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1 SUMMARY OF NATIONAL RENEWABLE ENERGY POLICY

Compared with 1990, Estonia has reduced its greenhouse gas emissions by more than 50%, and the share of renewable energy sources in total energy consumption in 2005 was 18%. In accordance with Directive 2009/28/EC on the promotion of the use of energy from renewable sources, Estonia is obliged to increase the share of renewable energy sources in the whole of energy consumption as compared to the reference year of 2005 to 25% by 2020. At the moment, the use of biofuels in Estonia is still low, but interest in the use of biofuels is constantly increasing. As a result of the period of economic growth lasting until 2007, energy consumption figures in Estonia have also somewhat increased, but at a significantly slower pace than that of economic growth.

Thanks to investments in energy efficiency in the Estonian energy system as a whole, the demand for heating and losses of heat and electricity have decreased significantly. The energy intensity of the Estonian economy over the last five years has reduced to a considerable extent. To attain the objectives of improving energy efficiency, the Energy Conservation Target Programme for the Period 2007 to 2013 has been drawn up.

The Estlink underwater cable, which was made operational in 2007, connected the electricity markets of the Baltic countries with the energy markets of the Nordic countries. Several new renewable energy plants and combined heat and power plants are being established, which significantly increase the efficiency of the Estonian energy system.

Several strategy documents on the use of renewable energy sources have been drawn up and adopted in Estonia. The main “roof strategy” of the energy sector is the National Development Plan of the Energy Sector up to 2020. In addition to the development plans listed below, the Estonian National Renewable Energy Action Plan up to 2020 also forms a part of it.

a. The Development Plan of the Estonian Electricity Sector for the Period 2008 to 2018 sets the strategic objectives for the development of the electricity sector within the coming ten years by describing the objectives and the measures for achieving the plan 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.

b. The National Development Plan for the Use of Oil Shale for the Period 2008 to 2015: the strategic objective of the plan is to ensure that Estonia is supplied with oil shale energy and to guarantee the energy independence of Estonia. In addition, the development plan raises the issue of finding longer term ways to gradually reduce the annual use of oil shale to a 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 of ensuring sustainable energy supply and consumption in Estonia. The National Development Plan for the Use of Oil Shale for the Period 2008 to 2015 was approved by a decision of the Riigikogu of 21 October 2008.

c. The Development Plan for Enhancing the Use of Biomass and Bioenergy for the Period 2007 to 2013: the objective of the plan is to create beneficial conditions for the development of domestic biomass and bioenergy production in order to reduce the dependence of Estonia on imported resources and fossil fuels and to decrease the 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 of ensuring continuous energy supply by diversification of energy sources and more even distribution in the energy balance.

d. The Energy Conservation Target Programme for the Period 2007 to 2013 defines the targets for saving fuel and energy in Estonia for the period 2007 to 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 in achieving the objectives of the Development Plan of the Energy Sector in the areas of energy conservation and energy efficiency.

2 EXPECTED FINAL ENERGY CONSUMPTION 2010–2020

2.1 Forecast final energy consumption in Estonia

An overview of the forecast final energy consumption in Estonia has been provided in Table 1. The reference scenario takes into account changes in final energy consumption, taking into consideration expected changes in the economy in the period 2010 to 2020. In the case of the forecast consumption only those energy efficiency and saving measures adopted before 2009 have been taken into account. In providing a brief description of the reference scenario the following figures about energy consumption in 2020 can be offered:

- final energy consumption will increase by 13.4% compared to the average final energy consumption from 2005 to 2008;
- electricity consumption will increase by 30% compared to the average of 2005 to 2008 (not including the energy sector);
- heat consumption will decrease by 8% compared to the average of 2005 to 2008 (not including the energy sector);
- the consumption of fuels will increase by 18% compared to the average of 2005 to 2008, the consumption of motor fuels will increase by 18% (not including the energy sector);
- in the industrial sector and agriculture, energy consumption will increase by 27%; in transport it will increase by 15%; and in the business and public service sectors and households it will increase by 6% compared to the average from 2005 to 2008;
- energy consumption in the energy sector will decrease by 3%.

Table 1 also describes the expected energy consumption in the case of the additional energy efficiency scenario. Expected changes as of 2020 may be summarised as follows:

- final energy consumption will increase by 8.4% compared to the average final energy consumption from 2005 to 2008;
- by 2020 electricity consumption will increase by 28% compared to the average of 2005 to 2008 (not including the energy sector);
- by 2020 heat consumption will decrease by 15% compared to the average of 2005 to 2008 (not including the energy sector);

- by 2020 the consumption of fuels will increase by 12.4% compared to the average of 2005 to 2008 (not including the energy sector), the consumption of motor fuels will increase by 16%;
- in the industrial sector energy consumption will increase by 24%, in agriculture by 17%, in the transport sector by 13%, and in the business and public service sectors by 2.5% compared to the average from 2005 to 2008;
- in households energy consumption will decrease by 1.7% compared to the average of 2005 to 2008;
- energy consumption in the energy sector will decrease by 3%.

In the case of the scenarios indicated in Table 1 the possibility of one or more large industrial undertakings or another large energy consumer becoming a new energy consumer in Estonia has not been taken into account. Due to the relatively small energy consumption in Estonia, the addition of a new large consumer may increase energy consumption to an extent that has not been foreseen in the forecasts described in Table 1. It must also be stated that the significant changes in the economy that have taken place in recent years aggravate the preparation of reliable long-term forecasts in respect of the development of the energy sector.

2.2 How to calculate the “aviation capping mechanism”

From 2005 to 2020 the share of aviation energy consumption (AEC) in Estonia has not and will not exceed 6.18% of its total gross final energy consumption (GFEC) in the case of the additional energy efficiency scenario.

Table 1. Expected gross final energy consumption of Estonia in heating and cooling, electricity and transport up to 2020 taking into account the effects of energy efficiency and energy saving measures¹ 2010–2020 (ktoe)

	2005		2010		2011		2012		2013		2014	
	base year		reference scenario	additional energy efficiency								
1. heating and cooling ²		1 615	1 592	1 572	1 601	1 573	1 610	1 574	1 619	1 575	1 628	1 576
2. electricity ³		738	829	829	842	840	856	851	869	862	883	873
3. transport as in Article 3(4)a ⁴		746	789	789	809	805	828	821	847	837	867	852
4. Gross final energy consumption ⁵		3 098	3 210	3 190	3 252	3 218	3 294	3 246	3 336	3 273	3 377	3 301
<i>TOTAL CONSUMPTION after reduction for aviation limit</i>		3 098	3 210	3 190	3 252	3 218	3 294	3 246	3 336	3 273	3 377	3 301

	2015		2016		2017		2018		2019		2020	
	reference scenario	additional energy efficiency										
1. heating and cooling ⁶	1 637	1 577	1 649	1 577	1 661	1 578	1 673	1 578	1 686	1 579	1 698	1 579

¹ These estimates on energy efficiency and energy savings shall be consistent with other such estimates that Member States notify to the Commission, notably in Action Plans under the Energy Services Directive and the Energy Performance of Buildings Directive. If different units are used in those Action Plans the conversion factors applied should be indicated.

² It is the final energy consumption of all energy commodities except electricity for purposes other than transport, plus the consumption of heat for own use at electricity and heat plants and heat losses in networks (items '2. Own use by plant' and '11. Transmission and distribution losses' of Regulation on Energy Statistics, OJ No L 304, 14.11.2008, p. 23–24.

³ The gross electricity consumption is national gross electricity production, including autoproduction, plus imports, minus exports.

⁴ Transport consumption as defined in Article 3(4)(a) of Directive 2009/28/EC. Renewable electricity in road transport for this figure should be multiplied by a factor of 2.5, as indicated by Article 3(4)(c) of Directive 2009/28/EC.

⁵ As defined in Article (2)(f) of Directive 2009/28/EC. This comprises final energy consumption plus network losses and own use of heat and electricity at electricity and heating plants (NB: this does not include consumption of electricity for pumped hydro storage or for transformation in electrical boilers or heat pumps at district heating plants).

⁶ See footnote 4.

2. electricity ⁷	896	884	892	880	907	894	921	909	936	923	951	938
3. transport as in Article 3(4)a ⁸	886	868	900	881	913	895	927	908	940	921	954	934
4. Gross final energy consumption ⁹	3 419	3 329	3 440	3 338	3 481	3 366	3 522	3 395	3 562	3 423	3 602	3 451
<i>TOTAL CONSUMPTION after reduction for aviation limit</i>	3 419	3 329	3 440	3 338	3 481	3 366	3 522	3 395	3 562	3 423	3 602	3 451

⁷ See footnote 5.

⁸ See footnote 6.

⁹ See footnote 7.

3 RENEWABLE ENERGY TARGETS AND TRAJECTORIES

From the point of view of the economic and social welfare of the European Union energy supply is very important. The resources of energetic raw material in Europe are scarce and with regard to petroleum and gas the EU's dependence on imports is growing fast. According to the forecasts the EU's dependence on imported energy will grow from approximately 50 percent to 65 percent by 2030 and there may also be unstable regions among the countries of origin. The need for a more rational use of energy is also due to the environmental impacts associated with the use of energy from fossil sources and the impact of energy expenditure on economic manageability.

To settle the challenges, the European Commission has presented the European energy policy document COM(2007) 1, the aim of which is firstly to combat climate change and secondly to improve the EU's security and competitiveness of energy supply. The plan was endorsed by the European Council in 2007 when more specific long-term objectives of energy policy in the European Union were approved:

- Increasing the share of renewable energy to 20% by 2020;
- Increasing the share of biofuels in transport to 10% by 2020;
- Energy saving of 20% by 2020;
- Reducing greenhouse gas emissions by at least 20%.

The Renewable Energy Directive 2009/28/EC approved specific renewable energy objectives for the EU Member States.

3.1 National overall target

Table 2. National overall target for the share of energy from renewable sources in gross final consumption of energy in 2005 and 2020 (figures to be transcribed from Annex I, Part A to Directive 2009/28/EC)

A. Share of energy from renewable sources in gross final consumption of energy in 2005 (S_{2005}) (%)	18
B. Target of energy from renewable sources in gross final consumption of energy in 2020 (S_{2020}) (%)	25
C. Expected total adjusted energy consumption in 2020 (from Table 1, last cell) (ktoe)	3 451
D. Expected amount of energy from renewable sources corresponding to the 2020 target (calculated as B x C) (ktoe)	863

3.2 Sectoral targets and trajectories

Table 3. National 2020 target and estimated trajectory of energy from renewable sources in heating and cooling, electricity and transport

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RES-H&C ¹⁰ (%)	16.3%	19.2%	19.3%	19.3%	19.1%	19.0%	18.8%	18.6%	18.4%	18.1%	17.9%	17.6%
RES-E ¹¹ (%)	0.3%	1.7%	1.8%	2.1%	2.9%	3.2%	3.5%	3.5%	4.0%	4.3%	4.2%	4.8%
RES-T ¹² (%)	0.0%	0.0%	0.0%	0.6%	1.2%	1.3%	1.3%	1.6%	1.8%	2.1%	2.4%	2.7%
Overall RES share ¹³ (%)	16.6%	20.9%	21.2%	22.0%	23.3%	23.4%	23.6%	23.7%	24.2%	24.5%	24.5%	25.0%
<i>Of which from cooperation mechanism¹⁴</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Surplus for cooperation mechanism¹⁵ (%)</i>	-	-	1.8%	2.6%	3.2%	3.3%	2.4%	2.5%	1.7%	2.0%	0.7%	0.0%
As Part B of Annex I to the Directive			2011–2012		2013–2014		2015–2016		2017–2018			2020
			S ₂₀₀₅ + 20% (S ₂₀₂₀ -S ₂₀₀₅)		S ₂₀₀₅ + 30% (S ₂₀₂₀ -S ₂₀₀₅)		S ₂₀₀₅ + 45% (S ₂₀₂₀ -S ₂₀₀₅)		S ₂₀₀₅ + 65% (S ₂₀₂₀ -S ₂₀₀₅)			S ₂₀₂₀
RES minimum trajectory ¹⁶ (%)			19.40		20.10		21.15		22.55			25
RES minimum trajectory (ktoe)			630		658		706		759			863

¹⁰ Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Articles 5(1)(b) and 5(4) of Directive 2009/28/EC) divided by gross final consumption of energy for heating and cooling. Line (A) from Table 4a divided by line (1) of Table 1.

¹¹ Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Articles 5(1)(a) and 5(3) of Directive 2009/28/EC) divided by total gross final consumption of electricity. Row (B) from Table 4a divided by row (2) of Table 1.

¹² Share of renewable energy in transport: final energy from renewable sources consumed in transport (cf. Article 5(1)(c) and 5(5) of Directive 2009/28/EC) divided by the consumption in transport of 1) petrol; 2) diesel; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1). Line (J) from Table 4b divided by row (3) of Table 1.

¹³ Share of renewable energy in gross final energy consumption. Row (G) from Table 4a divided by row (4) of Table 1.

¹⁴ Percentage of overall RES share.

¹⁵ Percentage of overall RES share.

¹⁶ As defined in Annex I.B to the Directive 2009/28/EC.



Table 4a. Calculation table for the renewable energy contribution of each sector to final energy consumption

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
(A) Expected gross final consumption of RES for heating and cooling	505	612	622	626	626	626	626	623	619	615	611	607
(B) Expected gross final consumption of electricity from RES	9	53	59	69	97	105	117	116	136	146	145	165
(C) Expected final consumption of energy from RES in transport	0	1	1	20	40	41	42	52	61	71	81	92
(D) Expected total RES consumption ¹⁷	515	666	682	714	763	773	786	790	816	832	837	863
(E) Expected transfer of RES to other Member States	-	-	58	85	105	109	81	84	57	66	23	0
(F) Expected transfer of RES from other Member States and 3 rd countries	0	0	0	0	0	0	0	0	0	0	0	0
(G) Expected RES consumption adjusted for target (D) - (E) + (F)	-	666	624	630	658	664	704	706	759	766	814	863

¹⁷ Pursuant to Article 5(1) of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

Table 4b. Calculation table for the renewable energy in transport share (ktoe)

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
(C) Expected RES consumption in transport ¹⁸	0	1	1	20	40	41	42	52	61	71	81	92
(C) Expected RES electricity in road transport* ¹⁹												
(I) Expected consumption of biofuels from wastes, residues, non-food cellulosic and lignocellulosic material in transport ²⁰												
(J) Expected RES contribution to transport for the RES-T target: (C) + (2.5 - 1) x (H) + (2 - 1) x (I)												

¹⁸ Containing all RES used in transport including electricity, hydrogen and gas from renewable energy sources, and excluding biofuels that do not comply with the sustainability criteria (cf. Article 5(1) last subparagraph). Specify here actual values without using the multiplication factors.

