

# Estonia

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## 1. SUMMARY

Estonia has ratified the Kyoto Protocol on 14 October 2002 with the commitment to reduce its GHG emissions by 8% as compared to the base year emission level. As its base year Estonia has chosen the year 1990 for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, and the year 1995 for the F-gases.

The level of the Estonian's base year emissions is provided in the Estonian's Initial Report, checked and accepted by the Compliance Committee, and equals 42.622 Mt CO<sub>2</sub> eq. This means that the Assigned Amount for Estonia for the first commitment period equals 196.065 Mt CO<sub>2</sub> eq. altogether, or 39.213 Mt CO<sub>2</sub> eq. on average annually.

Estonia became a member state of the European Union on 1 May 2004. Pursuant to the Article 3(2) of the European Parliament and Council Decision No 280/2004/EC concerning a mechanism for monitoring Community GHG emissions and for implementing the Kyoto Protocol, Estonia has submitted its projections of GHG emissions by sources and withdrawals by sinks in March 2007. This allowed drawing preliminary conclusions whether Estonia will be in compliance with its Kyoto target.

Estonia has prepared the projections for three sectors (energy, forestry and agriculture), and for three gases (CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O). They are prepared for WOM, WEM, and WAM scenarios. For the energy sector there are two WAM scenarios based on underlying energy consumption. In the other sectors (agriculture and forestry) the underlying assumptions are presented with fewer details also for three scenarios.

Several sectors and gases are left out from the projections; therefore, it is possible to make conclusions about the country's compliance only judging by the indirect figures. The emissions from three considered sectors constitute more than 70% of all emissions in the country since 1990 according to the latest Inventory submission. In 2010 the emissions from these sectors are estimated to constitute 37.2% as compared to the base-year under WEM scenario, and 34.3% under WAM scenario. It is clear, that under any scenario the Estonian GHG emissions will not surpass the Assigned Amount both due to the de-coupling of the GDP growth from the GHG emission growth and significant GDP decline in the beginning of transition period. Currently Estonia is preparing the updated projections where all the sectors and all the gases will be taken into consideration.

Policies and measures significantly contribute towards the de-coupling of the GDP growth from the GHG emissions growth. The main driving factors for GHG reduction are the improvement of conversion efficiency of fossil technologies, increase in the share of CHP and renewables, reduction of grid losses of heat and electricity, energy conservation and energy efficiency measures, expansion of the forest area.

Estonia participates already in Joint Implementation mechanism as a host party. The country has acquired full eligibility to participate in the flexible mechanisms, established the framework for the procedure of the national approval, and made a JI reserve in the Second NAP. The country does not plan to use the flexible mechanisms under the Kyoto Protocol for compliance purposes.

## 2. GHG PROJECTIONS AND PROGRESS TO KYOTO TARGETS

Estonia has prepared the GHG projections for three sectors (energy, forestry and agriculture), and three gases (CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O).

The projections in the energy sector are the most detailed ones. They are prepared for WOM, WEM, and WAM scenarios under different energy consumption assumptions. The underlying assumptions of the projections of energy consumption and production are fully presented in details in the MMS. Sensitivity analysis has been done for energy sector development regarding the fluctuations of the international coal and gas prices.

In the other sectors (agriculture and forestry) the underlying assumptions are presented in fewer details for WEM and WAM scenarios. Other sectors are not presented in the projections. The projections of the F-gases have not been prepared.

Despite the missing sectors and gases, it is clear that Estonia will easily comply with its Kyoto target (39.213 Mt CO<sub>2</sub> eq. per year on average). The projected emissions excluding LULUCF are estimated to constitute 37.2 % as compared to the base year in 2010 under WEM scenario. Taking into account the expected GHG withdrawals by sinks, namely 7.7 Mt CO<sub>2</sub> eq. in the year 2010 under the WEM scenario, achieving the compliance of the country with the Kyoto target is even easier.

