estonia as a significant risk factor. On the basis of the foregoing, the construction of new energy connections in the Member States of the European Union has been planned in the Development Plan of the Energy Sector.

**o. The United Nations Framework Convention on Climate Change**<sup>22</sup> and **Kyoto Protocol ratified in October 2002**<sup>23</sup>, the objective of which is to reduce greenhouse gas emissions during the years 2008-2012. The protocol establishes an objective for Estonia to reduce greenhouse gas emissions by 8% compared to the reference level of 1990. In connection with this the National Development Plan for the Reduction of Greenhouse Gas Emissions is being updated. The measures planned in this Development Plan of the Energy Sector ensure reduction of air pollution contributing to climate change.

**p. The Action Plan for Energy Policy for Europe 2007–2009** the objectives of which are increasing of security of energy supply, ensuring competitive and affordable energy in Europe and combating climate change in order to achieve environmental sustainability. Measures and activities have been planned in the Development Plan of the Energy Sector for the diversification of energy supply, the development of sustainable use of energy and implementation of new energy technologies in order to achieve the objectives established in the Development Plan.

The National Development Plan of the Energy Sector until 2020 shall be implemented through the development plans and implementing plans of different sub-sectors. The abovementioned development plans and implementing plans cover largely the measures required for the organisation of the energy sector. This plan includes additional aspects to be developed and establishes cross-sectoral objectives for efficiency gains upon use of energy.

### **1.3. Overview of the Implementation of the Development Plan of the Previous Period**

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<sup>20</sup> National Strategic Reference Framework for the EU Structural Funds for 2007-2013 <http://www.fin.ee/sf2007>

<sup>21</sup> Bases of the Security Policy of the Republic of Estonia (2004) <http://www.kmin.ee/?op=body&id=119>

<sup>22</sup> United Nations Framework Convention on Climate Change <http://www.riigiteataja.ee/ert/act.jsp?id=24655>

<sup>23</sup> Kyoto Protocol ratified in October 2002 <https://www.riigiteataja.ee/ert/act.jsp?id=760682>

The currently valid Long-term Public Fuel and Energy Sector Development Plan until 2015 approved by the Riigikogu on 15 December 2004 (hereinafter "development plan of the previous period") gives an overview of the situation of the fuel and energy sector, establishes the strategic objectives and the principles for the development thereof, the development trends and the priority activities. The following table shows an overview of the objectives established in the abovementioned development plan and the achievement thereof:

**Table1. Overview of the achievement of the objectives of the development plan of the previous period**

Objective	Achievement	Achieved target value or objective, as at 2007 <sup>24</sup>
Ensuring the existence of local generating power to cover the domestic electricity consumption needs	<u>Achieved:</u> Estonia has been continuously able to cover its electricity consumption needs and has also exported electricity.	The available installed capacity of the thermal power stations is 2760 MW, the installed capacity of wind power stations and hydroelectric power stations is 58MW and 5MW respectively. The export of electricity formed 22% (2765 GWh) of the total amount of electricity generated.
Ensuring liquid fuel stocks in compliance with law	<u>Achieved:</u> In 2005 the Estonian Oil Stockpiling Agency was established, which has ensured the establishment of the fuel stocks prescribed by law through contracts and by ensuring the fuel stocks in reserve storage facilities.	Based on the data of 2007, there was 146 439 t of liquid fuel stocks in Estonia (the required 45 days' stocks is 116 507 t). The objective is to ensure 90 days' liquid fuel stocks by 2010 pursuant to the Liquid Fuel Stocks Act.
Ensuring that by 2010 renewable electricity forms 5.1 % of the gross consumption	<u>Trend towards achievement of the objective:</u> by 2006 the share of renewable electricity had increased; the estimated output of the new projects of renewable electricity production which will be completed by 2010 exceeds the established objective.	Renewable electricity formed approximately 1.75 % of the gross consumption.
Ensuring that by 2020 the electricity produced in cogeneration stations forms 20 % of the gross consumption	<u>Trend towards achievement of the objective:</u> The cogeneration support schemes implemented in 2007 have facilitated the construction of new cogeneration stations; the share of cogeneration is increasing.	12 % of the gross consumption of electric energy and 27 % of thermal energy was produced in cogeneration regime. 18 cogeneration stations were in operation.

<sup>24</sup> Upon pointing out the trend (increase/decrease), the year 2000 has been taken as the reference level (unless indicated otherwise) for the purpose of comparing with the levels indicated in the development plan of the previous period.

Objective	Achievement	Achieved target value or objective, as at 2007 <sup>24</sup>
Ensuring that, in the open market conditions, the competitiveness of the domestic market of oil shale production is preserved and its efficiency is increased, and applying modern technologies which reduce harmful environmental impact	<u>Trend towards achievement of the objective:</u> the new fluidised bed boilers completed in 2004 have reduced the environmental impact to a considerable extent; the production of shale oil has become more competitive as the prices of petroleum fuels rise.	The total amount of CO <sub>2</sub> decreased by 53% <sup>25</sup> compared to the base year 1990 (arising from the Kyoto Protocol).  The amount of the specific emissions of SO <sub>2</sub> per one unit of production (GWh) of an oil shale fired power plant decreased by 7% compared to 2005 (purification equipment and 2 power units based on CFB technology were installed.).
Ensuring compliance with the environmental requirements established by the state	<u>Trend towards achievement of the objective:</u> energy undertakings have generally complied with the established environmental requirements, but the issues related to oil shale ash generated and the increase of the use of solid waste need to be solved. In 2006, a project was commenced for the renovation of ash disposal and ash dumps from the EU Cohesion Fund. Investments are made for compliance with the environmental requirements.	
Increasing the efficiency of energy consumption in the heat, energy and fuel sectors	<u>Trend towards achievement of the objective:</u> the Estonian energy system has become more efficient; network losses have decreased clearly in the last years. However, the final consumption of energy increased.	There were 3884 TJ of thermal energy losses <sup>26</sup> , which has decreased by 20% compared to the base year. There were 4875 TJ of electric energy losses (2000: 4463 TJ). 230,318 TJ of primary energy was used in 2007, which is 17.1% more compared to 2000.
Until 2010, maintaining the volume of primary energy consumption at the level of 2003	<u>Trend towards achievement of the objective:</u> the achievement of the established ambitious objective has been very successful taking into consideration the estimated lower economic growth. This indicator depends to a significant extent on the volume of export of electricity.	In 2007, the supplies of primary energy (total consumption) were 230,318 TJ, which is 7.4% more compared to 2003 (213,220 TJ). The increase of the volume of the consumption of primary energy resulted from the increased export of electricity in 2007 (2765 GWh). In 2004, the level of 2003 was exceeded by 2.6%, in 2005 by 0.6%.
Ensuring that modern know-how and specialists are constantly available in all fields of the fuel and energy sector to promote technology development within the state and enable transfer of the modern energy technology	<u>Trend towards achievement of the objective:</u> the field of power engineering has become more popular at the universities, new specialities and areas of specialisation have been opened.	In 2008, the average competition to the specialities of power engineering at the Tallinn University of Technology was 2.2 The biggest competition 3:1 was in electrical power engineering; in the speciality of thermal power engineering the competition was 1:1. In 2000, the competition was 2.1, but the number of student places increased: in 2000, there were 40 places, in 2008 there were 114

<sup>25</sup> transmission, storage and distribution losses

Objective	Achievement	Achieved target value or objective, as at 2007 <sup>24</sup>
		places in the faculty of power engineering and 38 places in thermal power engineering in the Bachelor's studies. In 2008, there were 74 student places in the faculty of power engineering and 23 places in thermal power engineering in the Master's studies.
Establishment of preconditions for the construction of connections with the energy systems of the Nordic countries and Central European countries	<u>Trend towards achievement of the objective:</u> In 2007, Estlink was put into operation, preliminary work is carried out with respect to the gas pipeline Balticconnector between Estonia and Finland, an additional power connection Estlink 2 and a Lithuanian-Polish power connection. The prerequisite for these connections is the establishment of a favourable framework of investments.	The submarine cable Estlink has been completed.
Definition of the use of oil shale as the national strategic energy resource, including assessment of the possibilities to use shale oil and oil shale gas upon implementation of the principle of distributed energy production	<u>Achieved:</u> the National Development Plan for the Use of Oil Shale for 2008–2015 was approved by the Riigikogu on 21 October 2008.	-
Development of the tax system which integrally regulates power engineering and the environment, taking account of the impact of the implementation mechanisms of the Kyoto Protocol	<u>Ongoing process:</u> the new rates and principles of excise duties have been applied, the rates of environmental charges for the energy sector have been established by the Environmental Charges Act (entered into force 1 January 2006).	In June 2006, the new rates and principles of excise duties and the principles for the establishment thereof were applied by the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act Amendment Act. By the amendments to the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act approved in 2007 new rates of excise duty were established for motor fuels from 1 January 2008, excise duty was also imposed on natural gas and electricity.
Preparation and approval of the development plan of the electricity sector	<u>Achieved:</u> the Development Plan of the Estonian Electricity Sector 2005–2015 was approved by the Government of the Republic on 3 January 2006.	-
Development of measures to enable the use of renewable liquid fuels, in particular biodiesel, in the transport sector	<u>Partially achieved:</u> exemption from excise duty has been applied for the use of biofuels, the mandatory terms and conditions for the use of biofuels are under preparation. The Development Plan for Enhancing the Use of Biomass and Bioenergy for 2007–2013 has been approved by the Government of the Republic.	-
Preparation and approval of	<u>Achieved:</u> basic research of the	-

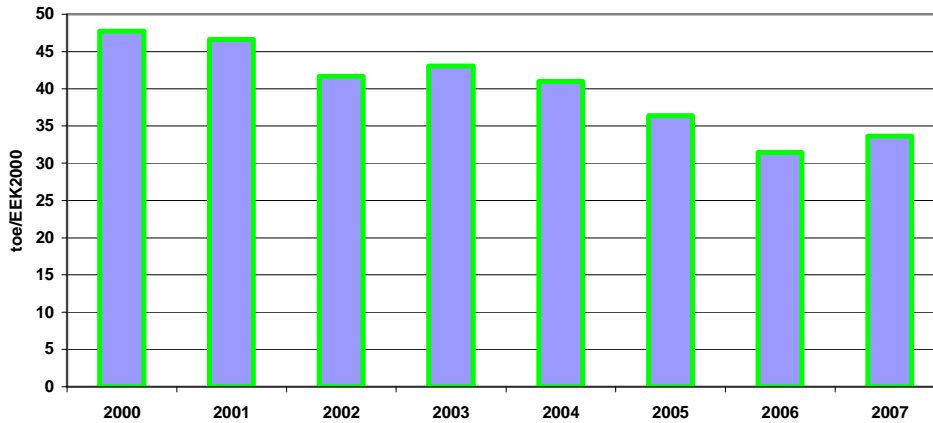
Objective	Achievement	Achieved target value or objective, as at 2007 <sup>24</sup>
the Estonian development strategy for energy technology	development strategy for energy technology has been carried out ( <i>Estonian Development Strategy of Energy Related Technologies</i> ), on the basis of which the National Energy Technology Programme was prepared and approved by the Government of the Republic on 12 December 2007.	
Development and approval of the development plan for the rationalisation of energy consumption and improvement of the efficiency of energy production and distribution and the reduction of environmental impact	<u>Achieved:</u> the Energy Conservation Target Programme for 2007- 2013 was approved by the Government of the Republic on 1 November 2007. The Environmental Activity Plan for 2007-2013, which has been prepared based on the objectives and courses of action set out in the Estonian Environmental Strategy until 2030, has been completed and was approved by the Government of the Republic on 22 February 2007.	-

## 1.4. Overview of the Situation of the Energy Sector

### 1.4.1. Statistical survey

The rapid development of economy has had an impact on the increase of energy consumption in Estonia: during the period 2000 – 2007 final energy consumption increased by 28% (GDP increased approximately by 71% during the same period). Therefore energy production has also increased continuously. 230,318 TJ of primary energy was used in 2007, which is 17.1% more compared to 2000. In order to inhibit the increase of energy consumption, it is important to increase the efficiency of the energy system and energy conservation by the end consumers, especially in the heat sector, which has the biggest potential for energy conservation. Estonian energy networks have become more efficient – thermal energy losses upon transmission, storage and distribution decreased by 20% compared to 2000. In 2007 there were 4875 TJ (2000: 4463 TJ) of electric energy losses.

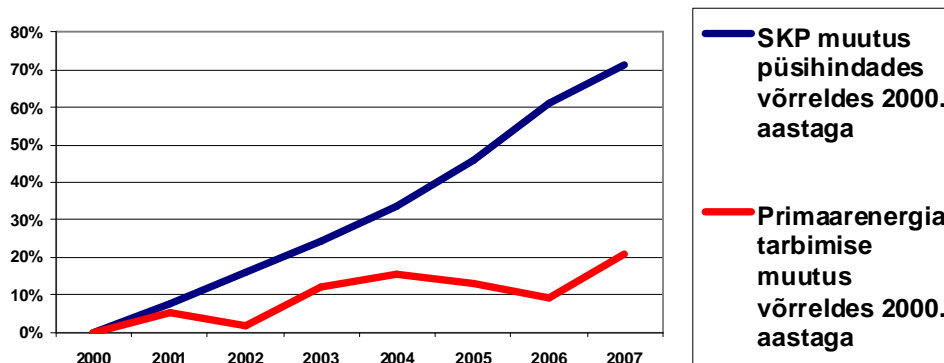
### SKP energiamahukuse trend Eestis (EEK2000 vääringus)



Reference: calculations on the basis of the data of the Statistical Office

The ratio of energy supply to GDP is improving in Estonia, this especially in the last years. Besides this trend there is another remarkable trend which is unique in the world: regardless of very rapid economic growth, the consumption of primary energy has decreased in Estonia.

### Püsihindades SKP ja primaarenergia tarbimise trendid Eestis



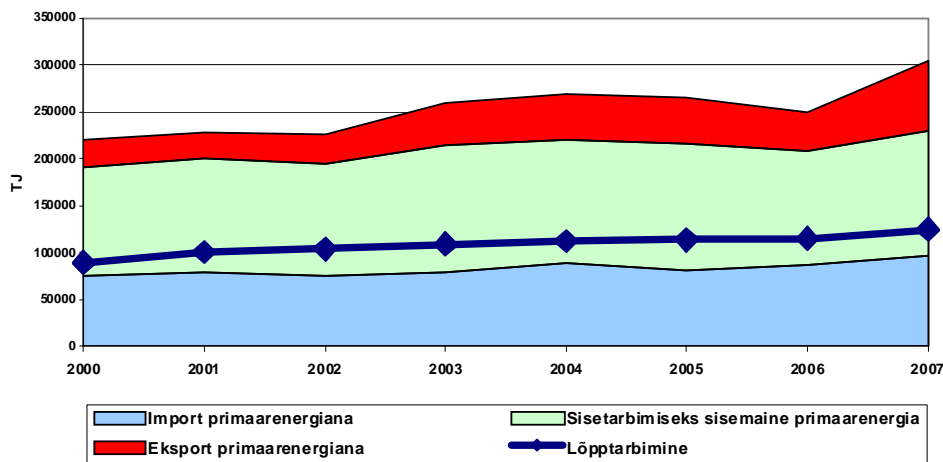
Reference: calculations on the basis of the data of the Statistical Office

By analysing the causes of this trend it can be seen that thermal energy consumption and energy losses in the heat and power networks have started to decrease in Estonia during the last years. Thus, the investments made upon the renovation of houses and the construction of new well-insulated houses and in particular upon the renovation of heat networks have decreased the total energy demand to a considerable extent. The increase of electricity consumption has been relatively modest and has depended greatly on the formation of new energy-intensive industries. The increase of the consumption of primary energy in 2007 resulted from the threefold increase

of export of electricity through the submarine cable Estlink to the Nordic countries; in 2007 the export of electricity to Latvia increased 1.5 times compared to 2006.

Domestic fuels (oil shale, peat, wood) still play an important role in energy supply; the share of domestic fuels in the primary energy resources has remained within 65% during the last decade. The existence of domestic fuel supplies has provided security upon supplying with energy, however, imported fuel formed 34% of the primary energy resources. Natural gas imported from Russia and petroleum fuels imported from Lithuania and Russia formed the biggest share of imported fuels. In 2006, approximately 20% of primary energy was exported.