¹⁹ Specify here actual values without using the multiplication factors.

²⁰ Specify here actual values without using the multiplication factors.

4 MEASURES FOR ACHIEVING THE TARGETS

4.1 Overview of all enforced policies and measures to promote the use of energy from renewable resources

This Part provides an overview of measures enforced in Estonia to encourage the mobilisation of renewable energy.

Table 5. Overview of all renewable energy policies and measures

<i>Name and reference of the measure</i>	<i>Type of measure*</i>	<i>Expected result**</i>	<i>Target group and/or activity***</i>	<i>Existing or planned</i>	<i>Start and end dates of the measure</i>
1. <i>Feed-in tariff</i>	Regulatory	Increased energy generated from renewable sources	producer of electricity	existing	A supplement to the Electricity Market Act 1 July 2010
2. <i>Certificate of origin</i>	Regulatory	Increased energy generated from renewable sources	producer of electricity	existing	The Electricity Market Act
3. <i>Exemption of biofuels from fuel excise duty</i>	Regulatory	Increased consumption of bioliquids	consumer	existing	The Alcohol, Tobacco and Fuel and Electricity Excise Duty Act until 27 July 2011
4. <i>Support for investment Broader use of renewable energy sources for power production</i>	Financial	Increased energy generated from renewable sources	District heating plant	existing	As of 24 March 2009
5. <i>Support for investment in bioenergy production</i>	Financial	Increased energy generated from renewable sources	farmer	existing	Until 2013
6. <i>Diversification towards non-agricultural activity</i>	Financial	Increased biofuel production	farmer	existing	Until 2013
7. <i>Support for investment in adding value to forestry products</i>	Financial	Increased biofuel production	Biofuel producer	existing	Until 2013
8. <i>National Energy Technology Programme – ETP</i>	Financial	Development of technology	R&D	existing	2007–2013
9. <i>Development Plan for Enhancing the Use of Biomass and Bioenergy for the Period 2007 to 2013 – R&D</i>	Financial	Development of technology / surveys	R&D	existing	2009–2014

The existing measures can be classified into the following groups:

- 1) support in the energy sector (measures with reference number 1–4)²¹;
- 2) support in the agriculture and forestry sectors (measures with reference number 5–7);
- 3) measures to encourage R&D (measures with reference number 8–9).

²¹ <https://www.riigiteataja.ee/ert/act.jsp?id=13218417>.

SUPPORT IN ENERGY SECTOR

Support for the mobilisation of renewable energy sources to operators of the energy sector is distributed in the electricity sector to producers of electricity pursuant to the Electricity Market Act, to manufacturers of liquid fuel pursuant to the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act and in the district heating sector from the EU Structural Funds and other sources through the Environmental Investment Centre.

1. Purchase obligation for renewable electricity at a fixed price

The support for generating electricity from renewable energy sources pursuant to the Electricity Market Act is paid out by the transmission network operator (OÜ ELERING). Any expenditure arising from financing the support shall be borne by the consumer according to the volume of consumption of network service and the quantity of electricity consumed through a direct line.

The Electricity Market Act defines renewable energy sources as water, wind, solar, wave, tidal and geothermal energy sources, landfill gas, sewage treatment plant gas, biogases and biomass and biomass is 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.

A producer has the right to receive a support from the transmission network operator:

- 1) for electricity if the producer has generated it from a renewable energy source, except from biomass;
- 2) for electricity if the producer has generated it from biomass in a cogeneration scheme. If electricity is generated from biomass in condensing regime, it is not subject to the support;
- 3) for electricity if the producer has generated it in efficient cogeneration scheme from waste as defined in the Waste Act, from peat or from the pyrolysis gas of oil shale processing;
- 4) for electricity if the producer has generated it in an efficient cogeneration scheme with a generating installation with a capacity not exceeding 10 MW.

The transmission network operator shall pay the producer support on the basis of the producer's application as follows:

- 1) EEK 0.84/kWh if the electricity is generated from a renewable energy source or biomass in a cogeneration scheme. If electricity is generated from biomass in a condensing regime, it is not subject to the support;
- 2) EEK 0.50/kWh if the electricity is generated in an efficient cogeneration scheme from waste or in an efficient cogeneration scheme with a generating installation with a capacity not exceeding 10 MW;
- 3) at the aforementioned rate for one kW/h of electricity or at the rate approved by the Estonian Competition Authority if the electricity is generated in efficient cogeneration scheme from a renewable energy source or from peat.

Based on an application presented by the producer the Competition Authority may approve a rate different from the support rate if the electricity has been generated in efficient cogeneration scheme from a renewable energy source or from peat.

When approving the support rate, it shall be taken into consideration that the support along with the market price of the electricity must allow the producer:

- 1) to cover the justified expenditure incurred to generate electricity, provided that expenditure on fuel does not exceed the market price;
- 2) to cover any expenditure incurred to perform obligations arising from legislation and conditions of the activity licence;
- 3) to cover justified capital expenditure;
- 4) to ensure justified cost benefit on invested capital.

In accordance with Section 59¹ of the Electricity Market Act, a producer who uses wind as the source of energy may receive support until support has been paid for a total amount of 600 GWh electricity generated from wind power in Estonia. Separate accounting is kept for each calendar year.

2. Guarantee of origin:

In accordance with the Electricity Market Act at the request of a producer, a transmission network operator shall issue to the producer a guarantee of origin certifying that the producer generated electricity from renewable energy sources or in efficient cogeneration scheme. The transmission network operator shall create a database for the administration of guarantees of origin and shall publish information regarding the issued guarantees of origin on its website.

3. Exemption of biofuels from fuel excise duty

The basis for exemption of biofuels from excise duty is the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act (hereinafter the ATFEEDA) in accordance with Section 27(1)(28) of which biofuel shall be exempt from excise duty after issue of a permit by the European Commission until the expiry of the permit, i.e. 27 July 2011.

In accordance with a decision the following biofuels specified in Section 19(14) of the ATFEEDA shall be exempt from excise duty:

- 1) for which the first four digits of the CN (combined nomenclature) code are 1507–1518;
- 2) which is produced from biomass, including fuel for which the eight digits of the CN code are 3824 90 55 or 3824 90 80–3824 90 99. The biodegradable fraction of products from agriculture, including vegetal and animal substances, products, waste and residues from forestry and the biodegradable fraction of industrial and municipal waste is deemed to be biomass;
- 3) for which the eight digits of the CN code are 2207 20 00 or 2905 11 00 and which are not of synthetic origin;
- 4) which is produced from biomass, including fuel for which the first four digits of the CN code are 4401 or 4402.

The CN number arises from the combined nomenclature established in Council Regulation (EEC) No 2658/87.

If biofuel has been blended with fossil fuel, for example bioethanol with usual petrol, exemption from excise duty shall apply only to the quantity of biofuel in the blend (Section 66(19) of the ATFEEDA).

Section 21 of the ATFEEDA covers the production of excise goods:

Section 21(4) of the ATFEEDA sets out that excise goods may be produced in excise warehouses. Alcohol may be denatured in excise warehouses or customs warehouses. Fuel may be processed under the customs procedure for processing under customs control or the customs procedure for inward processing or the customs procedure for customs warehousing. Solid fuel, liquid combustible substances and biofuel specified in Section 19(14)(2) and (4) of this Act, except biofuel for which the eight digits of the CN code are 3824 90 99 may be produced outside of an excise warehouse. Biofuel specified in Section 19(14)(1) of this Act and biofuel for which the eight digits of the CN code are 3824 90 99 shall be produced in an excise warehouse if such biofuel is produced for use as motor fuel or heating fuel. Fuel in temporary storage may also be marked with a fiscal marker in a customs terminal.

The right to produce biofuel exempt from excise duty, transport it to Estonia and release it for consumption is granted by a biofuel permit (Section 69¹ of the ATFEEDA). A person who wishes to obtain a biofuel permit shall submit a written application to the Tax and Customs Board, which shall set out the name, address of the residence or place of business and the contact details of the applicant, the name and CN code of the biofuel to be handled, the planned quantity of biofuel to be produced in a year, the quantity of biofuel to be imported into Estonia and the quantity of biofuel to be released for consumption. In the case of biofuel production, the technological description of the production process shall also be submitted. The term for processing a permit is generally 30 days.

The holder of a biofuel permit is required to submit, by 1 March each year, a biofuel report to the Tax and Customs Board. A biofuel report shall set out the information for the calendar year preceding the year of submission of the report (Section 69¹(4) of the ATFEEDA). A biofuel report shall contain the following information:

- 1) the name, CN code and quantity of biofuel released for consumption;
- 2) the value of the biofuel released for consumption and a calculation of the formation thereof, including the value of the raw material of and additives to the biofuel, and a calculation of production costs;
- 3) the energy value of the biofuel released for consumption.

If the holder of a biofuel permit fails to submit the biofuel report during the term or fails to submit the information as requested by the Tax and Customs Board, the Director General of the Tax and Customs Board may suspend the biofuel permit (Section 69¹(6) of the ATFEEDA).

The Director General of the Tax and Customs Board shall revoke a biofuel permit if the circumstances for suspension of the permit have not ceased to exist within thirty days after the date of suspension of the permit, or if the holder of a biofuel permit submits an application for revocation of the permit to the Tax and Customs Board (Section 69¹(7) of the ATFEEDA).

If the help of a third person is used in producing biofuel, transporting it to Estonia and releasing it for consumption, the person who is required to hold a permit is not the owner of

biofuel but the person who receives, stores, processes and issues fuel, i.e. provides the excise warehouse service, in reality.

It may also be necessary for an undertaking engaged in biofuels to hold an excise warehouse activity licence or to use the service of an excise warehouse keeper in addition to holding a biofuel permit.

There are no plans to continue the exemption of biofuels from fuel excise duty after the expiry of a valid state aid permit (in July 2011).

4. Broader use of renewable energy sources for power production

Under this support measure projects are financed out of the European Regional Development Fund (the ERDF) (under the priority axis “Development of energy sector” of the Operational Programme for the Development of the Living Environment from 2007 to 2013) and the conditions for the measure have been determined by a Regulation of the Minister of the Environment²². Applications are received and processed by the Environmental Investment Centre (EIC).

The measure supports the establishment of combined heat and power plants using renewable energy sources, transfer of boiler plants to renewable energy sources and improvement and reconstruction of heating networks for the purpose of energy saving. The objective of granting support is the growth of the share of renewable energy sources in the energy balance and reduction of emissions of pollutants originating from energy generation system.

The following actions are supported under the measure:

- 1) establishment of combined heat and power plants using renewable energy sources along with the infrastructure required for the network connection of generating installations;
- 2) transfer to renewable energy through reconstruction of boiler plants for the use of renewable energy sources;
- 3) energy saving through the improvement and reconstruction of district heating network, including establishment of required additional connections.

The following actions are not supported under the measure:

- 1) establishment or reconstruction of combined heat and power plants of installed gross electrical capacity of more than 2 MW outside the islands of Estonia;
- 2) establishment or reconstruction of district heating boiler plants of installed gross capacity of more than 4 MW;
- 3) major investments (projects with a total budget of more than EUR 50 million).

The granting of support is round-based.

The minimum level of support for a project is EEK 500,000 (five hundred thousand) and the maximum amount is EEK 50 million. The maximum rate of support is 50% of eligible expenditure of a project, the minimum rate of self-financing is 50% of eligible expenditure of

²² Regulation No 14 of the Minister of the Environment of 24 March 2009 Conditions for the Measure “Broader Use of Renewable Energy Sources for Power Production”, published at <https://www.riigiteataja.ee/ert/act.jsp?id=13164085>.

a project, except the support applied for by a large-scale undertaking to a project located in Tallinn and Harju County where the maximum rate of support is 40% of the eligible expenditure of a project and the minimum rate of self-financing is 60% of the eligible expenditure of a project. The limit of 40% support is also applicable to an undertaking where more than 25% of the ownership is held by (a) large-scale undertaking(s).

An applicant may be the following legal entities who provide district heating service in a district heating region related to the project or who sell heat energy to a district heating region related to the project:

- 1) local authorities;
- 2) non-profit associations;
- 3) companies, except farmers;
- 4) foundations.

SUPPORT IN AGRICULTURE AND FORESTRY SECTORS

Support aimed at farmers is implemented through the Agricultural Registers and Information Board (ARIB). In addition to the traditional agricultural support the ARIB also intermediates support for producing bioenergy on the basis of the Rural Development Plan 2007–2013 that is financed 75% from the European Agricultural Fund for Rural Development (EAFRD) and 25% by the Estonian state.

5. Support for investment in the production of bioenergy

The ARIB receives and processes applications for measure 1.4.3 (Support for investment in the production of bioenergy) of the Rural Development Plan (hereinafter the RDP). The objective of the support is, based on Estonian Rural Development Plan 2007–2013, to support the diversification of production and improve the competitiveness of farmers from the European Agricultural Fund for Rural Development (EAFRD).

The investment support payable under measure 1.4.3 of the Rural Development Plan 2007–2013 supports the diversification of production and helps improve the competitiveness of farmers.

One of the conditions of the measure is that at least 50% of the produced energy must be used in the farmer's own undertaking. Support is paid totalling 40% and 60% of the cost of expenditure eligible for investment, maximum EEK 4.69 million per application in the programming period. Thereby the usual rate is 40%, but the share of support is 10% higher for producers of bioenergy in less-favoured areas. Another 10% is added if the applicant is a young farmer under 40 years of age.

The support can be used for constructing a building for processing biomass and producing bioenergy, constructing communications networks and roads belonging thereto, purchasing and installing electrical plants, obtaining and installing equipment required for the production of bioenergy, etc.

Before submitting an application the applicant must have operated as a farmer for at least 12 months and the sales revenue of agricultural products produced by the farmer or processed from the farmer's own production must be at least 50% of the sales or total revenue (in the year preceding the application). There are also certain requirements applicable to the farmer's economic indicators, profitability, etc. The educational requirement applies to all applicants; in the case of applicants who are sole proprietors, agricultural education or a work experience of at least two years is required; a private or public limited company must employ an employee of adequate education or work experience (this may also be a member of the management board). The support for producing bioenergy is available for large and small undertakings alike.

6. Diversification towards non-agricultural activity

Investments supported are those aimed at producing bioenergy where the produced energy is marketed. The recipients are microfarmers. Applications are received and processed by the ARIB.