The main difference between the WOM, WEM and WAM scenarios lays in the assumptions for the development of the energy sector. The scenarios differ by the extent of the use of co-generation, renewables, and natural gas instead of other fossil fuels in the energy production sector and extent of implementation of the energy efficiency measures in the energy consumption sector. In the forestry sector the enhancement of sinks due to the expanded forest area under WEM scenario is complemented by the implementation of the sustainable forest management principles under WAM scenario. In the agricultural sectors the difference between WEM and WAM projections are based on the different numbers of animals and different use of fertilisers.

Though Estonia participates in a number of JI projects as a host party, the country does not intend to use the flexible mechanisms under the Kyoto Protocol for compliance purposes.

The following Table 1 shows, for all gases and main sectors:

- GHG emission projections for the two scenarios “with existing measures” (WEM) and “with additional measures” (WAM), as reported by Estonia;

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- Historic emissions (in the “reference year”) as reported together with projections.

For Estonia, the reference year is the year 2000.

**Table 1. Summary of reported projections by sector and by gas in 2010 (Mt CO<sub>2</sub>-eq.)**

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF <sub>6</sub> , HFCs and PFCs)			Total		
	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM
<b>Energy (incl. transport)</b>	17.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16.2	15.4
<b>Energy excl. transport)</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Energy supply	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Energy – industry, construction	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Energy – other (commercial, residential, agriculture)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Transport (energy)</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Industrial processes</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.3	0.3
<b>Waste</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1	0.7
<b>Agriculture</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.4	1
<b>Other</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Total (excl. LULUCF)</b>	17.5	15.8	15.2	NE	2.5	1.8	NE	0.5	0.4	NE	NE	NE	NE	18.9	17.4

**Key:**

Reference year: 2000

WEM: ‘with existing measures’ projection

WAM: ‘with additional measures’ projection

**Source:** Estonia’s MM submission, March 2007

The following Table 2 shows, for all gases and main sectors:

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- 1990 GHG emissions as reported in the latest (2008) GHG emissions inventory (1990-2006);
- Adjusted GHG emission projections for the WEM and WAM scenarios. This adjustment of the projections reported in Table 1 is carried out to allow consistency and comparability between projections and the latest (2008) GHG inventory data<sup>1</sup>.

The adjustments are calculated according to the following formula: Projections in this table should be calculated as follows = Table 1 projections \* Correction Factor. Correction Factor = latest inventory emissions for the same reference year / Table 1 reported reference year emissions.

While searching for comparable data to calculate the correction factor, only one set of data has been found. These are the CO<sub>2</sub> emissions from the energy sector. For the projections consistent reference year this indicator is provided in the MMS 2007 submission constituting around 17.5 Mt CO<sub>2</sub>. It is not clear whether it includes or excludes transport. However, since the projections are estimated based on the projected total fuel consumption within the country, the assumption is that transport is included. The latest inventories of the same year (2000) estimate total CO<sub>2</sub> emission in the energy sector including transport as 14.697 Mt CO<sub>2</sub>, thus the correction factor is 0.84.

**Table 2. Summary of projections by sector and by gas in 2010 compared to 1990 emissions (MtCO<sub>2</sub>eq)**

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF <sub>6</sub> , HFCs and PFCs)			Total		
	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM
<b>Energy( incl. transport)</b>	35.4	NE	NE	1.3	NE	NE	0.05	NE	NE	NE	NE	NE	36.7	13.6	12.9
<b>Energy (excl. transport)</b>	32.1	NE	NE	1.3	NE	NE	0.1	NE	NE	NE	NE	NE	33.4	NE	NE
Energy supply	28.8	NE	NE	1.2	NE	NE	0.0	NE	NE	NE	NE	NE	30.0	NE	NE
Energy – industry, construction	1.7	NE	NE	0.0	NE	NE	0.0	NE	NE	NE	NE	NE	1.8	NE	NE
Energy – other (commercial, residential, agriculture)	1.5	NE	NE	0.1	NE	NE	0.0	NE	NE	NE	NE	NE	1.6	NE	NE
<b>Transport (energy)</b>	3.4	NE	NE	0.0	NE	NE	0.0	NE	NE	NE	NE	NE	3.4	NE	NE

<sup>1</sup> The adjustment consists in applying an adjustment factor to projections from Table 1. This factor is the ratio between total emissions in the reference year as reported in the 2008 GHG inventory report (or, if the reference year is the base-year under the Kyoto Protocol, in the report of the review of the initial report under the Kyoto Protocol) and total emissions in the reference year as reported by the country with projections (Table 1).