Eesti primaarenergia ekspordi/impordi saldo



Reference: calculations on the basis of the data of the Statistical Office

12,189 GWh of electricity was produced in 2007, from which 93.6% was electricity produced from oil shale, the rest mainly natural gas and oil shale gas and wind power. In 2007, the final consumption of electricity was 7180 GWh, which has increased by 24% compared to 2000. The export of electricity formed 22% (2765 GWh) of the total amount of electricity produced and import formed 4.8% (345 GWh) of the total domestic consumption of electricity.

3570 GWh of thermal energy was produced in 2007, the installed electrical capacity of thermal power stations was 2760MW and thermal capacity 2542MW, the installed capacity of wind farms and hydroelectric power plants was 58 MW and 5 MW respectively. The final consumption of thermal energy (32644,8 TJ in 2007) increased by 6% compared to 2000.

Pursuant to the accession treaty between Estonia and the European Union, Estonia shall, as an exception, open 35% of its electricity market by 31 December 2008, the electricity market shall be open to all consumers by 31 December 2012. Directive 2003/55/EC concerning the internal market in natural gas provides for opening of the internal market for natural gas on the same principles as the Directive concerning the electricity market. The Natural Gas Act valid in Estonia provides the required framework for the opening of the market and for the implementation of the principles of the European Union. Pursuant to legislation the internal market in natural gas was fully open in Estonia by July 2007.

Although Estonia set an objective to achieve the indicative share of 2% of biofuels and other renewable fuels for use in transport by 2005 and 5.75% by 2011 (as calculated according to the energy content of the fuels), according to the Tax and Customs Board, the share of the consumption of biodiesel formed only 0.06% of the total consumption of petrol and diesel fuel (1,052,000,000 litres) in 2007. In 2007 there were four handlers of biofuel in Estonia who released for consumption the total of 665,309 litres of biofuel<sup>27</sup>, most of which was sold to the undertakings of other Member States (Sweden, Latvia and Germany).

## **1.4.2. Assessment of and forecast for Estonian energy market**

### **1.4.2.1. Electricity market**

According to the Estonian Competition Authority<sup>28</sup>, the electricity production and sales market in Estonia is very concentrated and orientated at one type of fuel – approximately 94 % of all the electricity is produced from oil shale, whereas the share of other fuels is very modest. In essence electricity production is controlled by the biggest energy undertaking – Eesti Energia AS, who owns 96% of the installed capacity and who produced 95.3 % of the total amount of electricity. In addition to 95 % of the production market, OÜ Jaotusvõrk with the market share of 86 % belongs also to the group of Eesti Energia AS. Also, the biggest oil shale producer AS Eesti Põlevkivi belongs to the group.

As compared to other states, Estonia is in a good state as for electricity market legislation. Regulation of the Estonian electricity market commenced by entry into force of the Energy Act in 1998. Since 2003 the energy market has been regulated by separate Acts: the Electricity Market Act, the Natural Gas Act, the District Heating Act and the Liquid Fuel Act. The rights and obligations of the electricity market regulator and of the market participants have been regulated by the Electricity Market Act. The closed market and the price regulation cause market distortions, there is practically no functioning electricity market.

The so-called climate package<sup>29</sup> published by the European Commission on 23 January 2008 plays an important role in the options of Estonian electricity production; the most important parts of the climate package for Estonia are the draft amendment to the Greenhouse Gas Emissions Trading Directive, the draft Renewable Energy Directive and the draft Carbon Capture and Storage Directive.

In connection with the opening of the electricity markets, electricity undertakings of other states will enter the market beside Estonian undertakings. The entry into market of new undertakings will increase competitiveness on the electricity market, but also uncertainty for the state with respect to the structure of production capacities and the location thereof. Because of this it is important to make preparations for ensuring adequate functioning of the open electricity market.

A more detailed overview of the electricity sector has been provided in the Development Plan of the Electricity Sector.

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<sup>27</sup> Ministry of Finance 2008, Monitoring Report Concerning State Aid for Biofuels

<sup>28</sup> Estonian Competition Authority, Estonian Electricity and Gas Market Report 2008, <http://www.konkurentsiamet.ee/?id=10836>

<sup>29</sup> Climate package [http://ec.europa.eu/climateaction/key\\_documents/index\\_en.htm](http://ec.europa.eu/climateaction/key_documents/index_en.htm)

### 1.4.2.2. Natural gas market

According to the Estonian Competition Authority, the natural gas market is open, but in essence pro forma open in Estonia, and there is no efficient competition in the gas market<sup>30</sup>. Estonia has connections only with Russia and Latvia and the only gas supplier in all the three Baltic States is Russia. Thus, there is no real competition between the sellers. In Finland the situation is also similar to that of the Baltic States, since all natural gas is imported thereto also from Russia.

AS Eesti Gaas has a dominant position both in wholesale and retail sale of gas, since AS Eesti Gaas is in essence the only importer and reseller of gas (AS Nitrofert imports gas exclusively for its own needs). The retail market share of AS Eesti Gaas is 93%. Besides the network operator AS EG Võrguteenus that belongs to AS Eesti Gaas group there are 26 smaller independent distribution network operators, but the small network operators, buy gas, without an exception, from AS Eesti Gaas.

1003 million m<sup>3</sup> of natural gas was consumed in 2007, which is 0.5% less compared to 2006. Approximately 20% of this gas was consumed by AS Nitrofert.

According to the Estonian Competition Authority, the gas consumers are well protected by legislation, the gas supply risks are related to the supply from a single source – Russia. In the peak period of gas consumption gas is supplied mainly from the Latvian storage. The risk of gas supply has increased to some extent, since, unlike in the last years, since spring 2008 most of the gas stored in the Latvian gas storage is not owned by AS Eesti Gaas any more but by Gazprom.

In order to ensure the security of gas supply, gas undertakings shall be able to use natural gas supplies which may be located also abroad. In order to increase the security of gas supply, the possibilities for the construction of new cross-border connections, the liquid and liquefied gas terminals shall be examined and the conditions for entering the market shall be improved and, if necessary, obligations shall be provided for network owners by law. In addition, the possibilities to use compressed, natural and liquid gas in transport shall be examined.

### 1.4.2.3. Heat market

During the period 1995–2003 heat consumption decreased by 24.6%. In connection with the general economic growth heat consumption increased by 1-2% a year during 2004–2005, during 2006–2007 heat consumption decreased by 3% as a result of economic slowdown. In 2007, 46% of the heat in the district heating systems was produced on the basis of natural gas. District heating forms 71% of the heat consumed in Estonia<sup>31</sup>. Over the past few years the prices of district heating have increased significantly due to the price rises on liquid fuel markets. Bigger district heating undertakings using natural gas shall have the possibility to use reserve fuel<sup>32</sup>, if necessary.

Upon heat consumption, special attention shall be paid on the continuous development of energy conservation measures. Significant progress has been made in reducing heat network losses,

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<sup>30</sup> Estonian Competition Authority, Estonian Electricity and Gas Market Report 2008, <http://www.konkurentsiamet.ee/?id=10836>

<sup>31</sup> Reference: Statistical Office, Energy Balance 2007

<sup>32</sup> District Heating Act <https://www.riigiteataja.ee/ert/act.jsp?id=12894819>

during the period 1995–2005 heat losses decreased by approximately 28%. This has been facilitated by the development of regulation, increased energy prices and sufficient investment capacity of undertakings.

Several challenges have arisen with respect to the functioning of the district heating market. The following are some examples of bottlenecks:

1. The present regulation directed at a natural monopoly does not facilitate undertakings to make investment decisions to change energy sources, but is directed at covering the costs of the existing equipment and energy resources. This brings about a situation where even the wrong investment decisions made by an undertaking shall be paid up by the consumers. Undertakings are not interested in taking into use cheaper solutions, which would reduce heat price, since they wish to protect the investments, which have already been made, and there is no economic interest to make new investments.
2. Supervision over heat price is fragmented. The Estonian Competition Authority exercises price supervision over major undertakings. Price supervision over smaller heat producers shall be exercised by the local governments, who, however, often do not have sufficient competence for exercising supervision. Cases have occurred, where heat price has been determined based on political, not economic considerations.
3. The regulation does not enable undertakings to respond to the rapid changes in the world market fuel prices at an acceptable speed.
4. Sometimes the decisions made at the local government level do not coincide with the trends of the national energy policy.

The determinative trend on the district heating market in the next few years is more extensive use of combined heat and power production and diversification of the production portfolio.

The use of heat pumps has increased constantly as a positive trend in local heat supply. Estonia is among the first three states in the world as for the use of heat pumps per capita. As a second local solution local fuels have been preferred, the use of which enhances the development of Estonian economy.

A national development plan shall be prepared for even and integral development of the whole heat sector.

#### **1.4.2.4. Liquid fuel market**

The retail market of liquid fuels has functioned well in Estonia. The wholesale market of liquid fuels has concentrated to Mazeikiu Nafta, but there are no big risks of market abuse taking into account the distribution of the retail market.

The Estonian Oil Stockpiling Agency established by the state has established liquid fuel stocks in compliance with the Liquid Fuel Stocks Act<sup>33</sup>. The establishment of fuel stocks arising from the EU requirements prescribed by the Act, which form 90 days' average domestic gross consumption in the previous year, shall be completed by 2010 (55 days' stocks has been established by now). The existence of 15 days' stocks shall be ensured in Estonia, the rest of the

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<sup>33</sup> Liquid Fuel Stocks Act <https://www.riigiteataja.ee/ert/act.jsp?id=12794210>

Estonian stocks may be stored in Finland, Sweden and Denmark. In order to comply with the IEA requirements, the amount of liquid fuel stocks shall correspond to at least 90 days' net import of crude oil and liquid fuels in the previous year. It is also necessary to prepare a programme for limiting the consumption of liquid fuels in the case of serious supply shortages and legislation for communicating information to the IEA.

The European Commission gives priority<sup>34</sup> to the development and extension of the second-generation biofuels in transport with an aim of increasing the share of environment-friendly fuels and achieving 10% mandatory minimum share of biofuels in motor fuels by 2020. In 2007, the share of biodiesel formed only 0.06% of the total consumption of petrol and diesel fuel<sup>35</sup>.

In order to promote the use of biofuels in transport, exemption from excise duty has been prescribed for biofuels in the Alcohol, Tobacco and Fuel Excise Duty Act until expiry of the permit issued by the European Commission on 1 January 2010. Application of exemption from excise duty has been an impulse for the commencement of activities of several undertakings producing biofuel.

According to the biofuel reports submitted to the Tax and Customs Board, there were four handlers of biofuel in Estonia in 2007 who released for consumption the total of 665,309 litres of biofuel. While in 2007 the total consumption of petrol and diesel fuel was 1,052,000,000 litres, the share of the consumption of biodiesel formed only 0.06% of the total consumption of petrol and diesel fuel. In 2007, the weighted average sales price of biofuel (in 100% concentration) for the final consumer or the acquirer was 15.8 kroons, VAT included. In the case of the abovementioned sales price, lower energy value of biofuel (ca 38.6 MJ/kg) compared to fossil diesel fuel (energy value approximately 43 MJ/kg) was also taken into account. In 2007, the price of the fossil diesel fuel sold in gas stations in Estonia was approximately 13.71 kroons, including taxes.<sup>36</sup>

According to the National Audit Office, the consumers do not have any guarantee as for the quality of the biofuels used currently in transport and thus readiness to use biofuels.<sup>37</sup>

Estonia has taken a position that the objective to use 10% of biofuels is mandatory only if economically expedient biofuels which comply with the EU sustainability criteria for biofuels are developed. Biomass, from which foodstuffs are produced, would not be used as a raw material for biofuels any more and sustainability requirements for production shall be complied with. Estonia seconds permission for the use of peat upon the production of biofuels in Estonia provided that the sustainability requirements are complied with.

According to the survey<sup>38</sup> carried out, the potential measures for the development of the market of biofuels are the following;

- exemption of biofuels from excise duty,

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<sup>34</sup> Strategic Energy Technology Plan (SET-Plan) <http://europa.eu/scadplus/leg/en/lvb/l27079.htm>

<sup>35</sup> Ministry of Finance 2008, Monitoring Report Concerning State Aid for Biofuels

<sup>36</sup> Ministry of Finance 2008, Monitoring Report Concerning State Aid for Biofuels

<sup>37</sup> National Audit Office Report no OSN-2-6/06/25, 28.04.2006 "State Action upon Dealing with Issues Concerning Rape and Biodiesel"

<sup>38</sup> HeiVäl Consulting "Measures to Be Taken in Order to Increase the Share of Biofuel in the Fuel Used in Transport" <http://www.mkm.ee/index.php?id=352180>

- requirement of mandatory sales of biofuel,
- mandatory use of biofuels in public transport,
- supporting the purchase of buses adapted for biofuels,
- supporting the installation of biofuel filling stations for buses,
- direct supports to the producers of biofuel and/or biomass in proportion to the volume of production,
- state aid for the preparation of the infrastructure of biofuels.

According to the summary of the impact of the measures, the disadvantages of the production of biomass in Estonia include lack of stable demand, high price of the raw material of biofuels, competition with the food industry for the raw material - rape and absence of infrastructure for the preparation of 5- or 10%-biofuels.

#### **1.4.2.5. Local solid fuels market**

Increase in the price of liquid fuels on the world market has brought about increase in the price of wood fuels and peat. At the same time these domestic fuels are more and more competitive on the heat and electricity market. The previous export of these resources is being gradually replaced by domestic consumption.

Several new cogeneration stations using wood, peat and also waste will be completed in the next few years, which will increase significantly demand for these resources, which in its turn may lead to rise in the price of these resources. Potential incineration of wood waste in Narva oil shale boilers contributes to the reduction of the environmental impact of electricity production. Increase of the use of these domestic energy resources is important for the sake of the diversity of energy balance, environmental protection, employment and market stability. The use of oil shale for electricity production is decreasing gradually by providing more opportunities for the production of shale oil and oil shale chemicals.

#### **1.4.2.6 Oil shale market**

2.994 million tons of oil shale was used for the production of shale oil and shale gas and other chemical products in Estonia in 2007. In 2007, the total of 417 thousand tons of shale oil was produced, the total of 77 thousand tons of shale oil was used for domestic consumption and 360 thousand tons of shale oil was exported (the total shale oil resource in 2007: 472 thousand tons)<sup>39</sup>. The demand for shale oil products has increased significantly and the possibilities to construct new production capacities have become attractive in connection with the increase of the world market prices of crude oil. The price of thermal energy based on shale oil has increased considerably on the Estonian market.

The potential of the production of shale oil in Estonia in future will depend on the permitted volumes of oil shale extraction and the amount of oil shale required for the production of electricity. The priority for Estonia is to ensure the amount of oil shale necessary for supplying the state with electricity, the rest of the oil shale may be used for the production of shale oil and chemical products.

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<sup>39</sup> Reference: Statistics Estonia, Energy Balance 2007

However, upon the production of shale oil, it shall be ensured that the old production equipment will be gradually replaced by new and environment-friendly technologies in order to produce more highly valued oil and chemical products. The state shall also review the basis of taxation of the production of shale oil proceeding from the changed situation of the world market and based on the results of the analysis, make amendments to legislation, if necessary.

Upon the development of research in the field of oil shale it is important to export Estonian know-how in the field of the production of shale oil and chemical products to other interested states and to facilitate placing of these products on external markets. Estonian local oil shale resource is too limited for the development of a large-scale industry.

### **1.4.3. National energy conservation policy**

The objective of the national energy conservation policy is to ensure efficient use of energy resources, their long-term availability at optimal prices and to alleviate the environmental damage and risks related to the use of energy.

Programmes for the promotion of the Estonian energy sector have been implemented consistently since restoration of the independence of Estonia. The first source document of activities related to energy conservation – the Energy Conservation Programme of Estonia – was approved on 24 July 1992; the currently valid Energy Conservation Target Programme for 2007-2013<sup>40</sup> was approved by the Government of the Republic on 5 November 2007. The Implementation Plan for the Energy Conservation Target Programme for 2007-2009 was prepared on the basis of the Energy Conservation Target Plan.

The Sustainable Energy Division of the Energy Department of the Ministry of Economic Affairs and Communications is responsible for the implementation of the energy conservation policy. During the period 2001–2006 the implementation of the Implementation Plan for the Energy Conservation Target Programme was financed in the total amount of 5.255 million kroons, in addition investments of local governments directed at the energy conservation have been supported from the state budget (in the total amount of 52.09 million kroons during the period 2001–2007) and foreign aid has been received for the implementation of the energy conservation policy. Support has been allocated to local governments for the modernisation of the district heating systems and buildings managed thereby and also for the implementation of the reconstruction projects of apartment houses within the housing policy of the state and for the development of the rental housing fund by the local governments.