The objective of the measure is to contribute to the development of non-agricultural micro-entrepreneurship in rural areas and to the diversification of farmers' production with other rural entrepreneurship (including rural tourism) outside traditional agriculture. The measure also includes production of biofuels, bio-electricity and bio-heat from biomass with the objective of marketing and promoting entrepreneurship in services related to improving quality of life.

An applicant must comply with the conditions for a micro-undertaking or a micro-undertaking engaged in agriculture, the producer of bioenergy may also be a medium-scale farmer. Their investment object must be located in a rural municipality or a small town of fewer than 4 000 residents.

The maximum amount of support per applicant in the case of minor projects is EEK 1 564 660 in the programming period 2007–2013, generally up to 50%.

7. Support for investment in adding value to forestry products

Support for investment in adding value to forestry products was granted under the conditions of measure 1.5.2 of the Rural Development Plan. The support is meant for micro-undertakings (with fewer than 10 employees) engaged in forestry. The support is granted to purchase machinery or equipment, for automatic or IT-equipment, as well as for expenditure related to inventions, utility models and patents. The expenditure must have been incurred in connection with processing raw wood, i.e. activities from cutting to drying wood, or purchasing equipment required for the production of bioenergy (wood chippers, log splitters, etc.).

The support can be received in the amount of up to 50% of the cost of eligible expenditure and the maximum amount of support per applicant in the programming period is EEK 3 129 320. To obtain felling equipment, one applicant may receive up to EEK 500 000 per calendar year. The applicant must be an undertaking processing forest. In the economic year preceding application, more than one-half of the sales revenue of the undertaking must have come from forest processing or management. The sales revenue must exceed EEK 37 552. At the same time the sales revenue of an applicant combined with their operating revenue may not exceed EEK 31.3 million.

Along with the receipt of investment support the Private Forest Centre Foundation as the delegated authority of the ARIB also organises the receipt of documents for two forest-related supports from private forest owners and forest associations. One support has been implemented to improve the economic value of forest (measure 1.5.1) and the other to restore damaged forest and prevent forest fires (measure 1.5.3).

Documentation on the two supports are received and processed by the Private Forest Centre Foundation and the conditions for and forms of application are available on the website of the Centre at www.eramets.ee/el_toetused.

In addition to the aforementioned measures, the Rural Development Foundation also issues farmers with loans and securities.

MEASURES TO ENCOURAGE R&D

National R&D programmes do not have separate support measures, but the programmes contain existing horizontal as well as vertical measures under the Operational Programme for the Development of Economic Environment from 2007 to 2013. The use of support measures of activities administered by the Ministry of Economic Affairs and Communications is coordinated by the Enterprise Estonia (EE), the activities administered by the Ministry of Education and Research are coordinated by the Archimedes Foundation and the activities administered by the Ministry of Agriculture are coordinated by the Rural Development Foundation (RDF). The support measures cover launching an undertaking, its growth, innovation, technology investments, export, development of knowledge and skills, recruitment of a development employee, etc.

In addition to technology development projects (in the field of applied research as well as product development) the financing also includes the programme supporting R&D projects. The priority one fields to be developed are the National Biotechnology Programme and the National Energy Technology Programme²³ (ETP).

8. National Energy Technology Programme – ETP

In 2007 the Research and Development Council authorised the principles of the energy technology programme and approved in principal the five-year energy technology programme aimed at establishing common coordination in supporting R&D in the field of energy.

Important objectives of the programme are to define important subfields for Estonia to be supported and to consolidate all the relevant parties responsible for different fields of energy.

The Energy Technology Programme develops three major subfields. Firstly, the production and processing of oil shale is developed; secondly, the use of renewable energy sources is developed; and the third subfield is new, rapidly developing energy technologies.

In the case of the last subfields an attempt is made to also identify the niche fields where reliable technologies are already in place elsewhere in the world, the implementation of which in Estonia would be economically justified.

In the case of R&D the main objectives include the generation of internationally competitive human resource in research institutions and universities, supporting undertakings in developing and mobilising new technologies in the field of energy and facilitating cooperation between undertakings and researchers and facilitating work for the sake of their common objectives.

The planned budget of the programme for the five years is approximately EEK 500 million. Through different measures the programme involves four ministries: the Ministry of Economic Affairs and Communications, the Ministry of Education and Research, the Ministry of Agriculture and the Ministry of the Environment.

²³ <http://www.eas.ee/index.php/ettevotjale/innovatsioon/energiatehnoloogia-programm/uldist>.

The lead ministry of the programme is the Ministry of Economic Affairs and Communications, at which the steering committee of the programme was formed. The steering committee consists of representatives of ministries, organisations representative of entrepreneurship in the field, research institutions and the area of higher education. The implementation of the programme is coordinated by the programme manager. The programme lasts from Q2 of 2008 to the end of Q1 of 2013²⁴.

The priority areas of development set out in the ETP are the following:

- 1) oil shale technologies according to the development topics listed below;
- 2) new energy technologies based mainly on renewable energy sources and optimisation of the operation of the energy system related thereto according to the development topics listed below.

The criteria for development of the priority areas set out in the ETP are:

- energy conservation and effective use of resources,
- environmental friendliness,
- increased value added,
- increasing R&D investment in the field,
- developing human resources relating to R&D in the field,
- increasing revenue from sale of intellectual property rights.

The priority of the Energy Technology Programme in promoting the use of energy from renewable sources is to encourage the development of new technologies and the most important areas of development are the following:

- solar energy (ETP area of development No 10);
- fuel cells and electrolysers (ETP area of development No 11);
- development and application of the production technology of second-generation biofuels (ETP area of development No 12);
- development of electrical energy storage and wind power balancing technologies (ETP area of development No 13);
- development of energy technologies based on the treatment of biomass and biodegradable waste (ETP area of development No 14);
- development of the transmission and distribution networks and optimisation of the energy system (ETP area of development No 15).

9. Development Plan for Enhancing the Use of Biomass and Bioenergy for the Period 2007 to 2013 – R&D

Under [the Development Plan for Enhancing the Use of Biomass and Bioenergy for the Period 2007 to 2013](#) R&D whose outputs are aimed at farmers were financed through the RDF. The committee of the Development Plan for Enhancing the Use of Biomass and Bioenergy ordered surveys related to biomass and bioenergy according to the needs arising from the analysis of the performance of the Development Plan. The financing of (applied) research

²⁴ <http://www.valitsus.ee/?id=7434>.

related mainly to biomass, but also to bioenergy can be applied for under the National Programme “Applied Research and Development in Agriculture for the Period 2009 to 2014”. Two out of the 30 applied research projects that received support in 2009 are related to bioenergy:

- 1) Use of agricultural crops for burning and biogas; assortment and agrotechnology for the implementation of which EEK 530 000 were allocated.
- 2) Economic assessment of growing and using energy crop (reed canary grass) in Estonia for the implementation of which EEK 381 959 were allocated.

4.2 Specific measures to fulfil the requirements under Articles 13, 14, 16 and Articles 17 to 21 of Directive 2009/28/EC

4.2.1 Administrative procedures and spatial planning (Article 13(1) of Directive 2009/28/EC)

Pursuant to the Electricity Market Act:

In accordance with the Electricity Market Act (hereinafter the EMA) market participants are electricity undertakings, customers, balance providers and power exchange operators:

- Electricity undertakings are producers, network operators, line possessors and sellers;
- Customers are persons who use electricity for their own purposes and household customers are customers using electricity for their own household consumption, excluding commercial or professional activities;
- A balance provider is a person who has entered into a balance agreement with a system operator to maintain its balance;
- A power exchange operator is a person who, based on an agreement entered into with a system operator, ensures the operation of the power exchange and the opportunity to trade there with electricity or a person who has entered into the aforementioned contract with a system operator and who has an experience in operating an international power exchange and the annual turnover of the power exchange operated by whom is at least 50 TWh at a power exchange trading with supplies of the following day and at least 0.5 TWh at a power exchange trading with supplies of the same day. To ensure regular and legitimate activities of a power exchange, the power exchange operator establishes the rules and regulations of the power exchange and publishes these on its website not later than two months before the date the power exchange commences its activities.

The EMA defines electricity undertakings as follows:

- A producer is an electricity undertaking engaged in the generation of electricity by means of one or several generating installations; a small producer is a producer whose generating installations located in Estonia have a net capacity not exceeding 10 MW; and a cogenerator is a person who generates power in an efficient cogeneration scheme. The requirements for efficient cogeneration [shall be established by the Minister of Economic Affairs and Communications](#) on the basis of the methodology set out in Annex III to Directive 2004/8/EC of the European Parliament and of the Council on the promotion of cogeneration based on a useful head demand in the

internal energy market and amending Directive 92/42/EEC (OJ L 052, 21.02.2004, pp. 50–60).

- A network operator is an electricity undertaking engaged in the provision of network services through a network.
- A transmission network operator is an electricity undertaking engaged in the provision of network services through a transmission network.
- A distribution network operator is an electricity undertaking engaged in the provision of network services through a distribution network.
- A line possessor is an electricity undertaking that uses a direct line or a direct current line crossing the state border to transmit electricity.
- A seller is an electricity undertaking engaged in the sale of electricity.
- A trader on power exchange is a market participant to whom the power exchange operator has granted a right to trade on the power exchange through a relevant agreement.

An activity licence is a right granted to a person by a decision of the Competition Authority to operate in accordance with the conditions of the activity licence as determined by the EMA. An activity licence becomes invalid when the term of the licence expires and no applications for extending the term have been presented.

In accordance with the Electricity Market Act an activity licence is required in order to:

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

In order to obtain an activity licence, a person shall submit an application to the Competition Authority in which the applicant sets out the following information: name, address of the seat, and place of business, telecommunications numbers, commercial registry code, unless the applicant is being founded, the activity for which the activity licence is being applied for and as precise description of the activity as possible. The following shall be appended to the aforementioned application: in the case of a company being founded, a certified copy of the memorandum of association or the foundation resolution, a document containing information proving that the requirements provided for in this Act or legislation established on the basis thereof concerning the applicant and the activity applied for have been complied with. At the request of the Competition Authority, an applicant shall also prove that all the requirements provided for in the EMA or legislation established on the basis thereof concerning the applicant and the activity applied for have been complied with.

In applying for an activity licence for generation of electricity the following shall also be submitted: the technical specifications of the generating installation and data regarding the

energy efficiency of the installation and security of supply and a description of the natural conditions in and any other factors relevant to the location of the generating installation.

The Competition Authority shall make a decision to issue or to refuse to issue an activity licence on the basis of an application submitted pursuant to this Act and information submitted additionally at the request of the Competition Authority, in accordance with the principles of equal treatment and transparency and the provisions of this Act and legislation established on the basis thereof. A decision shall be made within 60 days of receipt of the information and documents. Decisions shall be reasoned. Before deciding to refuse to issue an activity licence, the Competition Authority shall send a corresponding notice to the applicant wherein the reasons for refusal are set out and shall grant a reasonable term for elimination of the circumstances preventing the issue of the activity licence. An applicant shall be notified of the decision to issue or to refuse to issue an activity licence in writing within three working days of the decision being made. The Competition Authority shall enter the data in the register of economic activities within three working days of the date on which the relevant decision was made. If the Competition Authority refuses to issue an activity licence for an activity, the Competition Authority shall forward a notice to this effect to the European Commission. The notice shall indicate the grounds for refusal to issue an activity licence. A state fee for the licence and for any amendment of the licence on the initiative of the holder of the licence shall be paid pursuant to the procedure and at the rate set out in the State Fees Act.

The conformity of a generating installation shall be confirmed by the system operator if the net capacity of the generating installation exceeds 5 MW. A generating installation shall be deemed compliant as from the date of issue of the aforementioned confirmation. The length of the test period and other conditions related to tests shall be set out in the grid code. If a European production certificate has been issued to a generating installation, no additional testing of the generating installation in respect of the parameters and functions covered by the production certificate shall be required.

The Competition Authority shall issue, revoke and extend activity licences, establish and amend conditions of activity licences and inspect the performance thereof.

In addition to the Electricity Market Act the Ministry of Economic Affairs and Communications is also responsible for drawing up and amending the Building Act and its implementing legislation.

Pursuant to the Planning Act:

The Ministry of the Interior is responsible for drawing up the Planning Act and its implementing legislation and for preparing a national spatial plan. County governments are responsible for preparing county plans and local authorities are responsible for drawing up comprehensive and detailed plans and for exercising construction supervision (including the issue of building permits). The preparation of detailed plans is mandatory for areas located in cities and towns and for existing or planned, clearly delimited built-up parts of small towns and villages.

The relevant local authority shall also establish the building regulation for a rural municipality or city to:

- 1) establish rules for planning and building in the rural municipality or city territory, not including the determination of land use provisions and building provisions;

2) determine of the division of the internal functions of the local authority and establish the procedure in administration in the field of planning and building.

A local authority may establish on immovable property land use provisions, building provisions and restrictions arising from law on the basis of the following plans:

- 1) on the basis of an adopted detailed plan where preparation of a detailed plan is mandatory;
- 2) on the basis of an adopted comprehensive plan where preparation of a detailed plan is not mandatory.

Building permits and permits for use are also issued by local authorities. The approval of other authorities, except that of other authorities under the conditions established in the EMA, is not required in developing projects related to renewable energy. The Estonian state authorities, county governments and local authorities are not engaged in certification and licensing. Licences and certificates approved in the European Union are recognised.

There are no national regulations in place for taking into account the peculiarities of renewable energy technologies. After the assessment of the efficiency of different technologies and the availability and optimal distribution of the resources thereof, there are plans to develop recommendations for local authorities in taking into account the optimality of solutions offered in processing applications.

There are no specific national rules concerning the certification and licensing procedures in Estonia. By 31 March 2011 an assessment will be made of the need to establish national rules concerning the certification and licensing procedures applied to plants and associated transmission and distribution network infrastructure for the production of electricity, heating or cooling from renewable sources, and to the process of transformation of biomass into biofuels and other energy products.

According to the results of the SUPPORT_ERS (2008–2010) project financed by the Intelligent Energy Europe (IEE) – during which interviews were also conducted with producers and developers involved in renewable energy – no unnecessary obstacles have been detected and no non-proportionate requirements have been submitted in the case of the state or local authorities. As planning activities are public and public disclosure is mandatory in order to ensure the involvement of all interested persons and the timely provision of information to such persons and to enable such persons to defend their interests in the planning process, the authorisation procedure for these projects also takes quite a long time.