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<b>Industrial processes</b>	0.9	NE	NE		NE	NE		NE	NE	NE	NE	NE	0.9	0.3	0.3
<b>Waste</b>	NE	NE	NE	0.6	NE	NE	0.1	NE	NE	NE	NE	NE	0.7	0.8	0.6
<b>Agriculture</b>	NE	NE	NE	1.3	NE	NE	1.9	NE	NE	NE	NE	NE	3.2	1.2	0.8
<b>Other</b>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Total (excl. LULUCF)</b>	<b>36.4</b>	<b>13.3</b>	<b>12.8</b>	<b>3.6</b>	<b>2.1</b>	<b>1.5</b>	<b>2.1</b>	<b>0.4</b>	<b>0.3</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>41.6</b>	<b>15.9</b>	<b>14.6</b>

### Key:

WEM: 'with existing measures' projection

WAM: 'with additional measures' projection

**Source:** Estonia's MM submission, March 2007 and Annual greenhouse gas inventory 1990 – 2006, April 2008.

**Table 3: Summary of projections by sector and by gas in 2010 compared to 1990 emissions (index 100 = 1990)**

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF6, HFCs and PFCs)			Total		
	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM
<b>Energy</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	37.0	35.1
<b>Energy (excl. transport)</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE
Energy supply	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE
Energy – industry, construction	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE
Energy – other (commercial, residential, agriculture)	100.0	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE
<b>Transport (energy)</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE
<b>Industrial processes</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	26.6	26.6
<b>Waste</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	123.7	86.6
<b>Agriculture</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	36.5	26.0
<b>Other</b>	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE	100	NE	NE
<b>Total (excl. LULUCF)</b>	<b>100</b>	<b>36.5</b>	<b>35.1</b>	<b>100</b>	<b>65.9</b>	<b>47.4</b>	<b>100</b>	<b>20.5</b>	<b>16.4</b>	<b>100</b>	<b>NE</b>	<b>NE</b>	<b>100</b>	<b>38.1</b>	<b>35.1</b>

### Key:

WEM: 'with existing measures' projection

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WAM: 'with additional measures' projection

**Source:** Estonia's MM submission, March 2007 and Annual greenhouse gas inventory 1990 – 2006, April 2008.

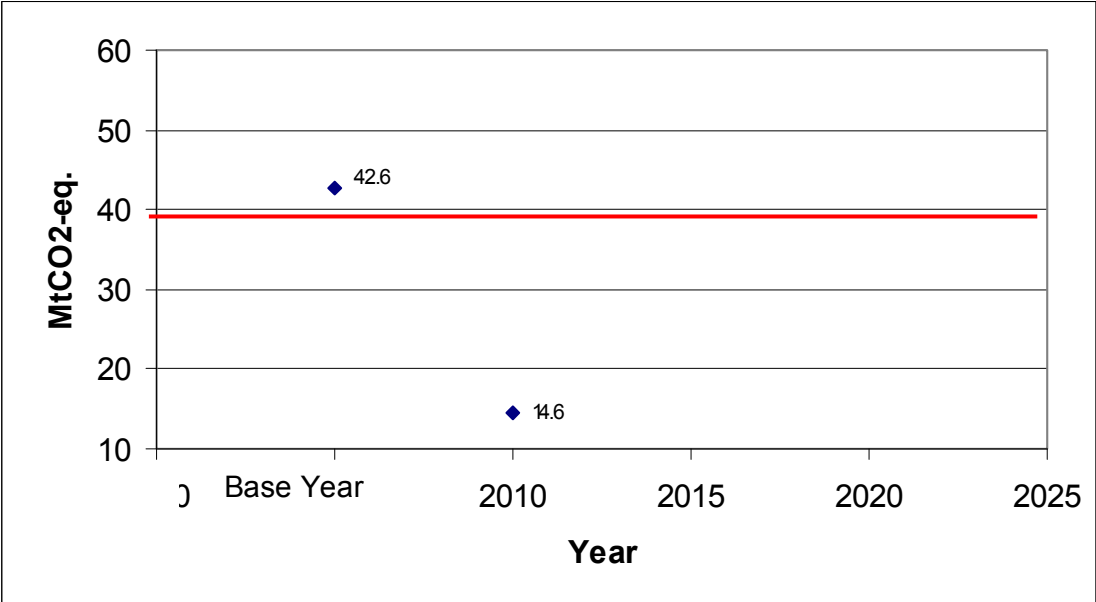
**Table 4: Summary of projections in 2010 compared to base year emissions under the Kyoto Protocol**