The Energy Efficiency Consulting Centre has operated at the Credit and Export Guarantee Fund KredEx since 2006, the direct task of which is to enhance the awareness of the owners and possessors of apartment houses in the field of energy conservation and to support investments in energy conservation.

The most effective investments for the improvement of energy efficiency were made by energy undertakings during the period between 2001–2005. Introduction of new type of boilers and putting into operation of new cogeneration capacities improved energy efficiency of the power plants; network losses have decreased as a result of the reconstruction of power transmission and distribution networks.

So far the investments of the local governments directed at saving of fuels and energy supported by the Ministry of Economic Affairs and Communications have been monitored in the course of

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<sup>40</sup> Energy Conservation Target Programme for 2007–2013 <http://www.mkm.ee/index.php?id=352791>

implementation of the Estonian energy conservation policy. The estimated savings of the projects implemented between 2002–2006 have varied between 1.1.. 6.8 TJ; in 2006 the final consumption of energy was 114,709 TJ. At the same time the state implements several other measures, the energy conservation effect of which is higher. Monitoring of efficiency of the national policy expressed in energy conservation requires major improvement in Estonia.

Energy conservation policy in other states has indicated that more efficient use of fuels and energy improves the competitiveness of economy, increases energy security, has a positive impact on the external balance, employment and environmental awareness of people. Impact on the environment will decrease, investments into expensive energy infrastructure projects will be reduced.

## **1.5. EU Energy Regulation**

### **1.5.1 EU's third internal natural gas and electricity market package**

On 19 September 2007<sup>41</sup>, the European Commission submitted to Council and the European Parliament a package consisting of the following drafts: a) a proposal for a Directive amending Directive 2003/54/EC on common rules for the internal electricity-market; b) a proposal for a Directive amending Directive 2003/55/EC concerning common rules for the internal market in natural gas; c) a proposal for a Regulation establishing an Agency for the Cooperation of EU Energy Regulators; d) a proposal for a Regulation amending Regulation 1228/2003/EC on conditions for access to the network for cross-border exchanges in electricity; e) a proposal for a Regulation amending Regulation 1775/2005/EC on conditions for access to the natural gas transmission networks.

As envisaged by the Commission, the proposed drafts should strengthen the internal market in electricity and gas and ensure full and efficient opening of these markets in the European Union. The most important proposals of the Commission include separation of the ownership of supply and production operations from transmission network operations, enhancement of cooperation between the market regulators and transmission network operators of the Member States, establishment of a new agency for the cooperation of EU energy regulators (market regulators), development of cross-border trade in energy and establishment of control over the share of capital originating from third countries in the EU transmission network undertakings.

From the point of view of Estonia it is important to solve the problems arisen on energy markets integrately by avoiding causing of new problems. Thus, all the aspects of domestic market, competition policy, emission trading, external trade and security shall be taken into account. In addition, in the electricity market sector it is important to settle the issue of restricting the import of electricity from third countries. Thus, the objectives established by the package for the European Union as a whole are positive from the point of view of Estonia, but the requirements established in the package shall be clear and unambiguous and take the peculiarities of the Baltic region into consideration.

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<sup>41</sup> [http://ec.europa.eu/energy/strategies/2008/2008\\_01\\_climate\\_change\\_en.htm](http://ec.europa.eu/energy/strategies/2008/2008_01_climate_change_en.htm)

### 1.5.2. EU climate and energy package

In March 2007, the European Council adopted the EU's Action Plan for Energy Policy 2007-2009 (hereinafter EU energy policy), the objectives of which are:

- increasing security of supply;
- ensuring the competitiveness of European economies and the availability of affordable energy;
- promoting environmental sustainability and combating climate change.

In the package of measures i.e. the so-called climate package (consists of 4 directives and 1 decision) developed for the implementation of the EU energy policy published on 23 January 2008<sup>42</sup>, the most important target values are the ones established for energy efficiency, the use of renewable energy sources and biofuels, including for environmentally safe carbon capture and storage for 2020:

- achieving at least a 20 % reduction of greenhouse gas emissions compared to the base year 1990 (by 2005 the greenhouse gas emissions had been reduced by 6 %);
- increasing the share of renewable energy to 20 % of the final consumption of primary energy (in 2005 the average share in EU was 8.5 %);
- achieving 20 % more efficient use of energy in the final consumption of primary energy;
- increasing the share of biofuels up to 10 % in transport fuels provided that second-generation biofuels are developed.

The Climate and Energy Package was confirmed by the European Council on 11-12 December 2008 and approved by the European Parliament on 17 December 2008.

The emissions of greenhouse gases (GHG) shall be reduced in two parts – within the framework of the trading scheme of permissible GHG emissions (hereinafter "ETS" - emission trading scheme) and through state obligations in the sectors not included in the scheme.

The reduction of emissions within the framework of ETS is achieved by the scheme of allocation of allowances (quotas). As of 2013 the permissible quantity of total annual emission allowances shall decrease by a linear factor of 1.74 % in order to reduce the emissions covered by the scheme by 21 % by 2020 compared to the level in 2005. Member States may exclude small installations with annual emission of less than 25,000 tonnes of carbon dioxide and a rated thermal input below 35 MW from ETS.

It is planned to replace the national allocation plans by auctioning or free allocation of permissible emissions through single EU-wide rules. In the scheme of allocation of emissions, organisation of auctions, which should increase the price of an allowance and thus motivate the undertakings to apply cleaner technologies, becomes most important. 88 % of the total quantity of allowances to be auctioned will be distributed among Member States according to their share of the verified Community scheme emissions either a) as of 2005 or b) the average for the period 2005-2007, whichever is higher. In case of Estonia the average verified emissions for the period 2005-2007 is higher (13.4 million tons). The rest of the 10% and 2% of the total quantity of allowances to be auctioned shall be allocated according to the principle of solidarity, economic

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<sup>42</sup> Climate package [http://ec.europa.eu/climateaction/key\\_documents/index\\_en.htm](http://ec.europa.eu/climateaction/key_documents/index_en.htm)

growth and early reduction. The European Commission will publish the estimated number of allowances to be auctioned by the end of 2010.

The electricity production sector – representing a large part of emissions – would be subject to auctioning from the start of the new ETS in 2013. However, Member States may grant transitional free allocations for small installations which were engaged in the production of electricity on 31 December 2008 or for small installations for which an investment process had been initiated for the same date if one of the following conditions is met:

- the national electricity network was not, in 2007, directly or indirectly connected to the network interconnected system (central European power system) operated by the Union for the Coordination of the Transmission of Electricity (UCTE); or
- where the national electricity network was, in 2007, only directly or indirectly connected to the network operated by the Union for the Coordination of the Transmission of Electricity (UCTE) through a single line with a capacity of less than 400 MW; or
- where, in 2006, more than 30 percent of electricity was produced from a single fossil fuel, and, where in 2006 the gross domestic product per capita at market prices did not exceed 50 % of the average gross domestic product per capita of the EU.

- Free allowances shall be allocated on the basis of an investment plan. Transitional free allocations shall be deducted from the quantity of allowances the Member State would otherwise auction. Free allowances shall be allocated for a specified term and limited in quantity: in 2013, the total transitional free allocation shall not exceed 70 % of the annual average verified emissions in 2005-2007 from such generators for the amount corresponding to gross final national consumption pursuant to verified emissions in 2005-2007 of the Member State concerned and shall gradually decrease thereafter, resulting in no free allocation in 2020. Free allowances shall be allocated to electricity production on the basis of the relevant activity plan of the Member State, an application shall also be submitted to the European Commission.

Based on the abovementioned conditions, the option to allocate free allowances in the transitional period for modernisation of electricity production applies also to Estonia. Partial allocation of free allowance may turn out to be necessary upon the development of new electricity production capacities in Narva Power Plants.

- Free allowances shall be allocated for the production of heat in district heating boiler plants and through high efficiency cogeneration, the quantity of which shall decrease by a linear factor of 1.74% a year starting in 2013. Other industrial sectors with no risk of carbon leakage will step up to auctioning gradually; in the period 2013-2020 the share of allowances will increase from 20% to 70% of the European Community reference and the system of auctioning will be fully implemented by 2027.

Auctions shall be organised by Member States and the revenues would be received by Member States. The auctions shall be based on the principles of openness, transparency, harmonised approach and non-discrimination. For example, each operator operating in the European Union may buy allowances in any Member State. By 30 June 2010 at the latest, the European Commission shall adopt a Regulation which regulates the timing, organisation and other aspects of auctions.

- The auctioning process would generate significant revenues for Member States, which would help towards the process of adjustment to a low carbon economy, supporting research and development and innovation in areas like renewables and carbon capture and storage, helping

developing countries, and helping the less well-off to invest in energy efficiency. Member States shall use at least 50% of their auctioning income for that purpose. Member States shall notify the European Commission of the use of auctioning income.

- In the climate package specific attention has been paid to industrial sectors exposed to the risk of carbon leakage, the international competitiveness of which may deteriorate significantly as a result of the implementation of the prerequisite for the climate package. The European Commission shall prepare analysis of such sectors (mainly energy-intensive industries) by the end of 2009 and the relevant list of industries shall be approved by the European Council. The European Commission shall present proposals for the required further action with respect to these sectors at the European Union level not later than by 30 June 2010. Installations in industrial sectors or sub-sectors which are exposed to a significant risk of carbon leakage will be allocated, in the period 2013-2020, 100% of allowances free of charge at the level of the benchmark of the best technology available.

- It is important to point out that in its impact assessment of the negotiations on an international climate change agreement and upon the presentation of further action, the European Commission shall take account of the impact of carbon leakage on Member States' energy security, where there are cross-border electricity connections with third countries and where the electricity connections with the internal market of the rest of the European Union are insufficient. Taking into account, for example, the nature of the cross-border electricity connections of Estonia and depending on the results of the international climate change agreement, this may mean a possibility to establish common measures at the European Union level for the regulation of the import of electricity produced in third countries, e.g. by including import in the emission trading system.

The reduction of GHG emissions in the sectors outside the ETS will be achieved through national obligations to reduce GHG. In the sectors not covered by the EU ETS such as buildings, transport, agriculture, waste and industrial installations the emissions of which are lower from the quantities prescribed for accession to the ETS, the obligations to reduce emission are shared between Member States according to GDP per capita. In case of the abovementioned sectors, EU aims to reduce emissions by 10% compared to 2005. For Estonia it is permitted to increase emissions in the abovementioned sectors by up to 11% by 2020.

For the purposes of organisation of the distribution and use of the income received within the framework of the emission trading scheme, a concept of the relevant organisational structure shall be adopted in Estonia in 2010. When the concept is agreed upon and approved, principles shall be adopted for the implementation of the updated emission trading scheme in Estonia, including the principles for the organisation of allowance auctions and for the distribution and use of the income received from the allowance auctions.

The objective of the Renewable Energy Directive is to establish a common framework for the promotion of the use of energy from renewable sources. One of the most important elements in the Directive is national renewable energy targets, which determine the percentage of the consumption of renewable energy to be achieved by each Member State by 2020 with an aim to increase the overall EU share of renewable energy to 20% by 2020. Thereby indicative interim targets have been established which are calculated as an average for a two-year period. By 2020 the share of energy from renewable sources shall form 25% of the total final consumption in Estonia. The share of energy from renewable sources is calculated as the ratio of consumption of energy from renewable sources over total final consumption. According to the Directive, final

consumption includes energy consumption of different economic sectors and energy consumption in the energy sector together with losses.

It is up to Member States to decide on which possibilities of renewable energy production to focus. Also, more attention shall be paid on the reduction of greenhouse gas emissions and the increase of security of power supply in the transport sector.

The objective of the Carbon Capture and Storage Directive is to ensure that carbon capture and storage is used as a means of mitigating climate change and that this is carried out in a secure and responsible way. Although no separate free allowances have been prescribed for carbon dioxide capture and storage (except up to 300 million tons up to the end of 2015 set aside in the new entrants reserve for supporting EU demonstration projects), the Emissions Trading Directive enables Member States to use in the years 2013-2016 the income received from the auction of allowances for the promotion of the construction of highly efficient power plants, including the construction of new power plants enabling carbon dioxide capture and storage. In case of new installations with the efficiency exceeding the efficiency values provided for power plants in Annex 1 to the Commission decision 2007/74/EC (e.g. the reference value for separate production of electricity from oil shale is 39.0%), Member States may bear up to 15% of the total cost of the investments related to the new installations enabling carbon dioxide capture and storage.

### **1.5.3. European Strategic Energy Technology Plan**

In order to achieve the objectives specified in the EU energy policy, an obligation was imposed on the European Commission to prepare the European Strategic Energy Technology Plan (SET-Plan)<sup>43</sup> in order to promote energy efficient and low carbon energy technology in the European economy. The Commission published a communication on the European Strategic Energy Technology Plan on 22 November 2007. The Commission has, in cooperation with the Member States defined 6 priority areas planned to be developed expeditiously:

- initiative in wind energy,
- initiative in solar energy,
- initiative in bioenergy,
- initiative in capture, transport and storage of CO<sub>2</sub>,
- initiative in the European power network and
- initiative in nuclear energy.

A challenge has been set on the basis of the European Strategic Energy Technology Plan to develop the technologies of sustainable second-generation biofuels, CO<sub>2</sub> capture, transport and storage and to double the power generation capacity of the largest wind turbines, to introduce large-scale photovoltaic and concentrated solar power solutions, to establish a single and smart European electricity grid (for the integration of renewable and decentralised production), to bring more efficient equipment (heat pumps, fuel cells) to the market and to maintain competitiveness in nuclear technology by finding waste management solutions.

The European Strategic Energy Technology Plan pursues the following:

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<sup>43</sup> European Strategic Energy Technology Plan <http://europa.eu/scadplus/leg/en/lvb/l27079.htm>

- a) the transformation of the governance of the energy research and innovation system through the engagement and the commitment of all stakeholders in a coherent programme;
- b) a strategic planning that orients the research and innovation efforts towards technologies and measures with the greatest potential to deliver the European energy policy targets;
- c) a more effective implementation, execution and management of all activities across the whole innovation process;
- d) a cost-effective and results-oriented allocation and increase of means.

In order to direct the activities of Estonia in the energy sector, the analysis "Estonian Development Strategy of Energy Related Technologies"<sup>44</sup> was completed in spring 2007, which points out the development trends of energy technology important for Estonia and the need to increase the implementation of measures supporting research and development. The development trends pointed out in this analysis include the development of the integral process of oil shale (from extraction up to the final consumer) and research and development of new, mainly renewable energy resources. In addition to oil shale technologies and new technologies based mainly on renewable energy sources, energy conservation shall be studied. The Estonian Energy Technology Programme<sup>45</sup> was prepared on the basis of the research, where the measures and activities of the development trends of the energy sector are discussed in more detail.

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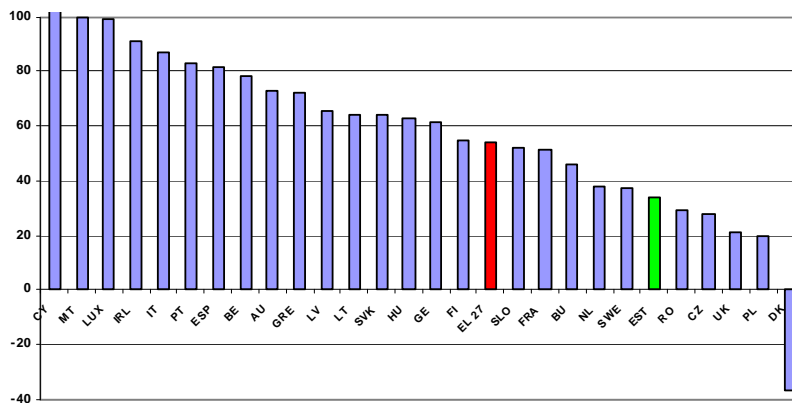
<sup>44</sup> SWOT Consulting, HeiVäl Consulting "Estonian Development Strategy of Energy Related Technologies" 2007 <http://www.mkm.ee/index.php?id=352180>

<sup>45</sup> Estonian Energy Technology Programme <http://www.hm.ee/index.php?03242>

## 1.6. Comparison of the Estonian Energy Sector with Other States

**Energy dependency.** Energy dependency indicates the ratio of the net import of energy sources to the total consumption of energy. As for this indicator, Estonia is one of the most independent states among the states of the European Union (ranking 5th with the 28.5% share in 2004), Natural gas and liquid fuels are imported to Estonia, wood fuels and oil shale are exported.