Thus far, training events and introductory seminars have been organised to provide information to architects, representatives of local authorities and other parties involved in plans. Training events usually follow the development of new measures. More specific mechanisms will be developed to make comprehensive information on the processing of authorisation, certification and licensing applications and on assistance available to applicants by the end of 2012.

There are no specific procedures for small-scale, decentralised installations, but there are also no restrictions on the use of small-scale, decentralised installations in the case of buildings. Service fees have been specified in the State Fees Act and these are generally related to administrative costs or a certain percentage of the amount of the transaction value.

Pursuant to the Planning Act of Estonia local authorities enjoy complete freedom in planning and designing industrial and residential areas and these must be in compliance with established legislation. When preparing plans, local authorities must proceed from the

provisions of a county plan or a national spatial plan. To adhere to the requirements of Directive 2009/28/EC, information provision activities are planned for all participants in the planning process, particularly for planners and architects to help them to properly consider the optimal combination of renewable energy sources, high efficiency technologies and district heating and cooling when refurbishing, planning, designing, building and renovating industrial or residential areas.

In Estonia there are no special case handlers of authorisation, certification and licensing procedures of renewable energy installations, this is one part of the planning and building activities and also of the relevant training.

The action planned pursuant to the Renewable Energy Directive:

ACTION 4.2.1	Updating legislation of certification and licensing procedures	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - To assess the need for establishing national rules concerning the certification and licensing procedures applied to plants and associated transmission and distribution network infrastructure for the production of electricity, heating or cooling from renewable sources, and to the process of transformation of biomass into biofuels and other energy products. - Based on the conducted analyses, supplementation of legislation and development of guidance 	
	Results and indicators	Target value and deadline
RESPONSIBLE	Ministry of Economic Affairs and Communications, Climate and Energy Agency (hereinafter the KENA)	

4.2.2 Technical specifications (Article 13(2) of Directive 2009/28/EC)

Pursuant to Article 13(2) of 2009/28/EC, Member States shall clearly define any technical specifications that must be met by renewable energy equipment and systems in order to benefit from support schemes. The Estonian state does not itself impose any restrictions on renewable energy equipment and applies to renewable energy equipment subject to support only technical requirements arising from the EU legislation. More exact requirements for equipment may be established by infrastructure managers only on the basis of legislation.

4.2.3 Buildings (Article 13(3) of Directive 2009/28/EC)

The mobilisation of renewable energy must also be promoted through the introduction of local generating installations using renewable energy. In accordance with the Directive the direct supply of heat or cooling through district heating and cooling in buildings could also be taken into account.

No national and regional legislation concerning the increase of the share of energy from renewable sources and no minimum requirements for the use of renewable energy in the building sector in Estonia have been established, but it has been planned to develop requirements to be added to the Building Act and legislation issued on the basis thereof. There is also no statistical data about the share of renewable energy in the building sector. The authority responsible for the development of the legal area related to buildings is the Ministry

of Economic Affairs and Communications. At local level local authorities have the right to establish with rules additional technical requirements for increasing the use of renewable energy in new buildings.

From 1 January 2012 onwards, new legislation and rules will ensure the exemplary role of new and existing public buildings at regional and local level that undergo large-scale renovation by using renewable energy in the building sector. The obligation can also be deemed as fulfilled as regards observing the standards of zero-energy buildings or by prescribing that the roofs of public or private or commonly used buildings are usable by third parties for renewable energy installations.

By 31 December 2014 an analysis will be made regarding the expediency of applying minimum levels of renewable energy in new and renovated buildings and, if necessary, building legislation and rules will be developed to establish the minimum level of energy use from renewable energy sources in the case of new and existing buildings that undergo large-scale renovation.

Under the support schemes of the Estonian-Swiss Cooperation Programme and of the Climate and Energy Agency of the Estonian KredEx Credit and Export Guarantee Fund the Ministry of Economic Affairs and Communications has commenced activities for completing sample low-energy buildings. On the basis of the results thereof further steps will be planned for the development of technical standards related to the mobilisation of renewable energy. It has been planned to connect the process of constructing sample buildings insofar as possible with training events for specialists working in the building sector and this will reveal more detailed possibilities for increasing the share of renewable energy in buildings.

The action planned pursuant to the Renewable Energy Directive:

ACTION 4.2.3	Promotion of mobilisation of renewable energy in buildings and through the building policy	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - Establishment of sample buildings that may be classified as low-energy buildings, training activities to specialists of the building sector during the establishment of sample buildings. - Collection of information and organisation of analyses required for preparing forecasts for the use of renewable energy in buildings. - Development of national building legislation and rules to establish the minimum level of energy use from renewable energy sources in the case of new and existing public sector buildings that undergo large-scale renovation. 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Developed position on how to ensure the exemplary role of the public sector in mobilising renewable energy in new and substantially reconstructed buildings.	1 January 2012
	Building legislation complies with the	31 December 2014

	requirements of the Directive	
RESPONSIBLE	Ministry of Economic Affairs and Communications, the KENA	

4.2.4 Information provisions (Articles 14(1), 14(2) and 14(4) of Directive 2009/28/EC)

No separate legislation related to information and awareness raising campaigns and programmes in the field of renewable energy has been established or developed; however, appropriate EU directives about the energy labelling of equipment used in households have been transposed. Project-based events related to the provision of information have been organised on a constant basis at national, regional and local levels and the events will continue in the future as well. In addition to national, regional and local institutions a certain role in the information provision activities is played by professional associations uniting companies of the field.

When publishing information on support measures the practice applicable by authorities is to publish all information related to the support measure, including information on processing single applications. Indeed, all information on the applied support measures (support measures for the use of renewable energy sources in electricity, heating and cooling and transport sector) is already available in full to the Estonian public. When applying new support measures or updating the existing ones, relevant information is published by the Implementing Authorities on their websites or in other manners.

Information on the net benefits, costs and energy efficiency of equipment and systems using renewable energy sources for heating, cooling and electricity is published as a rule by the supplier of the equipment or system.

No official guidance is provided at the national level for planners and architects to help them to properly consider the optimal combination of renewable energy sources, high efficiency technologies and district heating and cooling when planning, designing, building and renovating industrial or residential areas. Although planners and architects use information available in Europe and elsewhere in the world when making their choices, the specialists' skills develop particularly during their studies in higher educational institutions, in-service training events and while solving practical tasks. The scheme is implemented observing the availability of information materials and assessing the need for drawing up additional materials.

At the national level no guidance for information provision to citizens has been developed; the information provision is performed or ordered by authorities responsible for the implementation of the energy policy of the state, by different unions and professional associations who use information available in Europe and elsewhere in the world.

The action planned pursuant to the Renewable Energy Directive:

ACTION 4.2.4	Organisation of information provision	
MOST IMPORTANT ACTIONS	Constant analysis, planning and organisation of information provision activities	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	The structures required for the organisation of information provision are in place and the interest groups and experts have been informed of trends in renewable energy	Constant action
RESPONSIBLE	Ministry of Economic Affairs and Communications, the KENA	

4.2.5 Certification of installers (Article 14(3) of Directive 2009/28/EC)

No national and/or regional legislation concerning certification or equivalent qualification schemes for installers according to Article 14(3) of the Directive 2009/28/EC have been established in Estonia:

No responsible body has so far been designated for setting up certification/qualification schemes by 2012 for installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps. To preserve the warranty conditions of equipment, until today the producers and importers of equipment have taken care of training installers and information on persons engaged in installation and maintenance is mostly available through the Internet.

The action planned pursuant to the Renewable Energy Directive:

ACTION 4.2.5	Setting up a certification/qualification system for installers	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - Development of certification/qualification schemes for installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps. - Designation of authorities/organisations responsible for the qualification process 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	The requirements of the Directive have been fulfilled	31 December 2012
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of Education and Research	

4.2.6 Electricity infrastructure development (Article 16(1) and Article 16(3) to (6) of Directive 2009/28/EC)

The rights and obligations of the electricity market participants have been set out in the Electricity Market Act. The requirements related to the connection to power networks have been described in the grid code. The conditions for the connection to the network shall be

issued by the network operator, these shall comply with the Electricity Market Act and legislation established on the basis thereof and shall be published on the website of the network operator. The information shall include technical requirements established for the connection to the network and the principles of calculating the charges payable for the connection to the network and for the amendment of the consumption or generation conditions, i.e. the connection conditions. According to law the connection conditions shall be transparent and in accordance with the principle of equal treatment. Supervision over the observance of the aforementioned principles shall be exercised by the Competition Authority.

The charges payable for network services provided by a network operator are as follows:

- 1) a charge for connection to the network;
- 2) a charge for amendment of the consumption or generation conditions;
- 3) a charge for enabling a network connection to be used;
- 4) a charge for the transmission of electricity;
- 5) charges for extra services directly related to network services.

A network operator shall set the transmission charge such that market participants who have paid a connection charge and a charge for use of the network connection are ensured that electricity will be transmitted throughout the entire system; at the same time network charges may differ from one network operator to another. Investments are made according to investment plans and financed out of the transmission charges, i.e. rates.

The condition of power networks in Estonia does not allow the connection of a sufficient number of connected parties related to wind power; therefore, relevant measures have been planned in the National Development Plan of the Energy Sector up to 2020 (also chapter 4.3).

In accordance with the National Development Plan of the Energy Sector up to 2020 one of the main objectives is to ensure continuous energy supply for the Estonian population. For this purpose it has been planned to diversify energy supply through the construction of new connections and more even distribution of energy sources in the energy balance.

To attain the objective, the Development Plan prescribes:

- development and implementation of support schemes for renewable energy sources;
- development and implementation of support schemes for cogeneration;
- construction of new electricity infrastructures from the Baltic States to other EU countries;

To attain the same objective, it has also been planned to supplement legislation in the field of security of supply.

Under the measure an analysis is made of the provisions concerning security of supply of legislation regulating the energy sector and adequacy of the effect thereof and necessary amendments to legislation are prepared and brought into force. As a result, the quality indicators of network services will improve by 10% by 2015. The Development Plan prescribes the development and enforcement of amendments to legislation during 2010.

Furthermore, the measure for the development of energy technologies in the National Development Plan of the Energy Sector up to 2020 prescribes development of the transmission and distribution networks and optimisation of the energy system and development of electrical energy storage and wind power balancing technologies. The work

of the programme for the development of energy technologies has started and it is managed by the programme coordinator (see chapter 4.1).

4.2.7 Electricity network operation (Article 16(2) and Article 16(7) and (8) of Directive 2009/28/EC)

Despite transparent and non-discriminatory criteria, there have been problems with the transmission of electricity produced by generating installations using only wind power as the needs for the secure operation of the national electricity system and the existing electricity infrastructure do not allow that in the full volume. Taking into account the very high share of the wind power potential in percentages in Estonian conditions, relevant measures have been planned (see chapters 4.2.6 and 4.3).

Plants generating electricity from renewable energy sources are integrated into the electricity market in accordance with the Electricity Market Act and this has been described in chapters 4.2.6 and 4.2.1.

The transmission and distribution tariffs for generators of electricity from renewable energy sources are the same as those for all producers and the principles behind these have been described in chapter 4.2.6.

4.2.8 Biogas integration into the natural gas network (Article 16(7) and Article 16(9) and (10) of Directive 2009/28/EC)

No technical quality standards have been established for gas from renewable energy sources, due to which it is not possible to sell it into the network. Similarly, other legislation does not describe the sales of gas from renewable energy through the gas network either.

In Estonia biogas is produced in small quantities and the production is dispersed. In 2006, 2,099,189 tons of manure with an energetic value of 400 GWh were generated in Estonia. If to consider that one-half of it could be used to produce biogas, this would form approximately 200 GWh of primary energy. In addition, there are 3–4 sewage treatment plants whose capacity allows the production of biogas and all of which remain in use on the spot to meet the needs of the company. Biogas collected from existing or closed landfills is used either for the needs of the company or in order to produce heat for the residential district located in the vicinity.

Until today no sufficient resources have been found to produce biogas and sell it into the network in a larger volume. Generally, the produced biogas is consumed for local needs and until today the biogas producers have not shown any interest in the production of biomethane.

During the harmonisation of Directive 2009/28/EC the issue about the biogas integration into the natural gas network will be revised.

4.2.9 District heating and cooling infrastructure development (Article 16(11) of Directive 2009/28/EC)

District heating infrastructure development is within the capacity of local authorities. In most of the settlements with district heating in Estonia local authorities have determined district heating regions in comprehensive plans. Similarly, approximately one-half of the local

authorities have drawn up development plans for the development of relevant infrastructures. Currently investment support favours projects based on established development plans.

4.2.10 Biofuels and other bioliquids – sustainability criteria and verification of compliance (Articles 17 to 21 of Directive 2009/28/EC)

According to the fields the responsibility is divided as follows: forest and natural grasslands – the Environmental Board, agriculture – the ARIB, bioliquids – the Tax and Customs Board.

The intended use of land has mostly been determined on the basis of the Land Cadastre Act and the intended use is amended with comprehensive plans. The registrar of land cadastre is the Land Board. Activities on natural protected areas are coordinated and authorised by the Environmental Board. A forest owner submits a forest notification concerning planned cuttings, planned reforestation, forest damage and objects of cultural heritage, and the Environmental Board either permits or does not permit the activity. The state supports private forest owners in drawing up forest management plans and providing counselling in the form of agricultural advisers. After clearcutting, the owner is obliged to carry out reforestation of the clearcut area within five years. The use of agricultural land is monitored by the ARIB.

Protected areas form 18% of the territory of Estonia. All activities on protected areas take place with the permission of the administrator of the protected area.

By the rules of the Nature Conservation Act, protected natural objects are:

- 1) protected areas;
- 2) special conservation areas;
- 3) protected species, fossils and minerals;
- 4) species protection sites;
- 5) individual protected natural objects;
- 6) natural objects protected at the level of local authorities.

Protected areas are areas maintained in a state unaltered by human activity or used subject to special requirements where the natural environment is preserved, protected, restored, researched or introduced. Protected areas are:

- 1) national parks;
- 2) nature conservation areas;
- 3) landscape conservation areas.

Without the express consent of the administrator of a protected natural object, the following is prohibited within a protected area, special conservation area, species protection site or protective zone of an individual protected natural object:

- to change the boundaries of the areas of the land use types and the intended use or uses thereof;
- to prepare a land readjustment plan and to perform land readjustment activities;
- to issue a forest management plan;
- to establish a detailed plan and a comprehensive plan;

- to grant consent for the construction of small construction works, including boat landings;
- to issue design criteria;
- to issue building permits;
- to create a new body of water the area of which is larger than five square metres if a permit for special use of water, building permit or consent for the construction of small construction works need not be issued for the purpose.