	Unit	Base-year emissions under the Kyoto Protocol	2010 projections 'with existing measures'	2010 projections 'with additional measures'
Total GHG emissions (excluding LULUCF)	Mt CO <sub>2</sub> -eq.	42.6	15.9	14.6
	Index (base-year emissions = 100)	100	37.2	34.3

**Source:** Estonia's MM submission, March 2007 and Annual greenhouse gas inventory 1990 – 2006, April 2008.

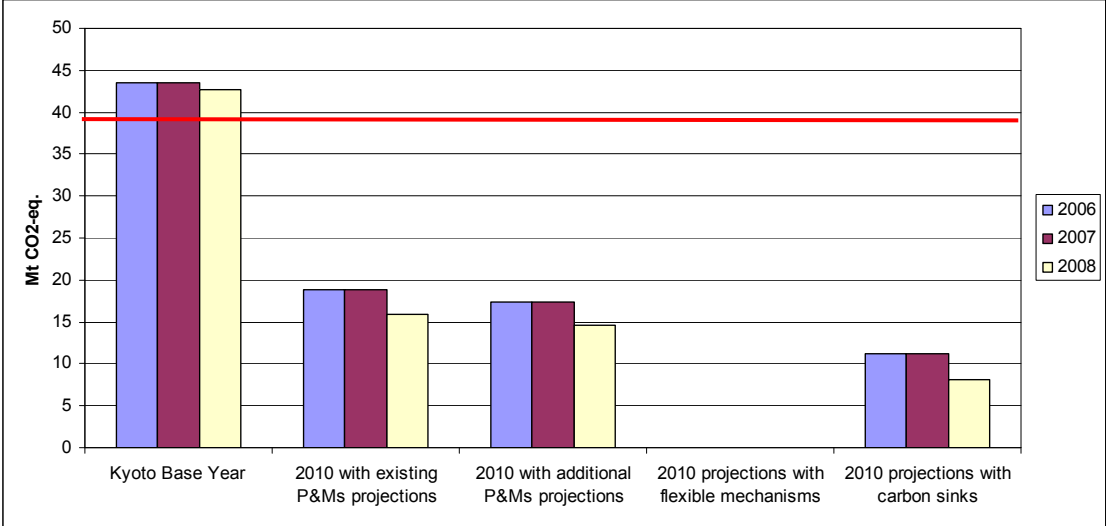
**Figure 1. Greenhouse gas projections in 2010, 2015 and 2020 (Mt CO<sub>2</sub>-eq.)**

In Figure 1, the same correction factor (0.84) used in Table 2 has been applied to the projections for 2010 data..



Source: Estonia’s MM submission, March 2007.

**Figure 2 Comparison of 2010 projections reported in 2006, 2007 and 2008**



Source: Estonia’s MM submission, March 2007.



### 3. CLIMATE CHANGE MITIGATION POLICIES AND MEASURES

Despite the fact that Estonia will comply with its Kyoto target, the country implements the policies and measures leading towards the reductions of GHG emissions and enhancement of CO<sub>2</sub> withdrawals.

In the below Table 5, the data are provided on the effect of PaMs on the GHG emissions. In the columns related to the bottom-up approach this effect is calculated on the national scale. For estimating the effects of the existing measures the projected GHG in 2010 under WEM scenario are deducted from the projected GHG emission level under WOM scenario. For estimating the effect of the planned measures on the national level the projected emissions under WAM scenario are subtracted from the level of projected emissions under WEM scenario.

For bottom up calculation the effect of the individual measures (if any estimation has been done at all) for existing and planned PaMs are summed up.