EL riikide energiasõltuvus 2006. aastal

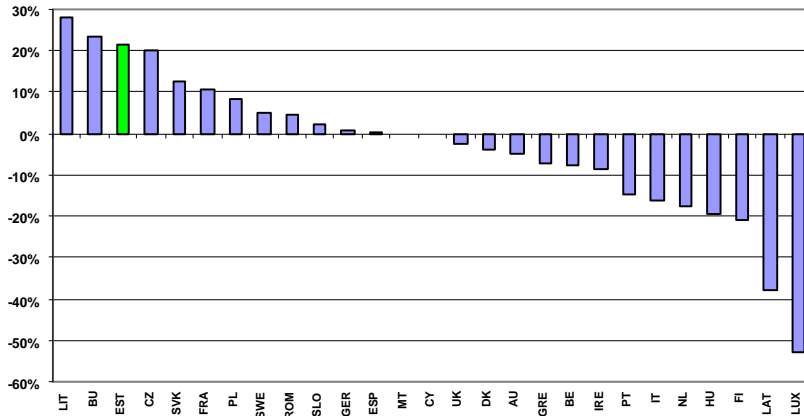


Reference: International Energy Agency IEA

The European Union as a whole depends on imported energy sources to the extent of approximately 50% and this trend is increasing. Estonia is one of the few Member States whose energy dependence has decreased year by year.

Energy dependency does not reflect the Member States' export-import balance of electricity. In 2005, -in Estonia export of electricity formed approximately one fifth of electricity used; this indicator ranked third among the Member States of the European Union after Lithuania and Bulgaria. This fact has also a significant impact on all the other indicators discussed hereafter, since this electricity was produced to a great extent from oil shale, which increased primary energy demand of Estonia, however, this energy was not used in Estonia.

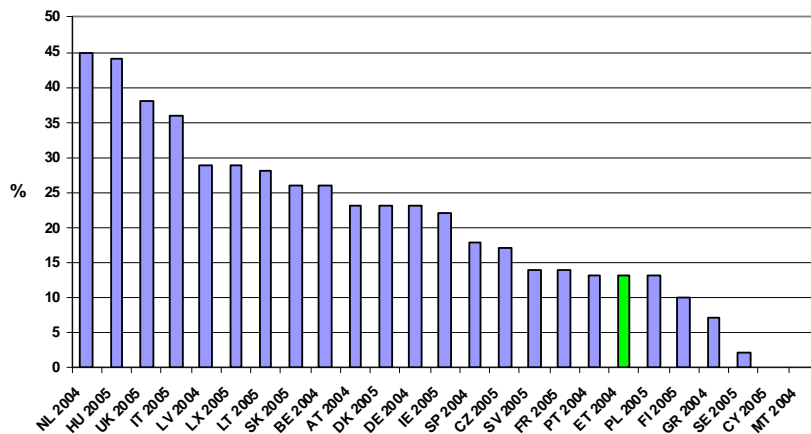
**Elektri ekspordi/impordi osakaal elektri tarbimisest  
EL liikmesriikides 2005. aastal**



Reference: International Energy Agency IEA

**Share of natural gas.** Estonia is 100% dependent on the import of natural gas from Russia; at the same time natural gas forms less than 15% of the energy balance in Estonia. This is a relatively low indicator compared to other Member States of the European Union.

**Maagaasi osakaal EL riikide energiabilansis**



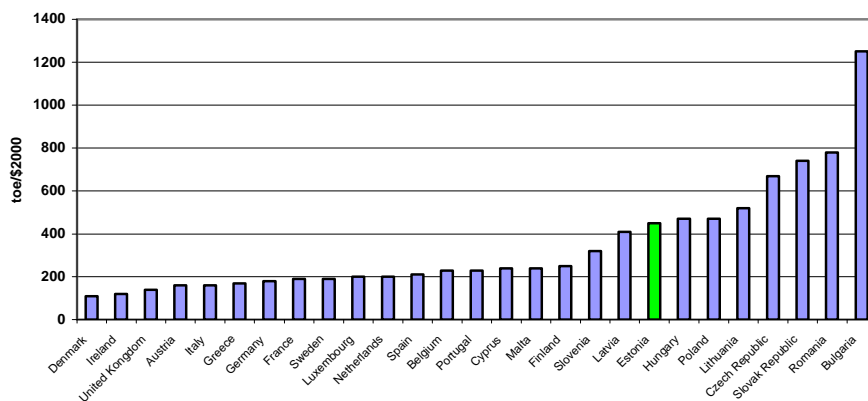
Reference: International Energy Agency IEA

**GDP energy intensity.** GDP energy intensity is often used in the comparison of the energy sectors of different states. This indicator shows the amount of energy used in the state's economy or in other words the amount of primary energy (energy included in all the used energy sources) used per one unit of the gross domestic product (GDP) (measured in monetary units) in a year.

This indicator is significantly influenced by the structure of economy (especially the share of energy intensive industry in the state's economy), the import/export ratio of energy sources (as a

rule, the states, which extract and export energy sources, have higher energy intensity, the states, which import energy sources, have lower energy intensity), the basis for GDP calculation (current or constant prices, purchasing power parity<sup>46</sup>), changes in the exchange rate of the currency used during a definite period of time (e.g. changes in the exchange rate of USD/EUR by year), the climate (as a rule, the amount of fuel used is bigger in a colder climate) etc.. Thus, GDP energy intensity cannot be used as a measurement of comparison of the efficiency of the energy sector of different states, it provides, however, an assessment of the energy intensity of the state's economy.

SKP energiamahukus EL liikmeriikides 2005. aastal  
(toe/SKP kohta \$2000 vääringus)



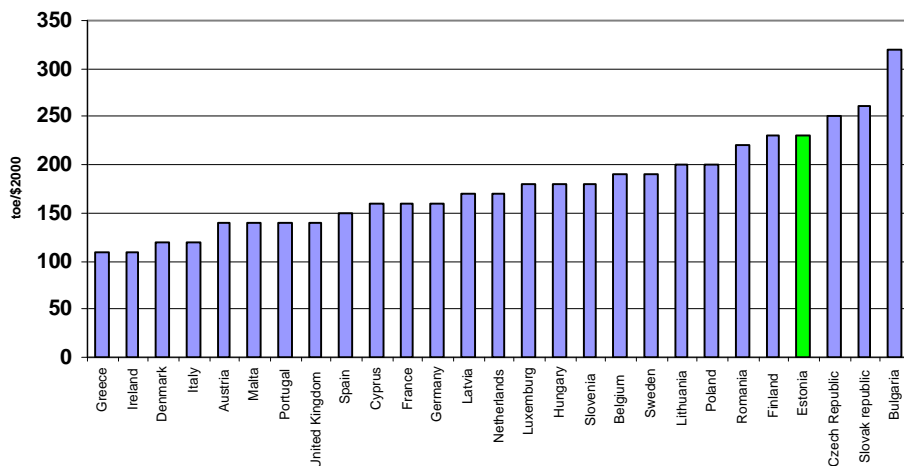
Reference: International Energy Agency IEA

Based on the data of the International Energy Agency (the data cover 137 countries in the world), in 2005 the GDP energy intensity of Estonia was 458 toe/USD in the current prices of 2000. With this indicator Estonia rose from the 66th place to 59th place among the examined states. Estonia rose to the 20th place among the Member States of the European Union by passing Poland and Hungary in a year. Hong Kong (90 toe/USD) hold the first place in the world and Congo (3380 toe/USD) hold the last place.

Taking purchasing power parity into consideration, Estonia shared the 76th place in the world as for GDP energy intensity, Estonia was on the 24th place among the Member States of the European Union. Hong Kong holds the first place and Iraq the last place according to this indicator.

<sup>46</sup> "Purchasing power parity" means the exchange rate of currencies which equalizes the purchasing power of different currencies

**SKP energiamahukus ostujõu pariteetsuse alusel  
EL liikmesriikides 2005. aastal**

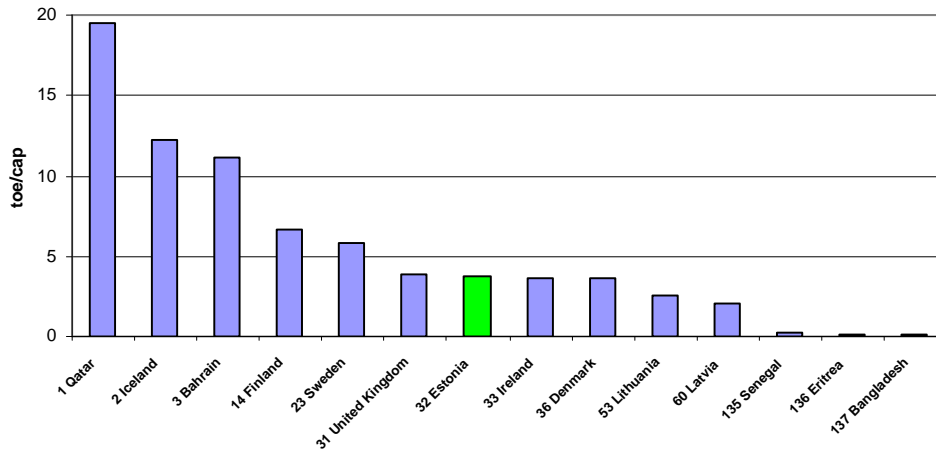


Reference: International Energy Agency IEA

**Energy demand per capita** means the ratio of the total primary energy consumption to the number of inhabitants of a state. The welfare of a state in the energy supply of people is assessed on the basis of this indicator, however, in the comparison with other states this indicator is influenced by the same factors that distort the level of the domestic primary energy consumption in general and which are relatively unrelated to the welfare of people being compared (the share of energy intensive industry, export/import of energy carriers, climate). At the same time regularity can be seen here - the states with better welfare are at the top of this ranking and poorer states at the bottom of the ranking.

As for energy demand per capita, in 2005 Estonia was on the 32nd place with 3.79 toe per capita among the states analysed by the International Energy Agency, which is the same place as last year. The first top three in the world are Qatar with 19.47 toe per capita (thanks to the export of petroleum products), Iceland with 12.25 toe per capita (thanks to energy intensive metal industry) and Bahrain with 11.18 toe per capita. The last three among the studied states were Senegal, Eritrea and Bangladesh (with 0.26, 0.18 and 0.17 toe per capita respectively).

Primaarenergia tarbimine inimese kohta (toe/capita) 2005. aastal

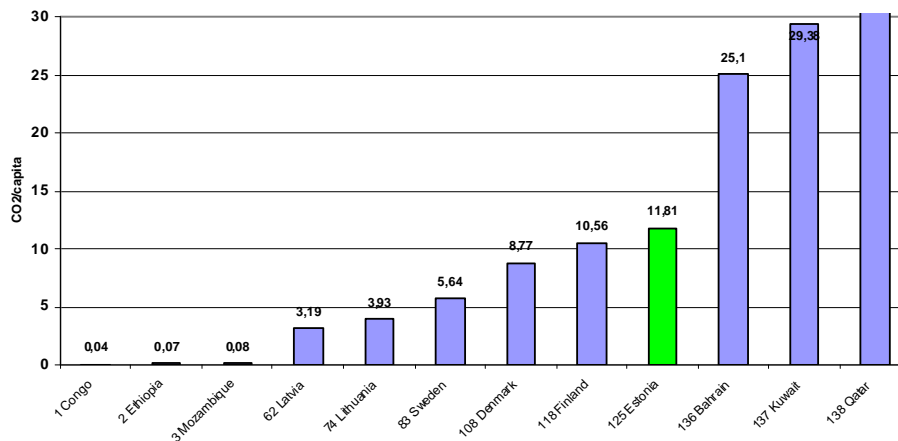


Reference: International Energy Agency IEA

**Carbon dioxide emissions per capita** indicate to a great degree the pollution intensity of the energy sector of the state, since most of the CO<sub>2</sub> emissions of a state are related to energy facilities.

As for CO<sub>2</sub> emission, Estonia is a state which is in one of the worst condition in the world (holds the 125th place) due to CO<sub>2</sub> intensive oil shale use, export of electricity and cold climate. The assessment of this indicator points out a trend that the states exporting energy sources, states located in a cold climate or states with energy intensive industry are more CO<sub>2</sub> intensive.

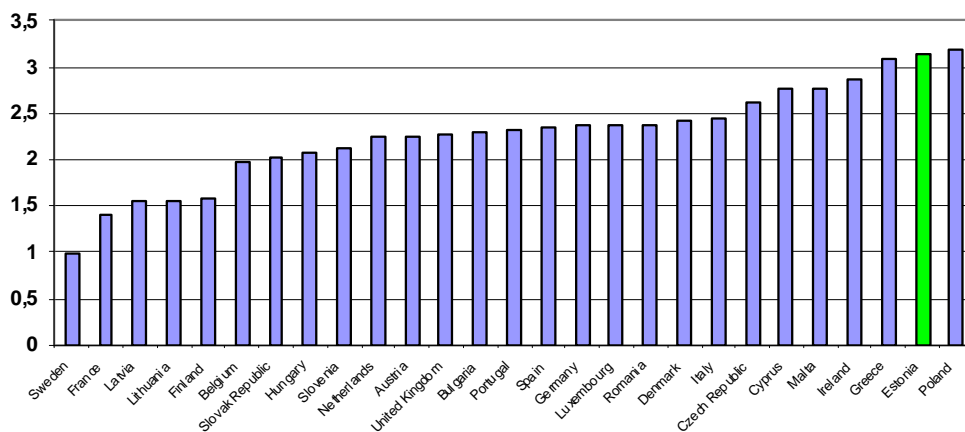
CO<sub>2</sub> heitmed inimese kohta maailma riikides 2005. aastal



Reference: International Energy Agency IEA

**The CO<sub>2</sub> intensity of the energy sector** is calculated by dividing these emissions by the amount of primary energy. The Estonian energy sector is one of the most CO<sub>2</sub> intensive countries among EU countries.

CO<sub>2</sub> heitmed primaarenergia tarbimise kohta  
EL riikides 2005. aastal



Reference: International Energy Agency IEA

At the same time the climatic conditions, the export/import ratio and the structure of the energy sources used should be studied also here in the interests of the comparability of data. For example, at the top of this ranking there are nuclear-weapon states (Sweden, Lithuania, France, Finland), states with great hydro resources (Sweden, Latvia) and states importing electricity (Latvia, Finland) – in all these cases covering of electricity demand is not accompanied by CO<sub>2</sub> emissions.

## 1.7. Infrastructure

Estonia has power transmission connections with Russia and Latvia and since the end of 2006 also a direct current link (submarine cable) with Finland. 330 kV lines with the total capacity of 1050 MW run from Narva to Russia and a 330 kV line with the capacity of 500 MW runs from Southern Estonia to Russia, the transmission capacity of the same line in the Russia-Estonia direction is 400 MW. Also, 330 kV lines with the capacity of 750 MW run from Southern Estonia to Latvia.

There is a very strong power transmission infrastructure in all the three Baltic States, which is the only region in the European Union where there is no shortage of interconnection capacities. At the same time there are relatively few power connections between the Baltic States and other EU countries (the only connection is the 350 MW Estlink between Finland and Estonia). Since in essence there are no other connections with the market, the area can be viewed primarily as the Baltic electricity market, where Russia not belonging to the European Union and to some extent also Finland can participate.

Analogously with the power system the gas supply system has also been constructed during the period of the former Soviet Union and it formed historically part of the gas supply system of the Soviet Union of that time. Estonia has interconnections only with Russia and Latvia, which is

why Estonia is in the same situation as the other Baltic States and Finland, where there are no interconnections with the other Member States of the European Union and where the only source of supply is Russia.

The Second Strategic Energy Review<sup>47</sup> of the European Union published by the European Commission on 13 November 2008 points out the need to develop the energy infrastructure between the Member States in order to improve energy supply security of the Member States and the situation of energy security. The European Commission has made, among the priorities of the development of cross-border infrastructure, a proposal for the preparation of the Baltic Interconnection Plan (BIP), one of the objectives of which is to connect the Baltic States as an isolated energy market with the internal electricity and gas market of the European Union. The preparations for the Interconnection Plan started at the end of 2008 and will continue during the first half of 2009; the Plan should be completed by the Swedish EU Presidency (during the second half of 2009).

## 1.8. Energy Prices

Crude oil prices have increased significantly on the world market over the past few years due to rapid economic growth of the Asian countries and tensions in the Near-East and Africa. In connection with this the prices of other internationally traded energy carriers (mainly natural gas, coal, wood) and new energy facilities have increased. The launched emission trading has also had a significant impact on the energy prices in Europe.