Supervision over bioliquids is exercised by the Tax and Customs Board, which maintains records on the import, export and sales quantities of bioliquids and verifies compliance with the requirements established for bioliquids in the future in accordance with the principles set out in legislation.

The action planned pursuant to the Renewable Energy Directive:

ACTION 4.2.10	Organisation of compliance with sustainability criteria	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - Assessment of compliance with sustainability criteria and analysis of the need for attestation and planning and implementation of principles of relevant organisation. - Designation of responsible authority/authorities 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	The requirements of the Directive have been fulfilled	31 December 2012
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of the Environment, Ministry of Agriculture, Ministry of Finance	

4.3 Support schemes to promote the use of energy from renewable resources in electricity applied by the Member State or a group of Member States

The following is a description of main measures that help develop the generation of electricity from renewable sources:

ACTION 4.3.1	Implementation of feed-in tariffs for the generation of electricity from renewable sources	
BACKGROUND OF THE MEASURE	<p>Feed-in tariffs must ensure a guarantee for developers/producers to forecast cash flow in order to finance building of production capacities. In accordance with the Electricity Market Act (abbreviated as the EMA) the principle applicable in payment of support is that support may be paid for a generated electricity unit within 12 years at a certain price regardless of the market price of electricity and the cost of investments. In accordance with the EMA the transmission network operator shall pay support to the producer on the basis of the producer's application as follows (as from 1 July 2010):</p> <ol style="list-style-type: none"> 1) EEK 0.84/kWh if the electricity is generated pursuant to Section 59(1)(1) or (2) of the Electricity Market Act; 2) EEK 0.50/kWh if the electricity is generated pursuant to 	

	<p>Section 59(1)(3) or (4) of the Electricity Market Act;</p> <p>3) for one kW/h of electricity at the rate specified in Section 59(2)(1) or (2) of the Electricity Market Act or at the rate approved by the Estonian Competition Authority if the electricity is generated in an efficient cogeneration scheme from a renewable energy source or from peat;</p> <p>4) EEK 0.25/kWh for the use of the net capacity specified in Sections 59(1)(5) and 108(11) of the Electricity Market Act if the unit price of the greenhouse gas emission limit is more than EUR 20.00 for a ton;</p> <p>5) EEK 0.23/kWh for the use of the net capacity specified in Sections 59(1)(5) and 108(11) of the Electricity Market Act if the unit price of the greenhouse gas emission limit is EUR 15.00–20.00 for a ton;</p> <p>6) EEK 0.22/kWh for the use of the net capacity specified in Sections 59(1)(5) and 108(11) of the Electricity Market Act if the unit price of the greenhouse gas emission limit is EUR 10.00–14.99 for a ton.</p>	
PERFORMANCE INDICATORS	up to 1400 GWh/a of wind power, an increase in the share of renewable electricity to 15...20% of final electricity consumption	
MOST IMPORTANT ACTIONS	- Monitoring and analysis of the impact and efficiency of support systems, amendment of the support system, where appropriate.	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	An amendment to the Electricity Market Act regarding support has entered into force	On an ongoing basis according to the results of the analysis
RESPONSIBLE	Ministry of Economic Affairs and Communications	
FINANCING	Tariffs established for customers	

ACTION 4.3.2	Support for investment in onshore wind farms	
BACKGROUND OF THE MEASURE	Supporting investments in onshore wind farms without encumbering the consumer with an additional tariff when financing cooperation mechanisms.	
PERFORMANCE INDICATORS	Installed onshore wind farm capacities of up to 100 MW	
MOST IMPORTANT ACTIONS	- Supporting investments in onshore wind farms.	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Installed capacities of up to 100 MW	2020
RESPONSIBLE	Ministry of Economic Affairs and Communications	
FINANCING	Other state budget funds	

ACTION 4.3.3	Support for investment in offshore wind farms	
BACKGROUND OF THE MEASURE	In Estonia the application of wind power for the generation of electricity may prove to be economically more favourable than in other EU regions. This makes investment in the development of wind power in Estonia interesting for those countries that would have difficulty meeting the objectives arising from the Renewable Energy Directive. Pursuant to the Directive, countries may launch cooperation projects that contribute to the attainment of the objectives arising from the Directive. When applying cooperation mechanisms on the initiative of other countries, the consumer is not encumbered with an additional tariff for supporting investments in offshore wind farms.	
PERFORMANCE INDICATORS	Installed offshore wind farm capacities of up to 500 MW (Development Plan of the Estonian Electricity Sector until 2018)	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - Researching possibilities for financing offshore wind farms by 2015 and supporting investment in finding non-tariff financing sources; - Ensuring the cooperation framework required for taking account of regional, socio-economic and internal security impacts in the offshore wind farm planning process 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	The financing schemes have been found and are functioning	2015
RESPONSIBLE	Ministry of Economic Affairs and Communications	
FINANCING	Other state budget funds	

ACTION 4.3.4	Development of power networks in accordance with the Electricity Market Act (National Development Plan of the Energy Sector up to 2020)	
BACKGROUND OF THE MEASURE	Diversification of energy supply through the construction of new connections and more even distribution of energy sources in the energy balance	
PERFORMANCE INDICATORS	Reduction in the share of oil shale	
MOST IMPORTANT ACTIONS	- Construction of new electricity infrastructures from the Baltic States to other EU countries	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	New power connections have been constructed from the Baltic States to other EU countries, including Estlink 2	ESTLINK 2 functions in 2014
RESPONSIBLE	Ministry of Economic Affairs and Communications	
FINANCING	EU programme to aid economic recovery by granting Community financial assistance to projects in the field of energy (Estlink 2), other state budget funds	

ACTION 4.3.5	Encouraging electricity generation in smaller combined heat and power plants	
BACKGROUND OF THE MEASURE	As financing larger production capacities is possible through feed-in tariffs guaranteed by the Electricity Market Act, in the case of smaller capacities feed-in tariffs are not sufficient enough to cover shortages in financing.	
PERFORMANCE INDICATORS	Cogeneration is ensured in boiler plants that belong to local authorities and are transferred to biomass heating.	
MOST IMPORTANT ACTIONS	- Establishment of combined heat and power plants using renewable energy sources along with the infrastructure required for the network connection of generating installations up to 2 MW (power) / 4–7 MW (heat) (continuation through the Environmental Investment Centre of the measure that started in 2009)	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	4 MW (power) / 8 MW (heat)/a	By 2020 additional 30 MW (power) / 80 MW (heat)
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of the Environment	
FINANCING	Other state budget funds	

ACTION 4.3.6	Encouraging investments in additional emergency reserve capacities on the basis of the Electricity Market Act	
BACKGROUND OF THE MEASURE	To compensate for the work of wind power depending on the weather, the energy system needs compensating capacities for stable work	
PERFORMANCE INDICATORS	Compensating capacities are established to ensure a balance of electricity (as well as to cover calm periods in the case of wind generators).	
MOST IMPORTANT ACTIONS	- Launching compensating capacities of up to 300 MW	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Reserve capacities of 300 MW	300 MW / 2020
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of the Environment	
FINANCING	Other state budget funds and support according to the Electricity Market Act	

ACTION 4.3.7	Bringing distribution networks into compliance with the needs for distributed generation of electricity	
BACKGROUND OF THE MEASURE	Distributed generation from renewable sources requires local reconstruction of the distribution network.	
PERFORMANCE INDICATORS	Possibilities are established for building new distributed generation plants.	
MOST IMPORTANT	- Reconstruction of distribution networks for the development of	

ACTIONS	distributed generation of electricity within the charge for the power network distribution service.	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Up to 2 MW of power	30 MW of power / 2020
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of the Environment	
FINANCING	Other state budget funds and support according to the Electricity Market Act	

4.4 Support schemes to promote the use of energy from renewable resources in heating and cooling applied by the Member State or a group of Member States

The following is a description of main measures that help develop the generation of heat from renewable sources:

ACTION 4.4.1	Encouraging increase in biofuel production	
BACKGROUND OF THE MEASURE	Increasing the share of renewable energy requires more extensive mobilisation of biomass which in turn provides possibilities for diversification of the rural economy in the form of storage and initial processing of biomass (particularly measures 1.6 and 3.1 of the RDP)	
PERFORMANCE INDICATORS	Permanent as from 2008	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - Support for investment in adding value to forestry products: Support for purchasing machinery or equipment related to processing raw wood, including equipment required for the production of bioenergy (wood chippers, log splitters, etc.). - Ensuring environmental and energy sustainability, encouraging innovative investments, and enhancing biofuel production and use of bioenergy - Support for investment in the production of bioenergy (measure 1.4.3. of the RDP 2007–2013), support for investment in the diversification of production and improvement of competitiveness. One of the conditions of the measure is that at least 50% of the produced energy must be used in the farmer's own undertaking. Support is paid from 40% to 60% of the cost of expenditure eligible for investment. 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Increased supply of wood-based raw material to the field of energy	
RESPONSIBLE	Ministry of Agriculture	
FINANCING	European Agricultural Fund for Rural Development (EAFRD)	

ACTION 4.4.2	Encouraging the production and consumption of biogas	
BACKGROUND OF THE MEASURE	For the purpose of supporting farms and undertakings producing biogas in order to support undertakings generating renewable energy, measures have been launched only on the electricity market. However, the experience of other countries has shown that biogas is also a valuable resource as transport fuel.	
PERFORMANCE INDICATORS	Measures have been developed to extend the use of biogas and 0.5 PJ is received from biogas per year.	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - an analysis of the biogas support possibilities - continuing the support for investment in manure storage facilities (under RDP measure 1.4.2 “Investments in livestock buildings”) 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Increased biogas supply to the field of energy	Energy generated from biogas in 2020 forms 0.5 PJ
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of Agriculture (in cooperation with the Ministry of Finance)	
FINANCING	European Agricultural Fund for Rural Development (EAFRD)	

4.5 Support schemes to promote the use of energy from renewable resources in transport applied by the Member State or a group of Member States

Production of biofuels (transport fuels) and their use in transport sector.

Estonia imports all the petrol and diesel used in transport. According to Statistics Estonia, in 2008 fuel was used for the needs of transport as follows:

- diesel – 385 000 tons
- motor spirit – 320 000 tons

As of 1 January 2009 the number of vehicles registered in the traffic register was 657 094, of which 460 410 used petrol and 196 661 diesel.

According to the reports presented by producers of biofuel, in 2008 there was one handler of biofuels in Estonia who released biofuel for consumption (undenatured ethyl alcohol, CN code 2207 10 00) blended with varying proportions of petrol in the total amount of 2 849 777 litres and four handlers of biofuels who released biofuel for consumption (100% fatty acid methyl esters (FAME), CN code 3824 90 91) for using either purely or blended with diesel in the total amount of 3 560 804 litres. The share of biofuel in total consumption of petrol and diesel based on energy value is 0.6%.

The calculation is based on the following data:

- diesel – energy value 43 MJ/kg;
- petrol – energy value 44 MJ/kg;
- ethanol – energy value 27 MJ/kg;
- FAME – energy value 38.6 MJ/kg.

Pursuant to the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act biofuel shall be exempt from excise duty following issue of a permit by the European Commission and until the expiry of the permit. To apply exemption from excise duty to biofuel, a relevant permit was received from the European Commission with a letter signed on 27 July 2005. The term of validity of the permit for exemption of biofuel from excise duty is 6 years. The right to produce biofuel exempt from excise duty, transport it to Estonia and admit it to the market is granted by a biofuel permit issued on the basis of the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act.

In accordance with Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport most vehicles currently in circulation in the European Union are capable of using a low biofuel blend without any problem and selling fuel complying with the aforementioned standards does not require adding any specific labelling.

In attaining the objective of a 10% share of renewable energy, total consumption of fuels plays a significant role. Therefore it is important to encourage the acquisition of economical vehicles that would use less fuel. It is possible to achieve this by the imposition of tax on CO₂ emissions. This issue is of large social aspect. A large number of residents live in regions with insufficient public transport (particularly rural areas) and due to their low income they use older vehicles with large emissions. This concerns particularly residents in whose region public transport is insufficient, making it only possible for them to get around in a car. Therefore, at the moment it is difficult to find consensus in the society for the implementation of the measure.

To attain the 10% share of renewable energy in transport, the following measures have been planned:

ACTION 4.5.1	Establishment of the 5–7% blended fuel obligation on liquid fuels	
BACKGROUND OF THE MEASURE	As the objective for 2020 is to attain the 10% share of renewable energy in transport fuels, due to its regulatory character this measure allows the attainment thereof without incurring any specific extra costs. In most of the EU countries the relevant measure is already functioning and the expected result has been achieved.	
PERFORMANCE INDICATORS	5% of all the fuels used in transport are from renewable sources	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	<ul style="list-style-type: none"> - Performance of surveys to find and apply the maximum % for blending - Amendments to law have been prepared, coordinated and submitted to the Riigikogu (the Parliament of Estonia) for processing - Information provision activities 	2011 2012 5% of all the fuels used in transport are from renewable sources 2015
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of the Environment, Ministry of Finance	
FINANCING	State budget	

ACTION 4.5.2	Transfer of public transport to renewable energy	
BACKGROUND OF THE MEASURE	Approximately 5% of the fuels used in transport account for public transport. If 50% of it is 100% transferred to renewable energy, this will bring along an increase of approximately 2% in the use of biofuels.	
PERFORMANCE INDICATORS	An additional 2% of fuels used in transport are from renewable sources	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - development of the financing scheme, including considering the establishment of obligations to use renewable energy as a condition for government subsidy in procurements for passenger transport (2013) - support for investment in transfer of public transport to biofuels (and related infrastructure development) 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	An additional 2.0% of fuels used in transport are from renewable sources	2020
RESPONSIBLE	Ministry of Economic Affairs and Communications, Ministry of the Environment, county governments, local authorities	
FINANCING	Development of the scheme by the Ministry of Economic Affairs and Communications, financing investments according to the scheme	

ACTION 4.5.3	Use of alternative renewable energy sources in transport	
BACKGROUND OF THE MEASURE	According to the current assessment the fuel need of vehicles working on power and biogas and using other ²⁵ renewable energy sources covers a very small part of the fuels used in transport. The development of technology brings along an increase in the share of cars using alternative energy sources.	
PERFORMANCE INDICATORS	1% of the energy used in transport is from alternative renewable sources	
MOST IMPORTANT ACTIONS	<ul style="list-style-type: none"> - carrying out an analysis for the development of the use of alternative renewable energy sources in transport sector - development of infrastructures of charging points for electric cars - information provision activities - development (2012) and implementation of measures and financing scheme aimed at extending the use of vehicles using other alternative renewable energy sources 	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	As a result of an analysis measures have been planned	2013

²⁵ except biodiesel and bioethanol.