From the below Table 5, Table 6 and Table 7 it becomes clear that the majority of the individual PaMs are either undertaken or planned in the energy supply and energy consumption sectors. These PaMs are a part of the implementation of CCPMs.

**Table 5. Summary of the effect of policies and measures included in the 2010 projections (Mt CO<sub>2</sub>-eq.)**

	Top down calculation		Bottom Up calculation	
	Existing Measures	Planned Measures	Existing Measures	Planned Measures
<b>Energy (total, excluding transport)</b>	0.0	0.8	0.09	0.1
Energy supply	NE	NE	0.06	0.099
Energy – industry, construction	NE	NE	NE	NE
Energy – other (commercial, residential, agriculture)	NE	NE	0.03	NE
<b>Transport (energy)</b>	NE	NE	0.12	0.119
<b>Industrial processes</b>	NE	NE	0.012	0.013
<b>Waste</b>	NE	0.3	NE	0.004
<b>Agriculture</b>	NE	0.4	NE	NE
<b>Cross-sectoral</b>	NE	NE	NE	NE
Total (excluding LULUCF)	NE	1.5	0.222	0.235

**Note:** The effects of measures detailed above are calculated firstly by determining the difference between total projections in each scenario ('top down calculation') and secondly by summing the reported effect of individual measures ('bottom up calculation'). A top down calculation of existing measures was not possible as required data were not provided in Estonia's MM submission.

**Source:** Estonia's MM submission, March 2007, for the top down calculation; ECCP Policies and Measures database, June 2008, for the bottom up calculation.

**Table 6. Detailed information on Existing Policies and measures**

Sector	Name	Type	GHG	Status	Absolute Reduction			Costs [EUR/t]
					[kt CO <sub>2</sub> eq. p.a.]			
					2005	2010	2020	
Cross-cutting	Estonian National Environmental Strategy	Planning	CO <sub>2</sub>					
Cross-cutting	Pollution Charge Act	Economic	CH <sub>4</sub> , CO <sub>2</sub> , HFC, N <sub>2</sub> O, PFC, SF <sub>6</sub>	Implemented				
Cross-cutting	Activities Implemented Jointly	Voluntary/negotiated agreement	CO <sub>2</sub>	Expired				
Cross-cutting	Joint Implementation	Voluntary/negotiated agreement	CO <sub>2</sub>	Implemented				
Cross-cutting	Agreement on a Testing Ground for Application of the Kyoto Mechanisms on Energy Projects in the Baltic Sea Region (RT II 2004, 22, 92)	Regulatory	CO <sub>2</sub>					
Cross-cutting	National Allocation Plan for GHG emissions Allowances	Economic	CO <sub>2</sub>					
Cross-cutting	Value Added Tax Act (RT I 2001, 64, 368)	Economic	CO <sub>2</sub>					
Energy Supply	Long-Term National Development Plan for the Fuel and Energy Sector	Regulation	CO <sub>2</sub>					
Energy Supply	Fuel Switch	Voluntary/negotiated agreement	CO <sub>2</sub>	Implemented	2	2		
Energy Supply	Renovation of District Heating Systems	Voluntary/negotiated agreement	CO <sub>2</sub>	Implemented	5	5		
Energy Supply	Renovation of Oil Shale Power Plants - Narva Plants	Regulatory	CO <sub>2</sub>	Implemented	53	53		
Energy Supply	Green Energy Project	Information	CO <sub>2</sub>	Implemented				
Energy Consumption	Renovation of DH Boilers and Boiler Plants	Voluntary/negotiated agreement	CO <sub>2</sub>	Implemented	10			