In Estonia, the price increase of petroleum fuels and natural gas has given rise to the price increases of local energy resources (oil shale, wood). On a liberal energy market the sellers of energy sources maximise their income depending on the market situation. It is difficult to predict energy price for energy consumers on a liberal market, at the same time an efficiently operating market provides opportunity to receive offers from different energy sellers, which ensures better transparency of the market.

### Changes in Brent crude oil spot prices 1999–2008



Reference: Nordea e-Markets

<sup>47</sup> [http://ec.europa.eu/energy/strategies/2008/2008\\_11\\_ser2\\_en.htm](http://ec.europa.eu/energy/strategies/2008/2008_11_ser2_en.htm)

### Bensiini ja diiselmütuste hinnamuutused Rotterdamis 2002-2008 (ilma maksudeta)



Reference: Estonian Oil Stockpiling Agency

Estonia cannot influence the price of the energy carriers in the world, which is why ways have to be found so that these trends could bring profit to the state. The state of Estonia as the owner of the resources has increased the taxes related to the resources at a considerably high rate, but at a much slower rate than the rate of increase of energy prices on the world market.

Liberalisation of the electricity market will tie the electricity prices in Estonia more with the developments of the world market. The electricity market to be opened in 2013 will provide the consumers an opportunity to select electricity suppliers. In order to establish a justified energy price, sufficient competition shall be ensured between undertakings. On a too concentrated market (where the market share of one undertaking exceeds 40%) undertakings may start abusing their market position and push the prices up for a short period of time without good reason. Therefore it is necessary to organise energy markets in such a way that international competition and internal competition would not enable energy undertakings to manipulate with the price. At the same time international competition should not favour producers with unjustified competitive advantages from other countries.

Competitive advantages in the form of different supports have been created for renewable energy and cogeneration energy producers on open electricity markets, which in their turn increase the electricity price. The level of these prices shall ensure reasonable rate of return on investments and shall not create unjustified competitive advantages.

## 1.9. Trends of Regional Energy Markets

Upon the development of regional energy markets, Estonia cooperates actively with its neighbouring states. The objective of this cooperation is to ensure higher security of energy

supply and more efficient operation of the energy markets. Closer cooperation takes place with the other Baltic States and the Nordic countries.

At present the Baltic States use a diverse set of energy sources based mainly on the Estonian oil shale, Latvian hydro resources and Lithuanian nuclear energy, which are supplemented by imported natural gas and petroleum products and local and renewable energy sources, the use of which is gradually increasing. In addition to that, the underground gas storage in Latvia and the oil refinery in Mažeikiai are important facilities that help to ensure the security of energy supply in the Baltic States.

According to the Baltic Energy Strategy<sup>48</sup>, the objectives for increasing the security of energy supply of the Baltic States are integration of the power and natural gas systems into the energy systems of the European Union, construction of new production capacities, modernisation of power systems, construction of a liquefied natural gas and liquid gas terminal in the region, accelerated introduction of local and renewable energy sources, increasing of energy efficiency.

## 1.10. Assessment of the Estonian Energy Sector

SWOT analysis has been used below for assessing the Estonian energy sector.

<p><b>Strengths:</b></p> <ol style="list-style-type: none"> <li>1. Little dependency on the imported energy sources.</li> <li>2. A diverse set of energy sources in the primary energy supply.</li> <li>3. Energy production capacities are sufficient at present for satisfying the demand in Estonia.</li> <li>4. Existence of unique know-how in the energy sector.</li> <li>5. Well-functioning liquid fuel markets.</li> <li>6. An attractive liquid fuel transit route.</li> <li>7. Possibility to use alternative fuels.</li> <li>8. Adequately developed natural gas infrastructure (taking into account the possibilities to use the Latvian storage).</li> <li>9. Strong energy companies.</li> <li>10. Big renewable energy resources.</li> <li>11. Functioning legal environment and market supervision.</li> </ol>	<p><b>Weaknesses:</b></p> <ol style="list-style-type: none"> <li>1. Low energy efficiency in buildings, in the transport sector, in district heating systems and in the oil shale sector.</li> <li>2. Dominating share of oil shale in the energy balance.</li> <li>3. Small and influencable energy market.</li> <li>4. Insufficient financing of education, research and development.</li> <li>5. There is a dominating natural gas supplier on the market.</li> <li>6. Natural gas supply contracts with detrimental terms and conditions.</li> <li>7. The current low level of the use of liquid biofuels.</li> <li>8. The establishment of the security stockpile of liquid fuel has not been completed yet, thus, causing potential vulnerability in the case of supply disruptions.</li> <li>9. Transit/supply of politically influenced liquid fuels.</li> <li>10. The national analytical basis of the energy sector has been poorly developed.</li> <li>11. Insufficient/no power and gas connections between the Baltic region and the rest of the Member States of the European Union.</li> </ol>
<p><b>Opportunities:</b></p> <ol style="list-style-type: none"> <li>1. An efficient and transparent framework regulating long-term energy supply can be created by more clear political signals.</li> <li>2. An attractive investment environment can be</li> </ol>	<p><b>Threats:</b></p> <ol style="list-style-type: none"> <li>1. Deterioration of the security of energy supply.</li> <li>2. Insufficiency of the stimuli prescribed by the legislation of the states.</li> <li>3. Absence of common EU foreign policy in the</li> </ol>

<sup>48</sup> Baltic Energy Strategy <http://www.mkm.ee/index.php?id=9066>

<p>designed on the basis of adequate market prices.</p> <ol style="list-style-type: none"> <li>3. It is possible to increase the state's income from the international energy market by a more flexible energy taxation system.</li> <li>4. Making use of the existing energy conservation potential will reduce energy demand and the need for production capacities.</li> <li>5. Economically justified use of local and renewable energy sources available reduces energy dependency.</li> <li>6. New connections enable to reduce the risk of supply disruptions.</li> <li>7. Modernisation of the existing district heating systems for the purpose of the development of combined heat and power production.</li> <li>8. Introduction of new energy sources and technologies in due time.</li> <li>9. Potential construction of liquid gas and/or liquefied natural gas import-export terminal in the Baltic region.</li> <li>10. Development of the use of alternative fuels (shale oil, biofuels).</li> <li>11. More efficient use of liquid fuel storages.</li> </ol>	<p>energy sector (fragmentation of energy markets).</p> <ol style="list-style-type: none"> <li>4. Opposition of the local population and the local governments to new energy facilities.</li> <li>5. Vulnerability of energy systems and increase of energy prices caused by global trends.</li> <li>6. Slow modernisation of district heating systems.</li> <li>7. Shortage of qualified specialists.</li> <li>8. Risk of natural gas supply disruption.</li> <li>9. Increased dependency of the Baltic region on natural gas supply after closing of the Ignalina nuclear power plant.</li> <li>10. Concentration of the liquid fuel market.</li> <li>11. Potential disruptions in the supply of crude oil and the products thereof.</li> <li>12. Potential adverse environmental impact of liquid fuel transit or energy facilities bordering Estonia.</li> </ol>
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## 2. Development Plan

### 2.1. Vision and Mission

#### VISION

<p><b>The efficient and innovative energy sector supports the sustainable and balanced development of Estonia.</b></p>
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#### MISSION

The mission of the Estonian energy sector is to ensure **continuous, efficient, sustainable energy supply at a justified price and sustainable energy consumption.**

1. In order to ensure continuous energy supply, the use of energy sources shall be diversified by supporting, among others, local energy sources upon the production of energy. By 2020 the share of any energy source in the energy balance shall not exceed 50%. It is also important to have several strong energy supply channels from other states, reliable grids and to stockpile fuel and production capacity supplies in a reasonable amount.
2. In order to ensure sustainable energy supply and consumption, energy efficiency shall be improved by energy producers, transporters and consumers, the share of renewable energy sources and cogeneration shall be increased in the energy balance up to the optimal level, which does not cause damage to the environment. Estonia shall participate in the development of technologies for carbon-free combustion of fossil fuels. Upon the development of sustainable energy supply and consumption, the awareness of the public of the possible solutions and innovative technologies shall be increased and implementation of new solutions shall be promoted.
3. For the purpose of supply of energy at a justified price, regulations shall be developed, which would prevent market distortions and abuse of the market position by energy undertakings. At the same time the price of energy carriers shall lead to reasonable investments in energy conservation.

The activities directed at the export of energy products and know-how shall be in the interests of the Estonian population and create as big additional value as possible for the state of Estonia.

## 2.2. Structure of Objectives and Measures

Arising from the problems concerning the Estonian energy sector and based on the mission and vision of the policy of the energy sector, the objectives and measures of this Development Plan are as follows:

**1. Objective:** Continuous energy supply is ensured for the Estonian population.

**Measures:**

- 1.1. Diversification of energy supply through the construction of new connections and more even distribution of energy sources in the energy balance.
- 1.2. Supplementing legislation in the field of security of supply.
- 1.3. Coordination of implementation of the energy policy of local governments.
- 1.4. Cooperation with other Member States of the European Union for the purpose of the development of common foreign policy in the energy sector.
- 1.5. Establishment and maintenance of fuel stocks.

**2. Objective:** Energy supply and consumption is more sustainable in Estonia.

**Measures:**

- 2.1. Development of energy conservation.
- 2.2. Improvement of the efficiency of the use of oil shale.
- 2.3. Development of energy technologies.
- 2.4. Preparation and implementation of the activity plan of renewable energy.
- 2.5. Preparation and implementation of the national development plan of the heat sector.
- 2.6. Implementation of the new EU regulations concerning sustainable energy.

**3. Objective:** Energy supply at a justified price has been ensured for consumers.

**Measures:**

- 3.1. Elimination of competition deviations and market distortions on the energy market.
- 3.2. Development of optimal organisational arrangements for the development of the energy sector and emission trading.
- 3.3. Creation of knowledge in the field of nuclear energy and preparation and entry into force of the corresponding legislation.
- 3.4. Analysis of the alternatives of the taxation of the energy sector.
- 3.5. Promotion of education and research in the energy sector.

A draft implementing plan for 2009-2012 and an estimate of the cost up to 2020 has been prepared for the implementation of the Development Plan. The draft implementing plan is available on the homepage of the Ministry of Economic Affairs and Communications at <http://www.mkm.ee/index.php?id=321327>.

The planned cost of the abovementioned measures and activities shall be indicated by year in the implementing plan which shall be submitted to the Government of the Republic within three months after approval of the National Development Plan of the Energy Sector until 2020 by the Riigikogu. It is planned to finance the activities in the framework of the Development Plan of the Energy Sector presumably in the amount of approximately 32 billion kroons until 2020, including the cost of the measures in the total amount of 3,600,000 kroons in 2009, the total amount of 936,050,000 kroons in 2010, the total amount of 1,884,250,000 krooni in 2011, the total amount

of 1,683,150,000 in 2012 and the total amount of 27,709,600,000 kroons in the period from 2013 to 2020.

## 2.3. Strategic Objectives of the Energy Sector

Several objectives related to the energy sector have been established in different national development plans, which are set out in Annex 2. The strategic objectives established in addition for the achievement of the main objective of this Development Plan and the measures and activities planned for the achievement of these objectives are described below.

### 2.3.1. Measures for ensuring continuous energy supply

Objective 1	Continuous energy supply is ensured for the Estonian population	Baseline	Target
Indicator 1	There is no energy supply interruption in Estonia under normal conditions which would influence more than 10,000 consumers over 2 hours.	0 (2007) <sup>49</sup>	0 (2020)
Indicator 2	There is no energy supply interruption in Estonia caused by <i>force majeure</i> which would influence more than 20,000 consumers over 5 hours.	0 (2007) <sup>50</sup>	0 (2020)
Indicator 3	Increase of the satisfaction of consumers with the continuity of energy supply	67% (2007) <sup>51</sup>	85% (2011)

The following measures shall be taken in order to ensure continuous energy supply:

#### Measure 1.1

#### Diversification of energy supply through the construction of new connections and more even distribution of energy sources in the energy balance

#### BACKGROUND OF THE MEASURE

In 2005 oil shale formed 45% of the internal energy balance (i.e. excluding export of energy products) of Estonia. Such a big share of one fossil energy source in the state's energy balance is not practical due to energy security and climate considerations, since it is connected with the risks concerning security of supply, environmental protection and energy market. Therefore the share of other energy sources shall be increased in the energy balance and infrastructures shall be established for more extensive energy trading with the other Member States of the European Union; oil shale power industry shall, however, be developed in order to ensure security of supply.. One of the possibilities to diversify the energy portfolio is to develop nuclear power industry. The development of nuclear power industry is discussed in measure 3.3.

Preparation up the Baltic Interconnection Plan within 2009 in cooperation with the other Member States bordering the Baltic Sea and the European

<sup>49</sup>Reference: Estonian Competition Authority

<sup>50</sup> Reference: Estonian Competition Authority

<sup>51</sup> Reference: Annual Report of AS Eesti Energia 2007/2008

	Commission provides conditions for the development of the infrastructure of electricity and natural gas in the Baltic States, including by using EU co-financing upon financing important projects.	
<b>PERFORMANCE INDICATORS</b>	<ol style="list-style-type: none"> <li>1. The share of oil shale in the energy balance based on the demand in Estonia in 2020 (2007: 45%)</li> <li>2. The share of other energy sources in the Estonian energy balance in 2020 (2007: petroleum fuels 19.7%, natural gas 14.6%, wood 14.6%)</li> </ol>	<p>&lt; 30% (2020)</p> <p>each &lt;20% (2020)</p>
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Development and implementation of support schemes for renewable energy sources</li> <li>- Development and implementation of support schemes for cogeneration</li> <li>- Construction of new electricity infrastructures from the Baltic States to other EU countries</li> <li>- Construction of new natural gas infrastructures from the Baltic States to other EU countries</li> <li>- Construction of new liquid gas and/or liquefied natural gas infrastructures</li> </ul>	
	<b>Results and indicators</b>	<b>Target value or deadline</b>
<b>OUTPUT INDICATORS</b>	<ol style="list-style-type: none"> <li>1. The support scheme for renewable energy has been improved.</li> <li>2. The support scheme for cogeneration has been improved and implemented.</li> <li>3. New electricity connections, including Estlink 2, have been constructed from the Baltic States to other EU countries.</li> <li>4. New natural gas connections have been constructed from the Baltic States to other EU countries.</li> <li>5. New liquid gas and/or liquefied natural gas infrastructures have been constructed in the Baltic region.</li> </ol>	<p>2011</p> <p>2011</p> <p>2018 2014 (Estlink 2)</p> <p>2018</p> <p>2018</p>
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of the Environment, OÜ Põhivõrk, AS EG Võrguteenus	

### Measure 1.2

#### BACKGROUND OF THE MEASURE

<b>Supplementing legislation in the field of security of supply</b>
In Estonia the security of supply and the quality of network services are regulated by the subordinate legislation of the Electricity Market Act, the Natural Gas Act, the Liquid Fuel Stocks Act and the District Heating Act. Most of the requirements of these Acts are complied with by the undertakings already.

<b>PERFORMANCE INDICATORS</b>	1. Improvement of the quality indicators of network services	by 10% (2015) <sup>52</sup>
	<ul style="list-style-type: none"> <li>- Analysis of the provisions concerning security of supply of legislation regulating the energy sector and adequacy of the effect thereof</li> <li>- Preparation up and entry into force of necessary amendments to legislation</li> </ul>	
<b>MOST IMPORTANT ACTIVITIES</b>	<b>Results and indicators</b>	
	<b>Target value or deadline</b>	
<b>OUTPUT INDICATORS</b>	<ol style="list-style-type: none"> <li>1. Analysis completed</li> <li>2. Amendments to legislation have been submitted to the Government of the Republic; the amendments have entered into force</li> </ol>	December 2009 July 2010
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, network operators, Estonian Competition Authority	

### Measure 1.3

#### BACKGROUND OF THE MEASURE

#### Coordination of implementation of the energy policy of local governments

The objective of the local governments and county governments in the energy sector is to direct the implementation of the national energy policy on the local level. The national energy policy trends and the planned changes often do not reach the local level at present and the ministries do not have information concerning the problems and trends of the local level. For years the Ministry of Economic Affairs and Communications has organised information days for the representatives of county governments once a year. The Ministry will continue the organisation of information days in cooperation with the Estonian Competition Authority until the establishment of the planned organisational structure, which will continue and expand informing in the field of energy policy at the level of county governments and local governments. The establishment of the corresponding structure is planned as an activity of measure 3.2..