	1% of the fuels used in transport are from alternative sources	2020
RESPONSIBLE	Ministry of Economic Affairs and Communications, local authorities, the KENA, filling station chain operators	
FINANCING	Development of the scheme by the Ministry of Economic Affairs and Communications, financing measures according to the scheme	

ACTION 4.5.4	Influencing the structure of vehicle use	
BACKGROUND OF THE MEASURE	Environmentally friendly means of transport in Estonia are not valued very highly. In a situation where the price of more environmentally friendly means of transport exceeds that of conventional vehicles, people are not eager to spend more money. Therefore ways must be found to encourage buyers to prefer environmentally friendly solutions when choosing vehicles.	
PERFORMANCE INDICATORS	The quantity of fuels used in transport decreases 10% compared to the case where the measure is not implemented.	
MOST IMPORTANT ACTIONS	- Preparing an analysis for developing measures to influence the structure of vehicle use	
	Results and indicators	Target value and deadline
OUTPUT INDICATORS	Measures for influencing the structure of vehicle use have been developed and implemented	2012
	The quantity of fuels used in transport has decreased 10% compared to the case where the measure has not been implemented.	2020
RESPONSIBLE	Development of the scheme by the Ministry of Economic Affairs and Communications, financing measures according to the scheme	

4.6 Specific measures for promoting the use of energy from biomass

4.6.1 Biomass supply: both domestic and trade

Land resources

51.5% of the area of Estonia is under forests and a quarter of it is under agricultural land. The potential land resource for obtaining biomass in Estonia is approximately 3.7 million ha, of which more than 2.21 million ha is under forest. Total unused agricultural land accounts for 430 000 ha. Nowadays a part of the unused agricultural land has already been overgrown with bushes and no longer has any practical value as agricultural land. In the case of agricultural parcels eligible for support from the ARIB, 286 000 ha account for land in respect of which no applications for support have been submitted, i.e. provisionally unused land, of which 123 000 ha form completely unused parcels. Agricultural land located outside the ARIB

parcels accounts for approximately 147 000 hectares. An overwhelming majority of these areas is of a very small size on average, and is often natural grassland overgrown with bushes; therefore only a small part of the land is suitable for effective cultivation of energy crops. However, at the moment an important reserve for cultivating energy crops and increasing biomass production has been covered by applications for support in respect of extremely extensively managed agricultural land. Of the 840 000 hectares of the area-based aid applications, grassland maintained (cut) only for the purpose of support is estimated at more than 110 000 hectares. Based on the intended purpose, a summary has been drawn up regarding the division of land located on the ARIB parcels and a base map in respect of agricultural land and grassland areas can be prepared once further details have been added to the initial map layer. The cadastral maps in use covered 87.5% of the area of the ARIB parcels and profit-yielding land formed 97% of the areas covered. Changes in the intended purpose of land have a significant impact on the reuse of agricultural land eligible for support only on limited areas and are primarily of local importance.

The state owns in total 40% of forestland of which 37% is under the administration of the Ministry of the Environment. As a result of non-completion of the land reform, ownership has not been determined in respect of 17% of forestland.

Energy crop resources

Oil crops: rapeseed, turnip rapeseed, white mustard, camelina, oilseed hemp

Problems in cultivating rapeseed in Estonia include the limited growing area, considerable demand for herbicides and fertilisers, and diseases. Turnip rapeseed, white mustard and camelina compete for the same growing area and yield less, but what may be positive is the differences of these products, which may have a favourable impact for example on the quality of biodiesel produced. The only oil crop not included in this group is oilseed hemp. This old field crop has not been studied or cultivated much in recent decades; thus no diseases are currently known to threaten this crop. The production potential of oilseed hemp in Estonia is not known at the moment. In cultivating any oil crops for the production of biodiesel, uses should be created for the by-products of production in order to achieve additional added value. As when using any other energy crops, it is necessary to analyse the energy efficiency of the production chain in addition to its economic profitability when using oil crops for producing biodiesel (i.e. the ratio of the energy value of the energy products produced from the integral production cycle to the amount of energy spent on production). The growing area of oil crops (mainly rapeseed) remains within 50 000 hectares a year. The yield of 70 000–80 000 tonnes is not sufficient for the production of biodiesel fuel. The area under fodder crops and permanent grassland is used for producing forage.

Short rotation trees: willow, grey alder, birch, aspen

These are tree species growing naturally in Estonia and are characterised by a rapid increment of branches especially during the first years of growth. Cultivating such trees on short rotation arable lands (less than 15 years) is probably one of the most promising ways of supplying biomass in Estonia. The problem with cultivating crops of this group for biomass is the need for specialised harvesting machinery – a harvester that cuts twigs of different diameters growing closely together. Research conducted so far in Estonia shows that the most productive members of this group of energy crops are varieties of wicker and broad-leaved willow selected specifically for this purpose. The biomass of all plants of this group is mainly suitable for burning, but it is also possible to produce bioethanol from cellulose. The production level of willow plantations realistically achieved in production conditions reaches 10–12 tonnes of dry matter per hectare in a year, which corresponds to about 25–30 cubic

metres of forest wood increment. The maximum production results achieved in test plantations (even over 20 t/ha) imply a maximum growth potential in optimal site conditions.

Fast growing herbaceous crops: reed canary grass, fibre hemp, reed fescue

These are perennial species and the cost of starting to cultivate these crops is considerably lower. The only exception is fibre hemp, an old field crop with a very fast biomass growth, which has been neglected in recent decades. However, cultivating it is only possible with sufficiently fertile soil and fertilisation. Reed fescue as well as reed canary grass need a lot of moisture for growing; the need for fertilisers is lower in case of reed fescue. The yield of reed canary grass is somewhat lower than that of willow, but the technology for cultivating and harvesting exists and is easily available. A disadvantage is the short optimal harvest time – the crop is harvested in early spring when the stalks have dried. The use of reed canary grass in the production of biogas may prove to be promising. Galega may spread outside fields, thus its distribution must be controlled. In accordance with a regulation of the Minister of the Environment it is forbidden to cultivate the species on protected areas as it is resistant and spreads quickly, changes the structure of the community and allows only nitrophilous plants or plants tolerating high nitrogen content to grow there.

Ethanol crops: wheat, rye, triticale, potato, sugar beet

When using any of these species in the production of liquid fuels, the yield may be of less consistent quality and have a lower protein content than crops cultivated for food or fodder. The cost price of ethanol produced from cereals is lower than that of ethanol produced from potatoes, primarily due to the high storing and transport prices of the latter. In addition to the production of liquid fuels, all these crops are also suitable for producing biogas. When producing cereals, the burning of straw can be used as an added value. The use of sugar beet as an energy crop is limited as Estonia does not have a production quota, hence producers here do not get the aid that producers get in countries with a quota.

Natural grass plants: cuttable biomass from permanent grasslands or (semi-)natural communities, wetlands

Biomass from lands where plants are cut in order to preserve nature is suitable for using primarily in small-scale production, either for producing biogas or for incineration. More extensive using is limited by the low yield as compared to field crops, as well as the resulting high transport costs. Gathering reed and reed mace from wetlands for producing energy is also limited by the parallel usability of both species as building material. Possibilities of producing biogas from green vegetable mass have not been studied in Estonia so far. Domestic production of cereals, which is approximately 600 000–760 000 tonnes a year, does not suffice for domestic consumption as fodder, human food, for seeds as well as for industrial purposes, and an additional amount of cereals is imported every year. Although cereals cannot be regarded as biomass resources at the moment, cereals and primarily rye are the sources of industrial raw material with the greatest potential, taking into account the land resources.

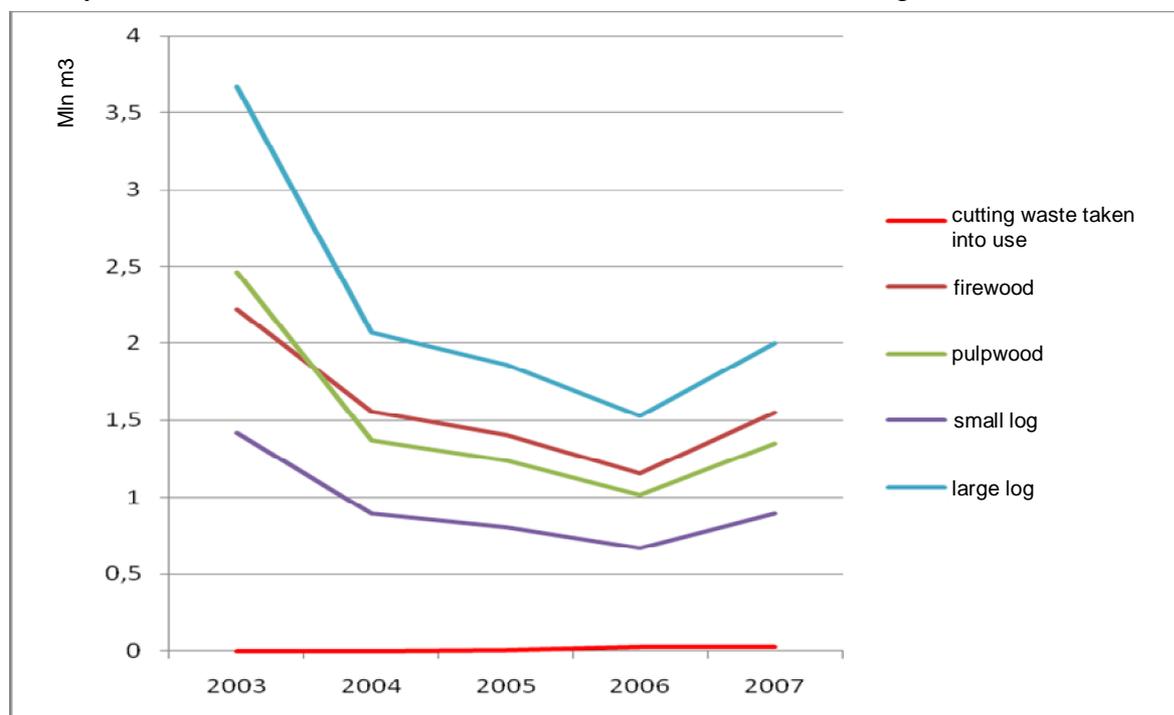
Forest resources

According to the Statistical Forest Inventory the area of the forestland in Estonia is 2.21 million hectares. More than half of the forest resources in Estonia have naturally developed during the past 100 years through the forestation of lands no longer used in agriculture. Such forests now make up a major part of private forests. The forecasts for the use of forest wood are fixed in forestry development plans for ten-year periods. According to the forecast for the years 2001–2010, the optimal annual cutting volume of growing forests (not including

sanitary cutting and thicket tending) was 12.6 million cubic metres, i.e. 5.6 cubic metres per hectare of forestland, provided that all forests in Estonia have found themselves an owner. According to the Forestry Development Plan up to 2020 that is being drawn up, the maximum wood use in Estonia's forests arising from their age distribution could reach on a short-term basis to 22 million m³ a year, while the long-term sustainable objective is 12–15 million m³ a year. The main problems in using biomass include the unstable extent of forest use, sometimes insufficient increment and low profitability of developing biomass used for bioenergy.

In Estonia, wood is the biofuel with the greatest economic potential for producing both heat energy and electricity. The total volume of different wood sources in 2006 was assessed as 9 399 000 m³ and in 2008 as 7 079 000 m³. The largest import article is unprocessed wood the volume of which in 2006 was 1 809 050 m³ and 564 100 m³ in 2008.

The dynamics of wood collection in Estonia is shown in the following chart.



Surveys performed have provided the following results:

1. According to the calculations each year 12–15 million m³ of wood could be cut in forests in Estonia, of which traditional firewood accounts approximately for 30% (“Wood Supply Scenarios...” <http://www.envir.ee/1113320>).
2. Until now deciduous tree resources, particularly grey alders, have been cut a little. Cutting waste (thin top ends and branches) is used a little. The biomass of branches and thorns forms approximately 35% of the biomass of the trunk wood.
3. In addition, stumps that hitherto have been left completely in the forest can also be used for fuel. The given calculations use only stumps received from clearcutting as the uprooting of stumps in the case of thinning would cause unjustified damage to the remaining trees. The quantity of potential stumps received from clearcutting is approximately 30% of the biomass of the trunk wood. The quantity of conifer stumps received from forests in Estonia each year could be 480 000 cubic metres.

4. When assessing the energetic potential of wood fuel, in addition to the wood fuels received from forest the biomass cut from non-forest lands (power line, ditch, road, etc., routes, parks, market gardens, etc.) must also be taken into account. As these are natural areas where most of the growing biomass is herbaceous, the production of self-growing wood is relatively modest. The total length of power lines was approximately 57 000 km. The power line routes passing forests cover 98 000 ha (“Potential Wood Use...” <http://www.envir.ee/1113320>), which produce approximately 42 000 tonnes of wood per year, i.e. 521 TJ of energy.
5. The estimated quantity of sawdust, wood chips and other wood waste created by sawmills in Estonia is 500 000 m³ (Wood Balance 2008).”

Waste

The use for producing energy has been studied primarily in connection with applying it as a possible alternative fuel for replacing non-renewable energy media, especially in the development of combined heat and power plants. The burning of waste can basically be divided into two technical solutions: mass combustion and combined combustion (RDF or refuse derived fuel combustion). Mass combustion is the burning of mixed municipal waste and certain industrial and construction-demolition waste of a high fuel value without special treatment. With the waste management hierarchy serving as a basis for the EU waste policy, Estonia aims to develop the separate collection of waste, the waste collected as a result of which is meant mainly for recycling as a material, but it may be economically justified to direct a certain part of the waste to the RDF production (e.g. in the case of separately collected packaging waste the so-called mixed plastics and dirty packaging waste). The development of waste management technologies and an increase in the prices of energy media have also generated interest in the production of different new products (including also liquid fuels) in the pyrolysis process regarded as an operation of recycling different low-quality plastic materials which due to economic reasons are not suitable for mechanic recycling (back to plastic).

RDF production requires entities that produce and combust RDF fuel. In Estonia the area is developing and in 2010 two entities are engaged in the RDF production in a larger volume while in the case of entities engaged in combustion the largest until today is AS Kunda NC. The RDF market is international: RDF produced in Estonia has been exported from Estonia and RDF has also been imported from elsewhere.