Energy Consumption	Renovation of Residential Buildings	Voluntary/negotiated agreement	CO2	Implemented	10	10	
Energy Consumption	Energy Efficiency of Equipment Act	Regulatory	CO2	Implemented	10		
Energy Consumption	District Heating Act	Regulatory	CO2	Implemented			
Energy Consumption	Replacement of Electric Appliances in Households	Voluntary/negotiated agreement	CO2	Implemented			
Transport	Quality Requirements for Liquid Fuels	Regulatory	CO2	Implemented	20		
Transport	Development Plan of the Transport Sector for 1999-2006	Regulatory	CO2	Implemented	100		
Industrial Processes	Estonian National Environment Strategy (Industry)	Regulatory	CO2	Implemented	12		
Industrial Processes	Integrated Pollution Prevention and Control Act	Regulatory	CH <sub>4</sub> , CO <sub>2</sub> , HFC, N <sub>2</sub> O, PFC, SF <sub>6</sub>	Implemented			
Industrial Processes	Environmental Management Systems	Voluntary/negotiated agreement	CH <sub>4</sub> , CO <sub>2</sub> , HFC, N <sub>2</sub> O, PFC, SF <sub>6</sub>	Implemented			
Industrial Processes	Eco-labeling	Voluntary/negotiated agreement	CH <sub>4</sub> , CO <sub>2</sub> , HFC, N <sub>2</sub> O, PFC, SF <sub>6</sub>	Implemented			
Industrial Processes	Voluntary Agreements	Voluntary/negotiated agreement	CH <sub>4</sub> , CO <sub>2</sub> , HFC, N <sub>2</sub> O, PFC, SF <sub>8</sub>	Implemented			
Industrial Processes	Voluntary Environmental Reporting	Information	CH <sub>4</sub> , CO <sub>2</sub> , HFC, N <sub>2</sub> O, PFC, SF <sub>9</sub>	Implemented			
Agriculture	Rural Development Plan	Planning	CH <sub>4</sub> CO <sub>2</sub> N <sub>2</sub> O	Implemented			

Agriculture	Organic Farming Act	Regulatory	N2O	Implemented		
Forestry	Forest Act	Regulatory	CO2	Implemented	1739	
Forestry	Restoration of Mining Areas	Regulatory	CO2	Implemented	15	
Forestry	Re-forestation of out-of-use agricultural land (approximately 100 thou ha)	Regulatory	CO2	Implemented	330	330
Waste	New Requirements for Landfills	Regulatory	CH4	Other	3	3

Source: Öko Institut, (accessed 18 June 2008), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

**Table 7. Detailed information on Planned Policies and measures**

Sector	Name	Type	GHG	Status	Absolute Reduction			Costs [EUR/t]
					[kt CO <sub>2</sub> eq. p.a.]			
					2005	2010	2020	
Cross-cutting	Estonian National Environmental Strategy	Planning	CO2					
Cross-cutting	Agreement on a Testing Ground for Application of the Kyoto Mechanisms on Energy Projects in the Baltic Sea Region (RT II 2004, 22, 92)	Regulatory	CO2					
Cross-cutting	National Allocation Plan for GHG emissions Allowances	Economic	CO2					
Cross-cutting	Value Added Tax Act (RT I 2001, 64, 368)	Economic	CO2					
Energy Supply	Long-Term National Development Plan for the Fuel and Energy Sector	Regulation	CO2					

Source: Öko Institut, (accessed 18 June 2008), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

**Table 8. Status of national policies and measures (PAM) in relation to European common and coordinated policies and measures (CCPM)**