#### PERFORMANCE INDICATORS

1. The percentage of local governments (all the local governments), whose representative has attended the energy policy information days (2007: 63%)	Increasing trend
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#### MOST IMPORTANT ACTIVITIES

- Informing in the field of energy policy through the organisational structure to be established that will be engaged in the development of the energy sector and emission trading
- Specification of the functions of the county energy advisor

#### OUTPUT INDICATORS

<b>Results and indicators</b>		<b>Target value for 2020 or deadline</b>
1. Information days for employees of county and local governments engaged in the energy		Since 2010

<sup>52</sup> Quality Indicators of Network Services on the homepage of the Estonian Competition Authority <http://www.konkurentsiamet.ee/?id=10976>

<p>sector organised by the organisational structure to be established take place once in a quarter.</p> <p>2. The functions of a county energy advisor have been set out and are complied with.</p>	<p>July 2009</p>
<p><b>RESPONSIBLE</b> Ministry of Economic Affairs and Communications, Ministry of the Interior, Association of Estonian Cities, Association of Municipalities of Estonia</p>	

**Measure 1.4**

<p><b>Cooperation with other Member States of the European Union for the purpose of the development of common foreign policy in the energy sector</b></p>	
<p><b>BACKGROUND OF THE MEASURE</b></p> <p>One of the most important priorities of the European Union is to develop foreign policy of the energy sector, which would be the basis in relations with third countries. Such a common policy document shall definitely take into account the interests of the Estonian energy security and be based on the provisions of the Baltic Energy Strategy. The bases of the security policy of Estonia<sup>53</sup> concerning the energy sector shall be updated on an ongoing basis.</p>	<p><b>PERFORMANCE INDICATORS</b></p> <p>1. Estonian interests are protected in the EU energy policy</p>
<p><b>MOST IMPORTANT ACTIVITIES</b></p> <ul style="list-style-type: none"> <li>- Clear and effective expression of the interests of Estonia upon the development of the EU foreign policy in the energy sector</li> <li>- Updating of the bases of the security policy of Estonia concerning the energy sector on an ongoing basis</li> </ul>	<p><b>RESULTS AND INDICATORS</b></p>
<p><b>OUTPUT INDICATORS</b></p> <p>1. The common EU foreign policy document in the energy sector taking account of the interests of Estonia has been approved.</p> <p>2. The bases of the security policy of Estonia concerning the energy sector have been updated</p>	<p><b>TARGET VALUE FOR 2020 OR DEADLINE</b></p> <p>July 2009</p>
<p><b>RESPONSIBLE</b> Ministry of Foreign Affairs, Ministry of Defence, Ministry of Economic Affairs and Communications, State Chancellery, Ministry of the Environment</p>	

**Measure 1.5**

<p><b>Establishment and maintenance of fuel stocks</b></p>	
<p><b>BACKGROUND OF THE MEASURE</b></p> <p>The Estonian Oil Stockpiling Agency, which commenced its activities in 2005, has continuously completed the stocks in compliance with the requirements provided for in the EU accession treaty and the Liquid Fuel Stocks Act and has ensured efficient maintenance of these stocks. Estonia shall have ensured 90 days' liquid fuel stocks by 2010 based on the average</p>	

<sup>53</sup> The Bases of the Security Policy of the Republic of Estonia <http://www.mod.gov.ee/?op=body&id=119>

	<p>consumption of the previous year. In addition to that it shall also be kept in mind that the liquid fuel stocks shall comply with the obligations arising from accession to OECD and the International Energy Agency (IEA) and legislation shall be supplemented correspondingly.</p> <p>In connection with the terms and conditions of accession to IEA, a programme shall be developed and approved for limiting liquid fuel consumption in the case of serious supply shortages. Alongside with this legislation shall be supplemented arising from the obligation to participate in the Emergency Sharing System (ESS) and Co-ordinated Emergency Response Measures (CERM) and the obligation to communicate information.</p> <p>Also, the need to establish a legislative requirement for the establishment of gas fuel and other fuel stocks shall be analysed.</p>	
<b>PERFORMANCE INDICATORS</b>	<ol style="list-style-type: none"> <li>1. The liquid fuel stocks complying with the EU requirements have been established and are maintained.</li> <li>2. The liquid fuel stocks complying with the IEA requirements have been established and are maintained.</li> </ol>	<p>January 2010</p> <p>2012</p>
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Analysis of the needs for the establishment of supplementary stocks arising from the IEA requirements</li> <li>- Establishment of the liquid fuel stocks complying with the EU requirements</li> <li>- Establishment of the liquid fuel stocks complying with the IEA requirements</li> <li>- Development of a programme for limiting the consumption of liquid fuels in the case of serious supply shortages in compliance with the terms and conditions of IEA</li> <li>- Analysis of legislation proceeding from accession to IEA and amendment of legislation, if necessary</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT INDICATORS</b>	<ol style="list-style-type: none"> <li>1. Analysis concerning the need to establish supplementary stocks arising from the IEA requirements has been completed.</li> <li>2. Liquid fuel stocks complying with the EU requirements have been established.</li> <li>3. Liquid fuel stocks complying with the IEA requirements have been established.</li> <li>4. A programme for limiting the consumption of liquid fuels in the case of serious supply shortages complying with the terms and conditions of IEA has been developed and approved; in the future the programme shall be updated periodically.</li> <li>5. Analysis of legislation proceeding from accession to IEA has been completed and</li> </ol>	<p>January 2011</p> <p>2010</p> <p>2012</p> <p>2010</p> <p>2010</p>

**RESPONSIBLE**

legislation has been amended, if necessary.	
Estonian Oil Stockpiling Agency, Ministry of Economic Affairs and Communications	

### 2.3.2. Measures for ensuring sustainable energy supply and consumption

<b>Objective 2</b>	<b>Energy supply and consumption is more sustainable in Estonia</b>	Baseline	Target
<b>Indicator 1</b>	Increasing of the share of renewable energy in the final consumption of energy	17.5% (2006) <sup>54</sup>	25% (2020)
<b>Indicator 2</b>	Increasing of the share of cogeneration in the gross consumption of electricity	10.2% (2007) <sup>55</sup>	20% (2020)
<b>Indicator 3</b>	As a result of the energy conservation measures applied in the state the total of 9.8PJ is saved in 2016 (i.e. 9% of the average consumption of the years 2001–2005 arising from Directive 2006/32/EC)	5TJ (2007) <sup>56</sup>	9.8PJ (2016)
<b>Indicator 4</b>	Reduction of network losses (losses as a ratio to gross production)	Electricity 11.1% (2007) Heat 10.6% (2007) <sup>57</sup>	Decreasing trend
<b>Indicator 5</b>	Reduction of the amount of primary energy used for Estonian internal demand	124,438 TJ (2007) <sup>58</sup>	Decreasing trend
<b>Indicator 6</b>	The share of fuels based on renewable energy sources forms 10% of transport fuels in 2020.	0.06% (2007) <sup>59</sup>	10% (2020)
<b>Indicator 7</b>	CO <sub>2</sub> emissions of the energy sector have decreased twice in 2020 compared to 2007.	15.7 million t (2007) <sup>60</sup>	7.85 million t (2020)

#### Measure 2.1

##### BACKGROUND OF THE MEASURE

##### Development of energy conservation

The following national development documents contribute to sustainable energy use in the corresponding field:

1. Energy Conservation Target Programme for 2007- 2013,
2. Estonian Housing Development Plan for 2008-2013,
3. Transport Development Plan for 2006–2013,
4. Development Plan for Enhancing the Use of Biomass and Bioenergy for 2007–2013

<sup>54</sup> Reference: Statistics Estonia

<sup>55</sup> Reference: Statistics Estonia

<sup>56</sup> Reference: Energy Conservation Target Programme for 2007- 2013

<sup>57</sup> Reference: Statistics Estonia

<sup>58</sup> Reference: Statistics Estonia

<sup>59</sup> Reference: Ministry of Finance 2008, Monitoring Report Concerning State Aid for Biofuels

<sup>60</sup> Reference: Estonian Action Plan for Economic Growth and Employment for 2008- 2011

	<ol style="list-style-type: none"> <li>5. National Development Plan for the Use of Oil Shale for 2008–2015</li> <li>6. Development Plan of the Estonian Electricity Sector until 2018</li> <li>7. Estonian Environmental Strategy until 2030</li> <li>8. Estonian Action Plan for Economic Growth and Employment for 2008- 2011</li> </ol> <p>These documents set out detailed objectives, action plans and implementing plans (see Annex 2). The main priority is to inform the population of the possibilities to save energy and the economic and environmental impacts thereof and to help to make decisions and investments which promote energy conservation in the business, state and private sector. The most important activities in the area of energy conservation in the abovementioned development documents are: improvement of the availability of information concerning energy conservation, ensuring the existence of experts in the field of energy conservation, supporting expert assessment and energy audits of constructions in apartment buildings (Energy Conservation Target Programme); supporting reconstruction and renovation work of apartment buildings directed at energy conservation (Housing Development Plan); supporting investments in the renovation of the heating lines of district heating networks (structural funds); optimisation of oil shale extraction capacities (Development Plan for the Use of Oil Shale); creation of favourable conditions for the development of domestic biomass and bioenergy (Development Plan for Enhancing the Use of Biomass and Bioenergy); stimulation of the use of environment-friendly technologies (Transport Development Plan).</p>	
<b>PERFORMANCE INDICATORS</b>	1. All the objectives established in the development documents have been achieved by the due date.	2020
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Implementation of the measures related to energy conservation set out in the established development plans of the corresponding sector (see Annex 2)</li> <li>- Supplementing of the Energy Conservation Target Programme for 2007- 2013</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT INDICATORS</b>	<ol style="list-style-type: none"> <li>1. The energy conservation measures established in the development plans of the respective sector have been implemented.</li> <li>2. The Energy Conservation Target Programme for 2007- 2013 has been supplemented.</li> </ol>	In compliance with the provisions of the development plan of the respective sector 2010
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of the Environment, Credit and Export Guarantee Fund KredEx	

**Measure 2.2.**

**Improvement of the efficiency of the use of oil shale**

**BACKGROUND  
OF THE  
MEASURE**

Production of electricity from oil shale shall be continued in the interests of energy security of Estonia, but this should be carried out in a more environment-friendly way. More strict environmental requirements shall be applied gradually to oil-shale-fired power plants. In order to comply with the requirements, the plants shall invest in new technologies, the development of infrastructures and purification equipment. Granting of state aid to Narva Power Plants may be necessary for the construction of the equipment.

The maximum annual capacity of oil shale extraction in Estonia provided in the National Development Plan for the Use of Oil Shale is 20 million tons with an objective to reduce it to 15 million tons. According to the trends of the Development Plan of the Electricity Sector, up to 10 million tons of oil shale is used annually for the production of oil shale electricity and shale oil for Estonia; this amount will decrease to a significant extent after the completion of a potential nuclear power station.

In order to achieve this, the technologies of electricity production shall be modernised and the efficiency of the use of shale oil and gas upon the production of electricity shall be studied. Potential importing of electricity through new connections on an open electricity market would reduce significantly the need to use oil shale for the production of electricity; however, by using oil shale for wind power balancing production capacities may increase the share of oil shale.

As for the oil shale ash generated upon the production of electricity from oil shale, the maximum possible recovery of the oil shale ash shall be ensured and the minimum environmental impact of depositing and environmental safety shall be ensured upon depositing.

The amount of oil shale remaining from electricity production can be sold in accordance with the world market demand. The products produced from Estonian oil shale should be sold by maximising from both, the company and the state revenue resources by applying also new technologies. The experience of Estonia upon the production of shale oil and oil shale chemicals is of more and more interest on the world market, this knowledge shall also be sold.

**PERFORMANCE  
INDICATORS**

1. The amount of oil shale used remains below the amount provided for in the Development Plan for the Use of Oil Shale (15 million tons by 2015).	2020
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**MOST  
IMPORTANT  
ACTIVITIES**

- Setting out the extent and principles of granting state aid for the construction of new units by the necessary contracts
- Construction of two new fluidised bed combustion units
- Installation of desulphurisation and denitrification systems
- Implementation of the National Development Plan for the Use of Oil Shale for 2008–2015
- Increasing the recovery of oil shale ash

	- Increasing the environmental safety of depositing of oil shale ash - Contributing to spreading knowledge concerning oil shale in the world	
<b>OUTPUT INDICATORS</b>	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
	1. The principles and contracts of state aid have been set out.	July 2010
	2. The new fluidised bed combustion units have been constructed.	2015
	3. Purification equipment has been installed in old units continuing operation.	2015
	4. The National Development Plan for the Use of Oil Shale has been implemented.	2015
	5. The share of the recovery of oil shale ash has increased (2007: 3.8% of the total amount)	3 times higher
	6. Depositing of oil shale ash complies with the requirements	2010
<b>RESPONSIBLE</b>	Narva Power Plants, Ministry of the Environment, Ministry of Economic Affairs and Communications	

### Measure 2.3

#### BACKGROUND OF THE MEASURE

	<b>Development of energy technologies</b>
	<p>The equipment used currently for the production of shale oil and gas have been developed before 1980, some equipment originate from 1930. As a result of development work several new more efficient technical solutions have been developed, but large-scale production thereof has not been started yet. Also, post-treatment of oil shale products shall be developed with an objective to expand the areas of use thereof. The outdated technologies with big environmental impact shall be discarded after the application of the new solutions.</p> <p>In November 2007, the Government of the Republic approved the principles of the Energy Technology Programme. On 18 December 2008 the Government of the Republic approved the Energy Technology Programme updated by the programme committee. The priority areas of development set out in the programme are the following:</p> <p>1. Development of oil shale technologies, including:</p> <ul style="list-style-type: none"> <li>• Environmentally sound extraction of oil shale without losses</li> <li>• Development of CO<sub>2</sub> – free oil shale electricity production</li> <li>• Development of a gas turbine using shale oil and/or liquid biofuel for regulating electrical capacity</li> <li>• Development of new shale oil production technology</li> <li>• Development of combined shale oil and electricity production technology</li> <li>• Production of diesel fuel or the components thereof from oil shale</li> <li>• Development of the areas of application of the waste generated upon processing of oil shale – ash, mine waste</li> <li>• More efficient use of heat resource</li> </ul>

	<ul style="list-style-type: none"> <li>• Verification of technologies in compliance with the EU scheme</li> </ul> <p>2. Development of new technologies based mainly on renewable energy sources, including:</p> <ul style="list-style-type: none"> <li>• Solar energy</li> <li>• Fuel cells and electrolysers</li> <li>• Development and application of the production technology of second-generation biofuels</li> <li>• Development of electrical energy storage and wind power balancing technologies</li> <li>• Development of energy technologies based on the treatment of biomass and biodegradable waste</li> <li>• Development of the transmission and distribution networks and optimisation of the energy system</li> </ul> <p>The programme is managed by the programme manager, who coordinates the projects of the relevant sector with different implementing agencies. Arising from the need to create knowledge in the field of nuclear energy, the Energy Technology Programme shall also be supplemented with the corresponding activity.</p>	
<b>PERFORMANCE INDICATORS MOST IMPORTANT ACTIVITIES</b>	1. Post-treatment of shale oil is functioning.	2016
	<ul style="list-style-type: none"> <li>- Development of shale oil and chemicals post-treatment technologies</li> <li>- Promotion of application of more efficient shale oil and gas production equipment</li> <li>- Carrying out projects of the programme of oil shale technologies and new technologies based mainly on renewable energy sources</li> <li>- Supplementing the Energy Technology Programme with the priority development trend of nuclear energy</li> </ul>	
<b>OUTPUT INDICATORS</b>	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
	<ol style="list-style-type: none"> <li>1. The development of at least 3 new oil shale technologies has been supported<sup>61</sup>.</li> <li>2. New equipment has been put into operation.</li> <li>3. The Energy Technology Programme achieves the objectives and interim objectives approved by the Government of the Republic.</li> <li>4. The Energy Technology Programme has been supplemented with the nuclear energy trend.</li> </ol>	<p>2015</p> <p>2012</p> <p>Since 2009</p> <p>March 2009</p>
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of the Environment, Enterprise Estonia, universities, energy undertakings	

<sup>61</sup> Development trends in oil shale technologies, Estonian Energy Technology Programme  
<http://www.hm.ee/index.php?03242>