Both combined as well as direct combustion possibilities can exist in parallel. In 2010 Eesti Energia AS concluded a contract for the establishment of a mass combustion plant on the territory of the Iru thermal power station with a treatment capacity of 220 000 t/a.

The National Waste Management Plan (approved by a Government of the Republic Decision in May 2008) prescribes mass combustion as a suitable solution in the management of mixed waste remaining from separate collection. The plan of AS Eesti Energia for the establishment of an Iru waste combustion plant does not prescribe any financial support, i.e. this is the first extremely large-scale development based on the “polluter pays” (or also self-supporting) principle. At the moment there is significant competition between the mass combustion and MBT-based RDF producers – the wishes of different developers for the total waste quantities in their facilities are considerably larger than the estimated quantity of mixed waste generated in Estonia. Material suitable for producing RDF can be separated by the so-called mechanical-biological treatment of common waste, which results in the separation of materials with a

high fuel value from the general waste mass, at the same time the residual of the conventional MBT process is waste with a high share of biodegradable waste that requires separate handling and is following landfilling a source of greenhouse gases. The main waste arising in mass combustion is bottom ash, which forms approximately 20–25% of the initial mass and does not contain any biodegradable part any more. Ash is also either landfilled or used in certain cases in road construction (e.g. in the Netherlands, Denmark, etc.).

Wood waste is already used as an energy source. Paper, carton, certain types of plastic and household waste can also be used for producing energy. Waste incineration (also the co-incineration of RDF with some other fuel) must be in compliance with requirements set out in Directive 2000/76/EC on the incineration of waste and Regulation No 66 of the Minister of the Environment of 4 June 2004 Requirements for the Establishment, Operating and Closing of Waste Incineration Plants and Co-incineration Plants.

The National Waste Management Plan for 2008 presents a forecast based on the economic situation of 2007 in accordance with which by 2013 the quantity of municipal waste may increase approximately by 213 000 tons, i.e. to 700 000 tons a year and by 2013 the estimated quantity of packaging waste should be approximately 200 000 tons. Thus in 2013 the total primary energy potential of waste would be 13.5 PJ²⁶. At the same time the whole generating waste mass cannot be regarded as an input of waste combustion: a large part of packaging waste, like glass and metal, does not burn, and in the case of other materials the first preference is recycling as a material, not burning. According to the most recent data economic downturn has reduced waste quantities. Priority number one continues to be separate collection and through it also primary recycling of materials. Based on the aforementioned the estimated quantity of waste suitable and available for combustion is 300 000–400 000 t/a.

Thus, the potential amount of energy from waste would be:

$$300\,000\,000 * 10 \text{ MJ/kg (8-12 MJ/kg)} + 20\,000\,000 * 32.6 \text{ MJ/kg} = 3 + 0.65 = 3.65 \text{ PJ}$$

The estimated amount of mixed waste to be burnt would probably be no more than 300 000–350 000 t/a; in the case of materials that were initially separately collected the RDF potential is approximately 20 000 t/a. Larger RDF amount may come only on the account of the quantity of mixed waste, thus this does not change the total energy quantity in the calculation.

²⁶ 700 000 000 kg * 10 MJ/kg (8–12 MJ/kg) + 200 000 000 kg * 32.6 MJ/kg = 7 + 6.5 PJ = 13.5 PJ.

Table 7. Biomass supply in 2006

Sector of origin		Amount of domestic resource ²⁷	Imported		Exported	Net amount	Primary energy production (ktoe)
			EU	Non-EU	EU/non-EU		
(A) Biomass from forestry ²⁸	<i>Of which:</i>						
	1. Direct supply of wood biomass from forests and other wooded land for energy generation (m ³)	1 115 000	1 000	2 000	85 000		
	2. Indirect supply of wood biomass for energy generation (m ³)	2 500 000	0	0	0		
(B) Biomass from agriculture and fisheries	<i>Of which:</i>						
	1. Agricultural crops and fishery products directly provided for energy generation						
	2. Agricultural by-products/processed residues and fishery by-products for energy generation						
(C) Biomass from waste	<i>Of which:</i>						
	1. Biodegradable fraction of municipal solid waste including biowaste (biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants) and landfill gas						
	2. Biodegradable fraction of industrial waste (including paper, cardboard, pallets)						
	3. Sewage sludge		-	-	-	-	1.5

Table 7a. Estimated biomass domestic supply in 2015 and 2020

Sector of origin		2015		2020	
		Expected amount of domestic resource	Primary energy production (ktoe)	Expected amount of domestic resource	Primary energy production (ktoe)
(A) Biomass from forestry	1. Direct supply of wood biomass from forests and other wooded land for energy generation (m ³)	3 600 000		3 600 000	
	2. Indirect supply of wood biomass for energy generation				
(B) Biomass from agriculture and fisheries	1. Agricultural crops and fishery products directly provided for energy generation				
	2. Agricultural by-products/processed residues and fishery by-products for energy generation				
(C) Biomass from waste	1. Biodegradable fraction of municipal solid waste including biowaste (biodegradable garden and park waste, food				

²⁷ Amount of the resource in m³ (if possible, otherwise in appropriate alternative units) for category A and its subcategories and in tonnes for categories B and C and their subcategories.

²⁸ Biomass from forestry should also include biomass from forest-based industries. Under the category of biomass from forestry processed solid fuels, such as chips, pellets and briquettes should be included in the corresponding subcategories of origin.

	and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants) and landfill gas				
	2. Biodegradable fraction of industrial waste (including paper, cardboard, pallets)				
	3. Sewage sludge				2.0

Table 8. Current agricultural land use for production of crops dedicated to energy in 2006

Agricultural land use for production of dedicated energy crops	Surface (ha)
1. Land used for short rotation trees (willows, poplars)	
2. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum	

In Estonia, crops dedicated to energy (willows, poplars, grasses) are not cultivated on agricultural land. Residues of agricultural production and also grass and stalks received when cutting grass plants growing on natural and semi-natural grasslands are used.

The potential amount of energy received from natural and semi-natural grasslands (including flood meadows, wooded meadows, grasslands on mineral soil and reed beds) is unclear.

4.6.2 Measures to increase biomass availability, taking into account other biomass users (agriculture and forest-based sectors)

– Mobilisation of new biomass sources

For the mobilisation of new biomass sources in 2007 the Development Plan for Enhancing the Use of Biomass and Bioenergy for the Period 2007 to 2013 (hereinafter the DPB) was drawn up. The following is a brief overview of the lines of action and measures of the DPB, the implementation of which is planned to continue.

R&D in biomass and bioenergy

Bioenergy is studied in Estonia mostly at the Estonian University of Life Sciences and the Tallinn University of Technology (TUT), and to a smaller extent at the University of Tartu, the Estonian Research Institute of Agriculture and the Jõgeva Plant Breeding Institute, etc. A Centre of Renewable Energy has been established at the Estonian University of Life Sciences where primarily the suitability of different crops for producing bioenergy is studied, a list and characteristics of suitable woody and herbaceous plants have been compiled and initial analyses of economic profitability have been made.

At the Tallinn University of Technology, research in energy is focused on oil shale energy and this receives the bulk of research aid. The general energetic balance and the possibilities of using bioenergy to achieve this balance have also been studied to some extent. At the University of Technology, the burning-related characteristics of different substances as well as the construction of boilers have been studied in order to find a suitable technological solution for biomass. In the framework of the topic “Renewable energy resources in Estonia and expanding their use in the energy sector” (TUT) that is subject to targeted financing, theoretical and technical bioenergy resources, characteristics of new biofuels and possibilities of using them to produce heat and energy are addressed. Under this topic, several

thermotechnical tests of larger biofuel boilers and measurements of emissions have been carried out, during which specific emissions characteristic of biofuels have been determined. Regional and national development plans for the energy sector have been drawn up where the optimal use of local biofuel resources for producing energy is addressed. In the framework of the topics “Optimising the conversion processes of high-molecular organic substances: the chemical composition, characteristics and refining of products” (2001–2005) and “Fundamentals of combined thermochemical treatment of fossil and renewable fuels and organic waste” (2006–2008), both of which are subject to targeted financing, the principles of liquidising wood, wood bark, willow coppice, reed, thorns, reed mace, etc., have been and are studied. In other parts of the world, biomass is also used for producing fuel oil. At the University of Tartu, the bioproduction of wetlands, fermentation processes and environmental technologies have been studied. For the national development activities and granted aids to be effective, it is important to decide which types of bioenergy are the most optimal in the local conditions. For this purpose it is necessary to ensure the existence of know-how for all types of bioenergy production (biogas, bioliquids, producing heat and energy from biomass). So far, different areas of bioenergy have been studied in different research establishments. Implementation of the field-specific research, development, studying and education potential in the implementation of the Renewable Energy Action Plan takes place through the implementation of the Energy Technology Programme.

Information about biomass and bioenergy

Statistical data

To have a clear overview of the development of the field and to allow for planning the necessary development activities, the required statistical data must be made available. National statistical surveys are complemented with the indicators of biomass and bioenergy production. Data is required on biomass production broken down by type (arable crops, forest, waste) and on biomass use broken down by fields (electric power, heat, transport fuel and materials production) and on the resources channelled into the development of the area to assess the efficiency of the actions. Prices on the biomass and bioenergy market are also observed.

Dissemination of information

The knowledge of all market participants – the public sector, researchers, entrepreneurs and consumers – can be improved. For that purpose, information about the field must be systematically collected, analysed, processed and disseminated. The main actions concerned are the creation of a homepage presenting the field information, through which regularly updated know-how can be communicated, and organisation of events (exhibitions, seminars, study trips). Prizes to recognise the best undertakings (among both biomass producers and users) are awarded each year to promote the production of biomass and bioenergy.

The collection Biomass User Handbook has been published concerning biofuels, which among other things gives an overview of the practical experience in applying modern biofuel combustion technologies in Estonia and in other countries located by the Baltic Sea.

Counselling

Field-specific counselling is developed on the basis of the following principles:

- Research, development, studying and education must provide the competence needed for developing the market, and for business

- The planning and creation of the required infrastructure must provide a basis necessary for research, development and education.

International cooperation on biomass and bioenergy

As regards international cooperation, it is important to found it on an as wide as possible basis, covering research, organisation of events and potential joint projects. This above all applies to possible projects for producing bioenergy, taking into account that because of their high cost it is more reasonable to share the costs and the added value arising from the projects between several partners.

The created homepage on renewable energy must reflect the development of the field in Estonia not only in Estonian, but also in English. In May 2006, the Ministers of Agriculture of the Baltic States signed a memorandum of understanding. Based on the memorandum, the Republic of Estonia Ministry of Agriculture will develop, maintain and update an online (web-based) database on renewable energy. The Republic of Latvia Ministry of Agriculture will organise an international conference on renewable energy in spring 2007, while the Republic of Lithuania Ministry of Agriculture organised a symposium on the situation of research in the area of renewable energy in the Baltic States in October 2006. One of the goals of Estonian research is to integrate into the international research system and apply positive research results quickly in practice, thus increasing the competitiveness of the economy. International cooperation on bioenergy also has an important part in this.

International cooperation must supply researchers, officials and entrepreneurs with the necessary information and synergy arising from cooperation.

Mobilisation of new biomass sources

In the case of agricultural parcels eligible for support from the ARIB 286 000 ha account for land in respect of which no applications for support have been submitted, i.e. provisionally unused land, of which 123 000 ha form completely unused parcels. Taking into account the size of the area of unused arable land, the use of degraded land for mobilisation of new biomass sources has not been discussed. Agricultural land located outside the ARIB parcels accounts for approximately 147 000 hectares. An overwhelming majority of these areas are of a very small size, often natural grasslands overgrown with bushes and therefore only a small part of the land is suitable for effective cultivation of energy crops. However, at the moment an important reserve for cultivating energy crops and increasing biomass production has been covered by applications for support in the form of an extremely extensively managed agricultural land.

In 2007, approximately 840 000 hectares of agricultural land were covered with applications for the single area payment, but in some areas the land is maintained (cut) only for the purpose of support and the biomass production is left unused.

In Estonia approximately 2 million tons of manure with an energetic value of 400 GWh are generated per year. If to consider that one-half of it could be used to produce biogas, this would form approximately 200 GWh of primary energy.

The general objective of the DPB is to create favourable conditions for the development of domestic biomass and bioenergy production in order to reduce the dependence of Estonia on imported resources and fossil fuels, to decrease the pressure on the natural environment, to use the land resources efficiently and sustainably and to enhance employment in rural areas. For the production and use of biomass the DPB has established the following target levels:

Indicator	Explanation	Initial level	Target level and year
Greenhouse gas emissions from agriculture	CO ₂ eq Gg (Source: Eurostat)	1 291.74 (2006)	702 (2013)
Use of bioenergy	TJ (Source: Environment Information Centre)	9 860 (2005)	x ¹ (2013)
Arable land used	Arable land receiving single area payments (Source: ARIB)	844 000 ha (2006)	877 000 ha (2013)
Area under energy crops	Arable land receiving support for energy crops (Source: Statistics Estonia)	0 ha (2006)	100 000 ha (2013)
Share of power produced in biomass-based combined regime in domestic power consumption		0.2% (2005)	3% (2013)
Share of district heat produced from renewable resources in total district heat		21% (2005)	33% (2013)
Share of biofuels in consumption	Transport (Source: Tax and Customs Board)	0% (2006)	6% (2013)

¹ Will be specified based on the analyses of 2007 (biogas and biofuels will be added to the present use of wood fuels)

In order to achieve the objective of mobilisation of new biomass sources and better use of the existing sources, the activities are implemented through three subordinate objectives.

The main objectives of the DPB include the following:

DPB OBJECTIVE 1

To ensure the R&D necessary for promoting the use of biomass and bioenergy

Indicators:

1. The surveys and analyses required for implementing the development plan have been commissioned.
2. The R&D concerning biomass and bioenergy and the situation of studies have been analysed and the necessary proposals have been made for implementing the measures.
3. The statistical data sheets have been filled in and the relevant statistics have been collected, price information will be available for those interested on the homepage.

The objective will be achieved through taking the following measures and actions:

DPB Measure 1

R&D for establishing the infrastructure needed for promoting the use of biomass and bioenergy, for innovation and the transfer of technology and know-how

Actions

The following surveys will be commissioned for implementing the development plan:

- assessment of the land resource;
- assessment of biomass resource (physical and economic availability of various types of biomass);
- surveys of energy crops (agricultural technology, varieties; cost-effectiveness);
- technology studies and possibilities for use (biogas, combustion, combined production, fuel production, production of materials, assessment of the lifecycle of biomass products);
- transport biofuel types that are cost-effective in Estonia and the preconditions necessary for their introduction;
- analysis of the market regulation in the field (law, charges, public procurement, support).