Status	CCPM	Sector	
National policies and measures already in force <b>before</b> CCPM was adopted	Kyoto Protocol project mechanisms 2004/101/EC	Cross-cutting	
Existing national policies and measures <b>reinforced</b> by CCPM	Taxation of energy products 2003/96/EC		
	Energy performance of buildings 2002/91/EC		
	Directive on waste 2006/12/EC		
<b>New</b> national policies and measures implemented after CCPM was adopted	Emissions trading 2003/87/EC	Cross-cutting	
	Integrated pollution prevention and control 96/61/EC	Cross cutting	
	Promotion of cogeneration 2004/8/EC	Energy supply	
	Promotion of electricity from RE sources 2001/77/EC	Energy supply	
	Directives on energy labeling of appliances	Energy consumption	
	Energy labeling for office equipment 2422/2001	Energy consumption	
	Efficiency fluorescent lighting 2000/55/EC	Energy consumption	
	Efficiency of hot water boilers 92/42/EEC	Energy consumption	
	Packaging and packaging waste (94/62/EC, 2004/12/EC, 2005/20/EC)	Waste	
	Landfill directive 1999/31/EC	Waste	
	Promotion of biofuels for transport 2003/30/EC	Transport	
Status of national policy or measure <b>not reported</b>	Internal electricity market 2003/54/EC	Energy supply	
	Internal market in natural gas 98/30/EC	Energy supply	
	Ecodesign requirements for energy-using products 2005/32/EC	Energy consumption	
	End-use efficiency and energy services 2006/32/EC	Energy consumption	
	Eco-management & audit scheme (EMAS) EC 761/2001	Energy consumption	
	Motor challenge, voluntary EC programme	Energy Consumption	
	Transport modal shift to rail 2001/12/EC.	Transport	
	Consumer information on cars 1999/94/EC	Transport	
	Agreement with car manufacturers ACEA	Transport	
	Marco Polo programme on freight transport	Transport	
	Integrated European railway area (COM(2002)18 final)	Transport	
	HFCs in mobile air conditioning 2006/40/EC	Transport	
	F-gas regulation (842/2006)	Industrial Processes	
	Support under CAP (1782/2003)	Agriculture	
	Support under CAP - amendment (1783/2003)	Agriculture	
	Rural development support and CAP(2603/1999, 1698/2005 and 1290/2005)	Agriculture	
	Support scheme for energy crops under CAP (795/2004)	Agriculture	

	Support for rural development from EAGGF (1257/1999)	Agriculture
	Pre-accession measures for agriculture and rural development (1268/1999)	
	Nitrates directive 91/676/EEC	

**Source:** MS responses to the CCPMs questionnaire, 2005. Personal communications.

## 4. METADATA

### Sources of information

Estonia's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Report submitted 2 June 2008.

Estonia's Annual greenhouse gas inventory 1990 - 2006 and inventory report, 7 April 2008.

Base-year emissions from the UNFCCC website,  
[http://unfccc.int/ghg\\_data/kp\\_data\\_unfccc/base\\_year\\_data/items/4354.php](http://unfccc.int/ghg_data/kp_data_unfccc/base_year_data/items/4354.php)

Öko Institut, (accessed 24/06/2008), ECCP Policies and Measures database,  
<http://www.oeko.de/service/pam/index.php>

Estonia's Fourth National Communication under the United Nations Framework Convention on Climate Change, Ministry of Environment of Estonia, 2005 (hereinafter 4<sup>th</sup> NC)

### Kyoto base-year emissions

Kyoto base-year emissions are presented throughout, except Table 1 which presents projections reference year emissions (see below). Kyoto base year emissions of greenhouse gases (42.62 Mt CO<sub>2</sub> eq.) were calculated using 1990 emissions for carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and 1995 emission calculations for F-gases.

Kyoto base-year emissions have now been reviewed and set for all EEA countries, including Estonia.

### Projections reference year emissions

Projections reference year emissions are presented in Table 1.

Projections reference year emissions are defined as projections-consistent emissions data for a given historic year, as chosen by the Member State. For Estonia it is the year 2000. Inventory recalculations from year to year may mean that latest inventory data cannot be compared with projections based on older inventory data. Where such an inconsistency has arisen, MS projections have been corrected by applying the following formula:

Corrected projection = projections reported by MS \* reference year emissions reported by MS alongside projections / latest inventory emissions for the same reference year. In Estonian case while searching for comparable data to calculate the correction factor, only one set of data has been found. These are the CO<sub>2</sub> emissions from the energy sector. For the projections consistent reference year this indicator is provided in the MMS 2007 submission constituting around 17.5 Mt CO<sub>2</sub> (see Figure 2.3.1. in the MMS 2007 submission, page 16). This is not clear whether it includes or excludes transport. However, since the projections are estimated based on the projected total fuel consumption within the country, the assumption is that transport is included. The latest inventories of the same year (2000) estimate total CO<sub>2</sub> emission in the energy sector including transport as 14.697 Mt CO<sub>2</sub>, thus the correction factor is 0.84.