<b>Measure 2.4</b>	<b>Preparation and implementation of the activity plan of renewable energy</b>	
<b>BACKGROUND OF THE MEASURE</b>	Arising from the proposed Renewable Energy Directive, each Member State shall prepare a renewable energy activity plan, which shall set out activities for the achievement of the objectives and interim objectives established by the Directive. The Member States are intended to update the plan also, if they fail to achieve the established interim objectives concerning renewable energy. This activity plan shall, among others, map the potential areas in Estonia for the production of renewable energy and provide guidelines for making use of the potential of renewable energy more effectively. By now the Development Plan for Enhancing the Use of Biomass and Bioenergy has been prepared, which directs the aspects of the production of bioresource. The principles of the use of liquid biofuels in transport are under discussion at the EU level. Taking into account the regulations concerning the liquid biofuels used in transport arising from the Renewable Energy Directive, the relevant sector shall be regulated also in Estonia.	
<b>PERFORMANCE INDICATORS</b>	1. Estonia has achieved all the objectives and interim objectives concerning renewable energy arising from the proposed Directive <sup>62</sup>	Until 2020
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Initiation and preparation of the Renewable Energy Activity Plan</li> <li>- Approval of the Renewable Energy Activity Plan</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT INDICATORS</b>	<ul style="list-style-type: none"> <li>1. The Renewable Energy Activity Plan has been prepared.</li> <li>2. The Renewable Energy Activity Plan has been approved.</li> </ul>	<ul style="list-style-type: none"> <li>April 2010</li> <li>July 2010</li> </ul>
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of the Environment, Ministry of Agriculture	

<b>Measure 2.5</b>	<b>Preparation and implementation of the national development plan of the heat sector</b>	
<b>BACKGROUND OF THE MEASURE</b>	District heating is used widely in Estonia, at the same time several problems have arisen upon the development of market relations in this sector (the issues of price coordination, the impact of the monopolistic character of the market, the impact of local governments on price formation, the indicators of efficiency, etc.). The relatively high dependency of district heating on natural gas (over 48% in 2006) and the substantial price increase of district heating arising from the prices of energy carriers causes the need to diversify energy sources. At the same time in several areas district heating undertakings are not able to make the required investments. The extent of the types of local heat production (heat pumps, local and imported energy sources) and the desired development trends shall be	

<sup>62</sup> Renewable Energy Directive [http://ec.europa.eu/climateaction/key\\_documents/index\\_en.htm](http://ec.europa.eu/climateaction/key_documents/index_en.htm)

	defined more clearly in the development plan of the heat sector.	
<b>PERFORMANCE INDICATORS</b>	1. More balanced shares of energy sources upon the production of heat (2007: 46% natural gas).	The share of one energy source does not exceed 30% (2020)
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Mapping and analysis of the problems of the district heating sector</li> <li>- Initiation and preparation of the development plan of the heat sector</li> <li>- Amendment of the District Heating Act</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT INDICATORS</b>	<ol style="list-style-type: none"> <li>1. Analysis has been completed,</li> <li>2. The development plan has been prepared and approved.</li> <li>3. Amendments to the District Heating Act have been submitted to the Government of the Republic.</li> </ol>	<p>January 2010 December 2011</p> <p>September 2009</p>
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of the Interior, Ministry of the Environment, Estonian Competition Authority, Association of Estonian Cities, Association of Municipalities of Estonia, by involving interest groups	

#### Measure 2.6

	<b>Implementation of the new EU regulations concerning sustainable energy</b>	
<b>BACKGROUND OF THE MEASURE</b>	Regulations for the provision of requirements for the eco-design and energy efficiency of several equipment are under preparation in the European Union, upon the transposition of which the efficiency requirements shall be established for different equipment using energy.	
<b>PERFORMANCE INDICATORS</b>	1. Estonia complies with the efficiency requirements for different equipment using energy provided for in the EU regulations concerning eco-design and energy efficiency of equipment.	2020
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Transposition of Directives and implementation of Regulations</li> <li>- Analysis of the efficiency of the equipment used; if necessary, making amendments arising therefrom</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT INDICATORS</b>	<ol style="list-style-type: none"> <li>1. The Directives have been transposed and the Regulations have been implemented by the due date.</li> <li>2. The analysis has been completed; if necessary, amendments arising therefrom have been made.</li> </ol>	July 2012
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications	

### 2.3.3. Measures for ensuring justified energy price

<b>Objective 3</b>	<b>Energy supply at a justified price has been ensured for consumers</b>	Baseline	Target
<b>Indicator 1</b>	In 2015, the rate of return on investments of energy undertakings (WACC of network operators) is at the average level of similar EU undertakings.	WACC= 6.77 (2007) <sup>63</sup>	WACC <sub>EL</sub> 2015
<b>Indicator 2</b>	The share of the energy sector in the GDP is below the level of 2005.	3% (2005) <sup>64</sup>	<3% (2018)

#### Measure 3.1

##### BACKGROUND OF THE MEASURE

##### PERFORMANCE INDICATORS

##### MOST IMPORTANT ACTIVITIES

##### OUTPUT INDICATORS

##### RESPONSIBLE

<b>Elimination of competition deviations and market distortions on the energy market</b>	
Significant competition deviations and market distortions have occurred in several states upon the liberalisation of energy markets. As a result of the deviations and distortions the markets are unjustly concentrated and some undertakings have become unjustly enriched. In order to ensure efficient operation of the market, open and transparent operation and efficient supervision of the energy market shall be ensured.	
1. Decreasing number of interferences with competition related to undertakings of the energy sector (2008: 1)	2020 0
<ul style="list-style-type: none"> <li>- Continuous analysis of the functioning of the energy market</li> <li>- Amendment of legislation, if necessary</li> </ul>	
<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
1. Analysis of the functioning of the energy market has been completed.	annually
2. Amendments have been made to the legislation, if necessary.	as required
Estonian Competition Authority, Ministry of Economic Affairs and Communications	

#### Measure 3.2

##### BACKGROUND OF THE MEASURE

<b>Development of optimal organisational arrangements for the development of the energy sector and emission trading</b>
In Estonia, several different foundations are engaged in the development activities of the energy sector: Enterprise Estonia – EAS (Estonian Energy Technology Programme), the Credit and Export Guarantee Fund KredEx (supporting projects of energy efficiency of buildings, energy audits), the

<sup>63</sup> Reference: “Estonian Electricity and Gas Market Report 2008“, Estonian Competition Authority - WACC-weighted average cost of capital

<sup>64</sup> Reference: Statistics Estonia

Environmental Investments Centre – EIC (supports for investments in the energy sector). An optimal organisational solution shall also be developed for the preparation of the auctioning system of emission allowances trading starting from 2013, the organisation of the auctions and for using part of the revenues received as a result of the auctions for granting state aid for energy consumers and producers. An operational solution shall be found for more effective and efficient fulfilment of the abovementioned tasks, taking, among others, into account the division of roles between the public sector and the private sector.

Arising from this it shall be ensured that the local governments are regularly and effectively informed of the development trends of the national energy policy, of the functions of the local governments related to the national energy policy and the possibilities for effective implementation thereof. The main functions for the performance of which an optimal solution shall be found are the following:

- a. continuous detailed analysis of the trends of the energy sector;
- b. improvement of awareness concerning energy efficiency in the industry and services sectors and in the public sector,
- c. analysis of energy audits and implementation of the approved proposals arising therefrom;
- d. management of the energy technology programme;
- e. coordination of the national energy policy in cooperation with the county governments and local governments;
- f. organisation of emission allowances auctions from 2013;
- g. cooperation with energy agencies performing similar functions in other states and with the International Energy Agency;
- h. granting state aid to energy consumers and producers, if necessary.

**MOST  
IMPORTANT  
ACTIVITIES**

- Development of alternative solutions of the organisational arrangements of the tasks, selection of the optimal solution
- If necessary, updating the legal framework required for introducing the optimal organisational solution, ensuring effective functioning of the solution
- Development and implementation of the principles of emission allowances auctions and distribution of revenue

**OUTPUT  
INDICATORS**

<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
1. The most optimal solution has been selected from the organisational arrangement solutions; the arising description of functions has been submitted to the Government of the Republic for approval in principle.	January 2010
2. The organisational structural unit has been established.	July 2010
3. The principles of emission allowances auctions and distribution of revenue have been developed and implemented.	2012

<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of the Environment, Ministry of Finance
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**Measure 3.3**

**BACKGROUND OF THE MEASURE**

**Creation of knowledge in the field of nuclear energy and preparation and entry into force of the corresponding legislation**

Nuclear power engineering as one of the economically most efficient potential options for covering the Estonian electricity demand after 2020 presumes substantial political preliminary work at the state level, the development of the people who undergo the corresponding training and the establishment of the legal basis. Regardless of the decision concerning the construction of a nuclear power plant, legislation shall be established which would provide for the conditions and process of the construction of a nuclear power plant in Estonia and the establishment of the required structures, if necessary. The activities of the measure shall be planned in the framework of the Energy Technology Programme.

**PERFORMANCE INDICATORS**

1. The legal basis for nuclear energy has been established.	2012
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**MOST IMPORTANT ACTIVITIES**

- Establishing the speciality of nuclear power engineering in the power engineering study programme
- Mapping of the need for legislation in the field of nuclear energy
- Preparation and submission of draft legal acts in the field of nuclear energy and/or amendments thereto to the Government of the Republic
- Approval of the legal acts in the field of nuclear energy by the Riigikogu

**OUTPUT INDICATORS**

<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
1. The speciality of nuclear power engineering has been established in the study programmes of Estonian educational institutions.	2011 July 2009
2. The need for legislation in the field of nuclear energy has been mapped.	December 2010
3. The draft legal acts in the field of nuclear energy and or motions to amend the legal acts have been prepared and submitted to the Government of the Republic.	2012
4. The legal acts in the field of nuclear energy have been adopted.	

**RESPONSIBLE**

Ministry of Economic Affairs and Communications, Ministry of the Environment, Ministry of Social Affairs, Ministry of Education and Research, Ministry of the Interior, Ministry of Defence, Ministry of Foreign Affairs, Ministry of Justice

**Measure 3.4**

**BACKGROUND OF THE**

**Analysis of the alternatives of the taxation of the energy sector**

Energy and environmental taxes have a significant impact on the development trends of the energy sector. The current principles of taxation

<b>MEASURE</b>	shall be valid until the end of 2009. In connection with the application of the new principles of emission trading from 2013, the combined effect thereof with the valid taxation system shall be analysed. In order to finance the abovementioned analysis, it is planned to apply for financial resources from the Fund of Wise Decisions.	
<b>PERFORMANCE INDICATORS</b>	1. The principles of the combined effect of the emission trading and taxation system have been updated.	2011
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Analysis of the combined effect of the new principles of emission trading launched from 2013 and the existing taxation system</li> <li>- Preparation of the required amendments to legislation</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT INDICATORS</b>	1. Analysis of the combined effect of the new principles of emission trading and the existing taxation system has been completed.	April 2011
	2. Motions to amend legal acts have been submitted to the Government of the Republic.	2011
<b>RESPONSIBLE</b>	Ministry of Economic Affairs and Communications, Ministry of Finance, Ministry of the Environment	

### Measure 3.5

	<b>Promotion of education and research in the energy sector</b>	
<b>BACKGROUND OF THE MEASURE</b>	The popularity of the field of power engineering has increased year by year, however, the present number of persons who complete vocational training, Bachelor's and Master's study in this field is not sufficient to ensure the required number of employees in the energy sector. At the same time the state has not mapped clearly state commissioned education. Now state commissioned education can be provided for more clearly in the light of the trends of the development plans. The activities of the measure shall be planned within the framework of the Energy Technology Programme.	
<b>PERFORMANCE INDICATORS</b>	1. The number of persons who have completed Master's study in power engineering is twice as big in 2015 as in 2007 ( 2007: 154 faculty of power engineering at the Tallinn University of Technology + thermal power engineering at the Tallinn University of Technology + Estonian University of Life Sciences)	308 (2015)
<b>MOST IMPORTANT ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Analysis of state commissioned education in the field of power engineering</li> <li>- Preparation and provision of state commissioned education in the field of power engineering at the universities</li> </ul>	
	<b>Results and indicators</b>	<b>Target value for 2020 or deadline</b>
<b>OUTPUT</b>	1. Analysis has been completed.	2010

**INDICATORS**

2. State commissioned education has been formed and updated periodically.

2011, hereafter periodically

**RESPONSIBLE**

Ministry of Education and Research, Ministry of Economic Affairs and Communications

### **3. Monitoring and Management of Implementation of the Development Plan**

The description of the management structure of the Development Plan of the Energy Sector has been prepared pursuant to Regulation No 302 of the Government of the Republic of 13 December 2005 “Types of Strategic Development Plans, the Procedure for Their Preparation, Amendment, Implementation and Evaluation and Reporting Procedure”.

The Government of the Republic appointed the Ministry of Economic Affairs and Communications as a ministry responsible for the preparation of the Development Plan of the Energy Sector. The function of the Ministry of Economic Affairs and Communications is to coordinate the preparation, amendment, implementation, evaluation and reporting of the Development Plan. Pursuant to subsection 12 (6) of the Sustainable Development Act, the Development Plan of the Energy Sector as an essential national issue is subject to approval in the Riigikogu.

An implementing plan shall be appended to the Development Plan of the Energy Sector, which shall at first be prepared for the years 2009–2012 and which shall be submitted to the Government of the Republic by the Minister of Economic Affairs and Communications within three months after approval of the Development Plan by the Riigikogu.

Pursuant to Regulation No 302 of the Government of the Republic, once a year the Minister of Economic Affairs and Communications shall submit to the Government of the Republic a report on the implementation of the Development Plan of the Energy Sector, the achievement of the objectives established in the development plan and implementing plan and the effectiveness of the application of the measures, according to which it shall be decided whether the development plan shall be supplemented or terminated.

The Development Plan of the Energy Sector shall be implemented on the basis of a periodically updated implementing plan, which shall set out the specifics, the extent and organisational arrangements of the measures to be implemented at first by measures planned for the first four years.

The Development Plan shall be implemented through the activities of the Ministry of Economic Affairs and Communications, the Ministry of the Environment, the Ministry of Social Affairs, the Ministry of Education and Research, the Ministry of Finance, the Ministry of the Interior, the Ministry of Foreign Affairs, the Ministry of Justice, the Estonian Competition Authority, OÜ Põhivõrk, AS EG Võrguteenus, the Estonian Oil Stockpiling Agency and Narva Power Plants and in cooperation with the Association of Estonian Cities, the Association of Municipalities of Estonia, the National Audit Office of Estonia, the undertakings and interest groups.

#### **3.1. Owner Policy of the State in the Energy Sector**

The owner policy of the state of Estonia in the energy sector shall ensure the protection of the interests of the state in strategic issues. The state shall consequently have control in the most important strategic undertakings.

## **Electricity sector**

Pursuant to the Electricity Market Act, ensuring electricity supply of the state is the function of the system operator (OÜ Põhivõrk). The right and obligation to control the operation of the power system and to ensure sufficient electricity production capacities, to organise competitions for the construction of new production capacities, if necessary, have been granted to and imposed on the system operator by legislation. The new draft Electricity Market Directive under preparation prescribes proprietary distinction of the system operator in order to ensure as high independence of the activity of the system operator as possible.

The system operator shall treat all the market participants equally and honestly. Although the activity of OÜ Põhivõrk has been assessed as independent and transparent in various analyses, there is always an increased risk of influencing the decisions in the case of a system operator belonging to a group. Since the system operator belongs to the group of one market participant (Eesti Energia AS), independence is not always ensured, especially in a situation, where the group may be partially owned by private capital in future.

Therefore it is rational to bring OÜ Põhivõrk from the group of Eesti Energia AS 100% into direct state ownership by 2010, by ensuring that the financial capability of the group will not deteriorate thereby. In order to ensure independence, it shall be ensured that there would be no conflict of interests at the level of the general meeting. Pursuant to the indicative schedule it is planned to bring OÜ Põhivõrk 100% into state ownership in 2010.

## **Natural gas**

It is also important to ensure independence of the transmission network operator from the sellers on the natural gas market, although in the conditions of Estonia competition is significantly limited on this market. Competition on this market can be increased by the construction of terminals of liquefied natural gas and liquid gas. The draft amending the Natural Gas Directive under preparation prescribes proprietary distinction of the system operator as the main option.

Therefore possibilities shall be sought also for the distinction of the proprietary relations of the natural gas system operator. In order to do that, different options for increasing the independence of the system operator shall be analysed.

## **Heat sector**

The specificity of the Estonian district heating undertakings compared to other states is a relatively big share of private capital on the district heating market. As a rule, the contribution of private capital has been justified itself, but the total privatisation of the district heating sector has created private monopolies, which have started to protect strongly their positions without increasing efficiency.