DPB Measure 2

Creation of preconditions for international and interdisciplinary R&D towards the promotion of the use of biomass and bioenergy

Actions

- analysis of the R&D and the situation of studies in the field of biomass and bioenergy (in research areas involving the use of biomass and bioenergy, including energy production and electrical engineering as well as crop husbandry, land improvement, plant production)
- depending on the possible need for specialists, development of a sectoral curriculum or provision of opportunities for training top specialists in foreign universities
- the creation of infrastructure needed for sectoral research, development and training is supported within the framework of upgrading general infrastructure
- targeted scholarships are used to motivate young people to study abroad and to support their research at home.

DPB Measure 3

Planning the need for data, collection of data, analysis and publication

Actions

- supplementation of the statistical data sheet depending on the statistics necessary;
- collection and publication of biomass and bioenergy prices.

DPB OBJECTIVE 2

To increase the awareness of consumers, investors, entrepreneurs and policymakers regulating the market

Indicators:

1. The homepage has been created, the information is available, entrepreneurs are recognised, the awareness of entrepreneurs and consumers has increased.
2. Cooperation is in progress, as a result of which the approved joint projects will be implemented, which will improve the awareness of entrepreneurs and policymakers for the efficient implementation of effective policies.

The objective will be achieved through taking the following measures and actions:

DPB Measure 4

Actions

Information provision activities
<ul style="list-style-type: none"> - exhibitions, seminars, conferences and study trips, counselling activities and in-service training will be organised - field information will be collected, developed and published on a regular basis on a separate homepage, which is administered by the RDF. The service must include mediation of international information. In addition, publications, articles and broadcasts will be compiled for publishing - undertakings having a positive effect on the development of the market will be recognised each year.

DPB Measure 5

Actions

International cooperation
<ul style="list-style-type: none"> - Participation in international projects and events - Participation in international cooperation. Cooperation on the level of ministries and administrative agencies – NB8, Basrec, Baltic21, etc.

DPB OBJECTIVE 3

To ensure the implementation of instruments required for market organisation

Indicators:

1. An EVS technical committee of bioenergy and biomass has been created and operates; the standards have been published in the official bulletin *EVS Teataja*.
2. The impact of charges has been analysed and if necessary planned, and proposals have been made for amending legislation.
3. The impact of support has been analysed, additional need for support has been planned and implemented, if necessary, within the limits of the allocated budget resources.
4. The possibilities of public procurement have been analysed, public procurement is used to motivate biomass and bioenergy consumption.
5. The impact of setting possible obligatory proportions has been analysed and proposals have been made for implementing the measure.

The objective will be achieved through taking the following measures and actions:

DPB Measure 6

Standardisation

Actions	- The EVS Technical Committee for Biomass and Bioenergy will be established at the Estonian Centre for Standardisation. The task of the Committee is to participate in the European standardisation process and to organise the transposition of required standards.
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DPB Measure 7

Actions

Fiscal instruments	
	- the impact of the existing measures on the development of the field will be analysed along with the support measures of other countries, and the necessary supplementary measures will be taken in due course, if necessary

DPB Measure 8

Actions

Public procurement for biomass, consumption technologies and bioenergy	
	- Suitable measures will be taken, depending on the analysis of public procurement. When analysing the possibilities for contributing to the extension of biomass use by the state and local governments, issues concerning the energy efficiency requirements for public procurement must be assessed along with the impact of the mandatory use of renewable energy by the state and local governments and the imposition of the potential obligation to acquire vehicles consuming biofuels.

DPB Measure 9

Actions

Imposition of obligations	
	- The impact of imposing the mandatory proportion of transport biofuels on the fuel market will be analysed and relevant measures will be developed. When analysing the possibilities of using biomass as raw material for transport fuels, the impact of the imposition of the requirement for the mandatory proportion of marketing transport biofuels on the fuel market must be analysed together with the impact of the imposition of the possible mandatory obligation to use biofuels on public transport companies and large transport companies.

– Impact on other sectors

In intensifying the use of forest resources a seasonal rise in prices has been observed in undertakings processing wood. However, as a positive side effect the number of jobs in the biomass supply sector has increased, due to which several local authorities have started the transfer of local boiler plants to local bioresources. More extensive use of local fuel also contributes to an increased energy security and independence of imported fuel and helps thus also improve the foreign trade balance of Estonia.

According to surveys, cultivation of monocultures may reduce natural biodiversity.

4.7 Planned use of statistical transfers between Member States and planned participation in joint projects with other Member States and third countries

The forecast document referred to in Article 4(3) of Directive 2009/28/EC has been presented to the European Commission by the term set out in the Directive. During drawing up this Action Plan the forecast data has been specified and presented in Table 9. According to the data presented in the Table, the excess of Estonia compared to the indicative trajectory varies in terms of years 31–131 ktoe.

4.7.1 Procedural aspects

As no procedural acts for arranging a statistical transfer or joint project of renewable energy have been set out by separate legislation, the relevant communication with Member States or third countries is regulated by the Foreign Relations Act. Issues related to the energy sector have been placed within the competence of the Ministry of Economic Affairs and Communications, which arranges relevant activities in Estonia. More detailed procedural aspects will be reviewed when harmonising the legislation of Estonia with Directive 2009/28/EC.

The aforementioned procedures and criteria for determining when statistical transfers or joint projects are used will be established after the relevant additional information has been analysed or the instructions have been received from the European Commission.

4.7.2 Estimated excess production of renewable energy compared to the indicative trajectory which could be transferred to other Member States

Relevant information has been presented in Table 9.

4.7.3 Estimated potential for joint projects

An enormous potential for developing renewable energy use in the territory of Estonia for the purpose of joint projects is the development of offshore wind power. Thus far, the main hindrances in the development of the sector have been limited possibilities of power networks and the scarcity of compensating capacities.

Although the use of biomass for the production of heat and electricity has been developed since the 1990s, there is still unused potential in this sector.

Taking into account the excess that arises, Estonia has not yet considered the potential for joint projects in other Member States or third countries, but it may do that in the future based on the economic aspects of achieving the renewable energy objectives.

4.7.4 Estimated demand for renewable energy to be satisfied by means other than domestic production

The required information has been presented in Table 9.

Table 9. Estimated excess and/or deficit production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States in Estonia

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimated excess in forecast document	-	47	69	78	96	79	88	52	67	-	3
Estimated excess in NREAP	-	50	85	97	109	74	83	49	69	79	-1
Estimated deficit in forecast document	-	-	-	-	-	-	-	-	-	-	-
Estimated deficit in NREAP	-	-	-	-	-	-	-	-	-	-	-

5 ASSESSMENTS

5.1 Total contribution expected of different renewable energy technologies

The total contribution expected of each renewable energy technology to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity, heating and cooling and transport has been presented in tables 10a, 10b, 11 and 12.

The expected data presented in the tables has been found based on conservative assumptions and the estimates do not reflect the results of surveys conducted to find the potential of the resources of relevant sectors. Therefore, several areas of marginal importance, such as the introduction of biogas, solar energy, heat pumps, etc., have not been taken into account. For these fields, the cells in the tables have not been filled in.

Table 10a. Estimation of total contribution (installed capacity, gross electricity generation) expected from each renewable energy technology in Estonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity 2010–2014

	2005		2010		2011		2012		2013		2014	
	MW	GWh										
Hydro:	5.4	20.1	7.2	26.0	7.8	30.0	7.8	30.0	7.8	30.0	7.8	30.0
< 1MW	4.2	14.1	6.0	20.0	6.6	24.0	6.6	24.0	6.6	24.0	6.6	24.0
1MW–10 MW	1.2	6.0	1.2	6.0	1.2	6.0	1.2	6.0	1.2	6.0	1.2	6.0
> 10MW	-	-	-	-	-	-	-	-	-	-	-	-
Of which pumping	-	-	-	-	-	-	-	-	-	-	-	-
Geothermal	-	-	-	-	-	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-	-	-	-	-	-
Tide, wave, ocean	-	-	-	-	-	-	-	-	-	-	-	-
Wind:	31	54	147	337	178	355	311	432	350	757	400	855
onshore	31	54	147	337	178	355	311	432	350	757	400	855
offshore	-	-	-	-	-	-	-	-	-	-	-	-
Biomass:		33		241		307		336		336		336
solid												
biogas												
bioliquids ²⁹	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL												
of which in CHP		33		241		307		336		336		336

²⁹ Take into account only those complying with the sustainability criteria (cf. Article 5(1) of Directive 2009/28/EC last subparagraph).

Table 10b. Estimation of total contribution (installed capacity, gross electricity generation) expected from each renewable energy technology in Estonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity 2015–2020

	2015		2016		2017		2018		2019		2020	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
Hydro:	7.8	30.0	7.8	30.0	7.8	30.0	7.8	30.0	7.8	30.0	7.8	30.0
< 1MW	6.6	24.0	6.6	24.0	6.6	24.0	6.6	24.0	6.6	24.0	6.6	24.0
1MW–10 MW	1.2	6.0	1.2	6.0	1.2	6.0	1.2	6.0	1.2	6.0	1.2	6.0
> 10MW	-	-	-	-	-	-	-	-	-	-	-	-
Of which pumping	-	-	-	-	300		300		300		300	
Geothermal	-	-	-	-	-	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-	-	-	-	-	-
Tide, wave, ocean	-	-	-	-	-	-	-	-	-	-	-	-
Wind:	400	981	500	974	550	1 209	550	1 320	650	1 320	650³⁰	1 537
Onshore	400	981	400	974	400	974	400	974	400	974	400	974
Offshore	-	-	100	-	150	235	150	346	250	346	250	563
Biomass:		346		346		346		346		346		346
solid												
biogas												
bioliquids ³¹	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL												
of which in CHP		346		346		346		346		346		346

³⁰ In accordance with the National Development Plan of the Energy Sector until 2020 up to 900 MW.

³¹ See footnote 24.

Table 11. Estimation of total contribution (final energy consumption³², ktoe) expected from each renewable energy technology in Estonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling 2010–2020

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Geothermal (excluding low temperature geothermal heat in heat pump applications)	-	-	-	-	-	-	-	-	-	-	-	-
<i>Solar</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Biomass:</i>												
solid	505	612	622	626	626	626	626	623	619	615	611	607
biogas												
<i>bioliquids</i> ³³	-	-	-	-	-	-	-	-	-	-	-	-
Renewable energy from heat pumps												
TOTAL	505	612	622	626	626	626	626	623	619	615	611	607
<i>Of which DH</i> ³⁴	195	214	228	235	240	244	248	248	248	248	248	248
<i>Of which biomass in households</i> ³⁵	58%	61%	60%	59%	58%	57%	57%	56%	56%	56%	55%	55%

³² Direct use and district heat as defined in Article 5(5) of Directive 2009/28/EC.

³³ Take into account only those complying with the sustainability criteria (cf. Article 5(1) last subparagraph of Directive 2009/28/EC).

³⁴ District heating and/or cooling from total renewable heating and cooling consumption (RES-DH).

³⁵ From the total renewable heating and cooling consumption.

Table 12. Estimation of total contribution (ktoe) expected from each renewable energy technology in Estonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector 2010–2020³⁶

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bioethanol/bio-ETBE	0	0	0	5.6	8.4	10.0	14.0	18.0	23.0	29.0	34.0	38.0
Biodiesel	0	0.9	6.9	8.2	11.3	16.7	20.5	26.4	32.3	38.1	44.1	51.1
Hydrogen from renewables	0	-	-	-	-	-	-	-	-	-	-	-
Renewable electricity	0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.6
Others (as biogas, vegetable oils, etc.) – please specify	0	0	0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
TOTAL	0	1	7	14	20	27	35	45	56	68	79	90

³⁶ For biofuels take into account only those compliant with the sustainability criteria (cf. Article 5(1) last subparagraph).

5.2 Total contribution expected from energy efficiency and energy saving measures to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity, heating and cooling and transport.

The answer to this requirement has been included in Table 1 under chapter 1.

5.3 Assessment of the impacts (Optional)

The implementation of the activities listed in the Action Plan will reduce the quantities of greenhouse gas emissions and contribute thus to the compliance with the objectives assumed by the EU and Estonia and obligations related to the Renewable Energy Directive 2009/28/EC.

The implementation of the measures described in the Renewable Energy Action Plan will reduce the dependence of Estonia on imported fossil fuels and improve thus the foreign trade balance of Estonia.

More extensive use of biofuels will create new jobs and improve thus employment, especially in rural areas by providing conditions for a sustainable regional development of rural areas.

5.4 Preparation of the National Renewable Energy Action Plan and the follow-up of its implementation

This Action Plan was prepared using the objectives and actions specified in the National Development Plan of the Energy Sector up to 2020, the Development Plan of the Estonian Electricity Sector until 2018 and the Development Plan for Enhancing the Use of Biomass and Bioenergy for the Period 2007 to 2013.

The preparation also involved the consultation with representative organisations of interest groups and mapping their proposals for measures. For the public discussion open to all persons, three seminars were organised which involved the introduction of completed interim stages and the discussion of the completed results. The topics of the public seminars were as follows:

1. Energy consumption forecast for the period 2010 to 2020 and objectives of renewable energy for 2020;
2. Measures for achieving the objectives of renewable energy;
3. Results of the Renewable Energy Action Plan.

The final version of the Action Plan is available for comments on the website of the Ministry of Economic Affairs and Communications at <http://www.mkm.ee/nreap-2/>.

The forecast total contribution of each sector to meet the binding 2020 targets and the indicative interim trajectory will be observed annually. If the indicative trajectory is not met during two consecutive years, the amendment of the Action Plan will be initiated, during which the efficiency of the measures of the Action Plan will be assessed and, if necessary, the measures will be supplemented or amended.

An implementation plan of the Action Plan will be prepared for four years and updated along with the assessment of the results of the implementation plan. An implementation plan that is updated every four years allows the specification of actions set out in the Action Plan and focus on sectoral fields the development of which has not proved to be sufficient to achieve the indicative trajectory.

The assessment and amendment of the Action Plan will be organised by the Ministry of Economic Affairs and Communications involving other relevant authorities and consulting with representative organisations of interest groups and most important infrastructure managers as and when necessary. Compliance with the Action Plan will be assessed along and preparations will be made reporting of the National Development Plan of the Energy Sector up to 2020 and the main indicator values will be published in the Report of the National Development Plan of the Energy Sector up to 2020.