The most important problem of the heat sector is the dependence of the consumers on the investments made by the undertakings, which do not direct the undertakings to find cheaper solutions, but to protect their market from potential cheaper solutions. Legislation, which does

not give the undertakings an indication for seeking better solutions and through this for increasing the value of an undertaking, is definitely also a problem.

In the district heating sector it is rational not to privatise the district heating undertakings totally, but to maintain the holding of the local governments in these undertakings.

### **Fuel market**

On the liquid fuel market it is important to ensure the liquid fuel stocks in the case of difficulties of supply on the world market, complying thereby with the international regulations. The state shall maintain 100% ownership of the Estonian Oil Stockpiling Agency established for that purpose in order to have control over the existence and location of the stocks.

On the oil shale market the options of the ownership of AS Eesti Põlevkivi shall be analysed. Most of the rights of oil shale extraction belong to AS Eesti Põlevkivi, but different undertakings, including the subsidiary undertakings of Eesti Energia AS who is 100% owner of AS Eesti Põlevkivi, are engaged in the processing. The ownership and structure of the undertaking shall ensure equal treatment of the consumers and the maximum revenue from the sales of the resource of the state as the owner of the resource.

The resource policy of the state shall be analysed in order to ensure fair compensation to the state for the resource, decrease of the impact on the environment and economic development. The abovementioned analysis is planned within the framework of measure 3.3. upon analysing the alternatives of the taxation of the energy sector and the planned deadline for the completion of the analysis is 2012.

## **Annexes**

### **Annex 1. Summary of SWOT analyses**

The existence of the stocks of domestic fuels (oil shale, peat and wood), the share of which has remained around 65% in the primary energy resources during the last decade, has provided security upon supplying with energy. One third of the primary energy resources was formed by imported fuels, from which natural gas imported from Russia and diesel fuel imported from Lithuania and Russia formed the biggest share. 90.2% of electricity was produced from oil shale, 5.6% from natural gas and other energy sources in 2006. Thus, upon the production of electricity Estonia is independent from the import of fuel; it is possible to cover the total electricity supply by the domestic fuels and energy sources, if necessary.

Estonia has a sufficiently developed natural gas infrastructure. Estonia has the total of three connections: from Narva and Värskla to Russia and from Karksi to Latvia with the total capacity 11,000 thousand m<sup>3</sup> in a twenty-four hour period. The gas transmission system has sufficient transmission capacity in Estonia and there will be no shortage of transmission capacity until 2015.

The Estonian energy market is small and the electricity and gas supply systems do not have interconnections with the other Member States of the European Union. Estonian gas market is in essence under the control of one undertaking - AS Eesti Gaas. In addition to the network operators belonging to the group of AS Eesti Gaas, there are 30 smaller network operators, who, however, buy gas from AS Eesti Gaas; electricity production is controlled by the biggest energy undertaking Eesti Energia AS, who owns 96% of the installed capacities and who produced 95.3% of the electricity in 2006.

The amount of energy consumed for the heating, ventilation, cooling, lighting of residential buildings and supply thereof with hot water is remarkable. Although reconstruction has become more active, undertakings invest more and more in new production equipment and new cars and buses are also procured, there is no statistical information or analysis which would confirm the improvement of energy efficiency as a result of the investments.

The transport infrastructure servicing the transit of liquid fuels has been rather well developed in Estonia. In intense competition the logistics and transportation companies have raised the service quality to the level competing with Finland. The Association of Port Operators encompasses the majority of Estonian transit companies.

The weakness of the transit sector is the one-sidedness of the goods in transit – crude oil and petroleum products dominate. Such a transit has a very high risk, since it depends to a great part on the economic policy decisions of the Russian authorities. Transportation of large amounts of crude oil poses a great danger also to the environment and the security of the residents.

The main function of the Estonian Oil Stockpiling Agency (OSPA) is to establish and manage the 90 days' liquid fuel stocks of the Republic of Estonia. The establishment of the security stockpile has not been completed yet, thus, causing potential vulnerability in the case of supply disruptions.

The strength of the Estonian energy sector lies in the functioning legal environment and market supervision. The Estonian Competition Authority operates as the energy market regulator, whose function is to exercise state supervision over compliance with the requirements arising from legislation regulating the areas of activity of the Authority and in case of violation of these requirements, to apply enforcement powers of the state.

## Annex 2. Objectives of the national development plans and strategies related to the energy sector

Development plan	Objective	Measure and activities	Indicator
Development Plan of the Estonian Electricity Sector until 2018	1. Continuous supply of electricity is ensured for consumers located in Estonia	<p>1.1. Construction of peak and emergency reserve capacities following a competition organised by the system operator</p> <p>1.2. Promotion of the construction of power production capacities in Estonia conforming to the trends of the Development Plan, granting of state aid for that purpose, if necessary</p> <p>1.3. Creation of preconditions for the construction of new international connections</p> <p>1.4. Analysis and development of the quality requirements for network services, improvement of the quality of network services</p> <p>1.5. Ensuring electricity supply for all interested persons</p>	<p>1. The ratio of the available net capacity of power plants to the maximum net consumption of electricity during a winter period (October-March) exceeds 110%, but does not exceed 140%.</p> <p>2. The annual average duration of the power cuts caused by the failures at the place of consumption indicates a decreasing trend.</p> <p>3. By 2018 the total capacity of the power connections between the Baltic States and the European Union will form at least 80% of the connection capacities between the Baltic States and third countries.</p>
	2. Power supply and consumption of the consumers located in Estonia has become more sustainable	<p>2.1. Supporting sustainable methods of electricity production</p> <p>2.2. Updating of legislation with an aim to enhance the efficiency of electricity undertakings</p> <p>2.3. Implementation of innovative power network solutions</p> <p>2.4. Raising of awareness of saving electricity</p>	<p>1. The share of renewable electricity in gross consumption is increasing and will reach at least 5.1% by 2010 and at least 15% by 2015.</p> <p>2. The share of cogeneration electricity will be least 20% of the gross consumption in 2020.</p> <p>3. The share of power transmission losses below 3%, the share of distribution losses below 7%, below 6% from 2015</p> <p>4. Electricity consumption per capita in households does not exceed the average level in the European Union.</p> <p>5. The amount of atmospheric emissions of CO<sub>2</sub> does not exceed 5 million tons in 2020.</p> <p>6. Decrease of the share of oil shale electricity in the gross production of electricity</p>

Development plan	Objective	Measure and activities	Indicator
	3. Power supply at a justified price has been ensured for consumers located in Estonia.	3.1. Opening of the electricity market, establishment of power exchange 3.2. Development of honest competition rules and ensuring that the competition rules are complied with 3.3 Taking external costs gradually into account in the price of electricity in the framework of the ecological tax reform 3.4. Analysis of the effectiveness of support schemes for renewable and cogeneration electricity, correction thereof, if necessary 3.5. Preparation and entry into force of legislation concerning nuclear power plants	1. 35% of the electricity market opened in 2009, fully opened in 2013 at the latest 2. The market share of one electricity seller in the common market area does not exceed 40% in 2018.
National Development Plan for the Use of Oil Shale for 2008–2015 (draft)	1. To ensure supply of Estonia with oil shale energy and to guarantee the energetic independence of Estonia	1.1. Defining the interest of the state and changing the terms and conditions for issuing extraction permits 1.2. Implementation of legal regulations for the reduction of the use of oil shale 1.3. Ensuring sustainability of the use of oil shale	
	2. To increase the efficiency of the use and extraction of oil shale	2.1. Optimisation of the extraction capacity 2.2. Promotion of applied research and product development in the field of oil shale 2.3. Reviewing the principles of the environmental charges of oil shale extraction and use 2.4. Promotion of education and research Activity: ordering of analysis required for strategic planning of the energy sector and the electricity sector (finding and using alternative energy sources for ensuring sufficient production capacity in order to reduce the share of oil shale).	The upper limit of oil shale excavation up to 15 million t/y – deadline 2015

<b>Development plan</b>	<b>Objective</b>	<b>Measure and activities</b>	<b>Indicator</b>
Development Plan for Enhancing the Use of Biomass and Bioenergy for 2007–2013	Primary objective: to create favourable conditions for the development of the production of domestic biomass and bioenergy in order to decrease the dependence of Estonia on imported resources and fossil fuels and to reduce pressure on the natural environment by using the earth resources effectively and sustainably and to promote employment in rural areas		1. The share of district heat produced from renewable sources in the total produced district heat is 33% (2013) 2. The share of biofuels in consumption is 6% (2013) 3. The share of electricity produced in biomass-based cogeneration regime in domestic electricity consumption is 3% (2013)
	Objective 3: to ensure implementation of the instruments required for market organisation	3.9. Imposition of obligations Activity: the impact of imposing the mandatory proportion of transport biofuels on the fuel market will be analysed	The measure will be implemented starting from 2008, if suitable.
Energy Conservation Target Programme for 2007- 2013	1. To make the information concerning the saving of fuels and energy more accessible for and usable by energy consumers, organisers of the energy sector and energy undertakings and to make the consumers prefer sustainable equipment	1.1. Counselling of local governments upon planning the development of the energy sector and the related sectors 1.2. Mapping of the need for counselling of undertakings in the field of energy conservation and counselling of the undertakings 1.3. Development of new methods for dissemination of information in the field of energy conservation 1.4. Popularisation of consumption solutions and equipment which promote energy conservation	The share of class A appliances realized on the market of electrical equipment and light bulbs (the estimated share in 2006 - 50%, target for 2013 – at least 75%)
	2.To ensure that lifelong education in the field of energy conservation is provided to specialists engaged in the issues concerning the operation of buildings and facilities and to increase the number of non-governmental organisations providing training in energy conservation	2.1.Providing in-service training courses in the field of energy conservation for specialists 2.2. Analysis of technical solutions contributing to rational use of fuels and energy 2.3. Development of the provision of energy services	The number of non-governmental organisations providing training in the field of energy conservation (the estimated number in 2006 - 3, target in 2013 – at least 6)

Development plan	Objective	Measure and activities	Indicator
	3. To improve possibilities for financing investments directed at saving fuels and energy and to support projects directed at saving fuels and energy	3.1. Imposing energy conservation obligation on energy undertakings 3.2. Stimulation of raising of initial capital required for investments and development of loan products directed thereat 3.3. Improvement of efficiency upon the production and transmission of energy 3.4. Supporting small-scale projects of local governments directed at energy conservation 3.5. Increasing the quality and energy conservation of the housing stock	Investments made in the projects directed at saving fuels and energy as a result of the measures applied by the state during the period 2007-2013 (total: 1.5 billion kroons)
	4. To ensure transposition of and assessment of the efficiency of the implementation of the EU Directives on saving fuels and energy	4.1. Transposition of the Directives 2002/91/EC, 2005/32/EC and 2006/32/EC 4.2. Supporting implementation of the Commission Action Plan for Energy Efficiency COM(2006)545 4.3. International cooperation upon improvement of the efficiency of energy use	Number of infringement proceedings concerning legislation on energy conservation initiated by the European Commission and in force with respect to Estonia (1 in 2007, target 0 in 2010)
Transport Development Plan for 2006–2013	5. To minimise the adverse effect of the transport sector on the environment and health	5.1. Application of the principle of internalisation of external costs 5.2. Stimulation of the use of environment-friendly technologies 5.3. Prevention and mitigation of the consequences of the adverse impact caused by transport	1. The share of internalised external costs 75% 2. The share of new passenger cars with CO <sub>2</sub> emission below 120 mg/km among the cars entered in the register in Estonia has increased to 30% 3. The share of heavy goods vehicles complying with Euro 3 standard among the total amount of heavy goods vehicles has increased to 50% by 2013 4. Decrease of the impact of environmental emergencies by 20% by 2013 5. Decrease of the number of people living in areas with the daily noise level exceeding 55 dB by 20% by 2013 as a result of noise mitigation measures 6. 20% increase of satisfaction with the prevention and elimination of adverse effects on the environment

Development plan	Objective	Measure and activities	Indicator
Estonian Environmental Strategy until 2030	5.3.1. To produce electricity in an amount, which satisfies the consumption needs in Estonia, and to develop versatile, sustainable production technologies based on different energy sources and with little environmental load, which enable to produce electricity also for export	<p>1.1. Assessment of the availability of existing energy resources and preparation of long-term plans for their utilisation</p> <p>1.2. Drafting and supplementation of legislation concerning ambient air protection and development of an ambient air monitoring system</p> <p>1.3. Supporting of research and development activities and pilot projects related to new energy production methods</p> <p>1.4. Modernisation of existing production basis to bring it into conformity to environmental requirements</p> <p>1.5. Introduction of renewable and other alternative energy sources</p>	<p>1. The amount of greenhouse gases emitted in the course of energy production (absolute value) ↔ – the absolute value of greenhouse gas emissions remains on the level of the year 2005.</p> <p>2. Emissions of air pollutants (SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub>, VOC, heavy metals) in the course of energy production – the amounts of emissions are reduced at least to a level that conforms to EU requirements (tons per year) ↓</p> <p>3. The relative share of various fuel types in energy production (%):</p> <ul style="list-style-type: none"> <li>– by 2015 the relative share of oil shale in the production of electricity amounts to less than 90%;</li> <li>- by 2015 the relative share of electricity produced on the basis of renewable energy sources and consumed in Estonia will increase to at least 8%;</li> <li>- by 2020 the relative share of electricity produced in combined heat and power plants and consumed in Estonia will increase to at least 20%.</li> </ul>

Development plan	Objective	Measure and activities	Indicator
	5.3.2 To slow down and stabilise the consumption of energy, while ensuring that the needs of people are met, i.e. to ensure the preservation of the volume of primary energy while consumption grows	<p>2.1. Drawing up and implementation of regulations and support schemes to enhance energy conservation and manage the consumption of energy, incl. development in compliance with the legislation of the European Union</p> <p>2.2. Supporting research and development activities and pilot projects related to the optimisation of energy systems</p> <p>2.3. Upgrading of energy systems to reduce power and heat losses</p> <p>2.4. Increasing the awareness of energy conservation</p> <p>2.5. Integration of energy conservation in other sectors, including analysis of the impact of current legislation underlying the grant of state benefits</p>	<p>1. Intensity of energy consumption (thousand toe/EEK million)↓, base level 0.03 thousand toe/EEK million</p> <p>2. Fuel prices (EEK/ton or EEK/m<sup>3</sup>) ↔</p> <p>3. Prices of electricity (EEK/MWh) ↔, base level EEK 765/MWh</p> <p>4. Fuel and energy losses (TJ) ↓</p> <p>5. Energy consumption per unit of GDP (considering the purchasing power parity) – primary energy consumption volume will remain at the level of the year 2003 until 2010. Base level in 2003: 20.0 TJ per PPP.</p>
Estonian Housing Development Plan for 2008–2013	2. To develop high quality and sustainable housing stock	2.1. Increasing the quality and energy efficiency of the housing stock	Result by 2013: the share of apartment buildings falling into the highest energy efficiency category is 10 %
Estonian Action Plan for Economic Growth and Employment for 2008- 2011	Sub-objective 3: to increase energy efficiency	<p>3.1. Improving availability of information in the field of energy saving and ensuring energy saving skills and expertise (2008–2013)</p> <p>3.2. Supporting evaluation of construction works and energy auditing and renovation and reconstruction directed at energy saving of apartment buildings built before 1990</p> <p>3.3. Drawing up legislation for the application of the energy conservation requirements for energy undertakings (2008–2009)</p> <p>3.4. Supporting investments in the renovation of heating pipelines of district heating networks (2008–2013)</p> <p>3.5. Drawing up guidelines for environment-friendly public procurements (2008–2011)</p>	<p>1. Electricity losses from the network and from company equipment. Electricity losses as a ratio to gross production (i.e. including auxiliary energy of the power plant) – the estimated level 9% by 2011 (2006: 11.07%)</p> <p>2. Energy intensity of the economy The ratio of primary energy supply to GDP – 0.842 toe/MEUR i.e. -13% compared to 2006 (2006: 0.967 toe/MEUR)</p> <p>3. Energy saved by implementing energy conservation measures in Estonia Energy saved by energy conservation measures implemented by the initiative of the public and private sector in TJ – energy savings by implementing planned energy conservation</p>

Development plan	Objective	Measure and activities	Indicator
			measures: 1000 TJ (2007: savings: 5TJ)

**Annex 3. Relations between future and prepared development plans directing the energy sector**