### Quality of Reporting

Member State reporting in the sources detailed above was assessed semi-qualitatively. Scoring was attributed according to the level of detail and clarity: from 0 (representing no reported) to +++ (representing very detailed and/or clear reporting). Guidance used for this assessment included the reporting requirements laid down in:

- EU legislation: Monitoring Mechanism (280/2004/EC) and Implementing Provisions (2005/166/EC)
- UNFCCC reporting guidelines for national communications available in English, French, Spanish (“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications - FCCC/CP/1999/7”)

The following tables detail reporting considered to be best practice for the purposes of this assessment.

Information provided	Example of good practice
Policy names	Clear names and description provided with unique identifier.
Objectives of policies	Good description of objectives
Types of policies	Type of policy instrument specified e.g. regulatory, fiscal
Which greenhouse gases?	Specifies which gases each PAM affects
Status of Implementation	Clear for each PAM: planned, adopted, implemented, expired
Implementation body	Clear which authorities are responsible for implementation
Quantitative assessment of emission reduction effect and cost of policies	Almost all PAMs are actually quantified. Total effect of all PAMs specified. WOM projection provided.
Interaction with other national and EU level policies	Detailed discussion and analysis of policy interactions.
Measures implementing community legislation	Report details which national policies are implementing individual pieces of EU legislation.
Arrangements for flexible mechanisms	Details arrangements for use of flexible mechanisms.
Balance between domestic action and flexible mechanisms	Regarding reductions required to meet Kyoto target, details proportion to result from domestic action and flexible mechanisms.

Category of Information	Example of good practice
WEM and WAM projections	"with measures" and "with additional measures" projections required. "without measures projection" optional.
Policies included in each projection	Clear presentation of the policies included in each projections scenario.
Expressed relative to historic reference year data	Projections are presented alongside consistent historic emissions.
Starting year	Starting year and emissions used as basis for projections is detailed.
Split of projections	Projection split by all 6 gases (or F-gases together), all sectors and years
Presentation of results	Clear, both tables and graphs provided and/or used excel reporting template.
Description of methodologies	Description of approach, model and assumptions
Sensitivity analysis	Was an analysis carried out to determine the sensitivity of projections to variance in the input parameters? Are high medium and low scenarios presented?
Discussion of uncertainty	Is an uncertainty range for the projections provided?
Details of parameters and assumptions	Are parameters as required under Monitoring Mechanism 280/2004/EC reported?
Indicators for projections	Are indicators for projections as required under Monitoring Mechanism 280/2004/EC reported?

**Table 9. Information provided on policies and Kyoto flexible mechanisms**

Information provided	Level of information provided	Comments
Policy names	+++	Policy names are provided.
Objectives of policies	+++	Objectives of almost every policy or measure are specified in the text.
Types of policies	+++	Indicated
Which greenhouse gases?	++	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O. No information on the fluorinated gases.
Status of Implementation	++	It is indicated whether a policy is planned, implemented or expired. No information on which scenario WEM or WAD the policy belongs to.
Implementation body	+	Implementation bodies are specified in a general way. For instance, "national government". No information which body of the national government is responsible for the implementation.
Quantitative assessment of emission reduction effect and cost of policies	++	Quantitative assessment is provided. No information on the methodology of calculations.
Interaction with other national and EU level policies	+++	Detailed discussion and analysis of policy interactions.
Measures implementing community legislation	++	Community CCPM has been gradually transposed in the Estonian legislation, and is now under implementation.



Arrangements for flexible mechanisms	+++	Estonia has acquired full eligibility, established a DNA, and approved national approval procedure.
Balance between domestic action and flexible mechanisms	+++	Estonia will not be an Investor into Flexible Mechanism for the first commitment period. It will host JI projects for the sake of implementation of national priorities.

Source: Estonia's MM submission, March 2007

**Table 10. Information provided on projections**

Category of Information	Level of information provided	Comments
WEM and WAM projections	+	WEM and WAM scenarios are provided for the forestry and agricultural sector. WEM and two level WAM scenarios are provided for the energy sector.
Policies included in each projection	++	Full description of scenarios under WOM, WEM, and WAM for Energy Sector. Scenarios under WEM and WAM are briefly described for Agriculture and Forestry
Expressed relative to historic reference year data	0	NO
Starting year	+++	1990/2000
Split of projections	+	Three sectors, WEM and WAM scenarios
Presentation of results	+	Mainly graphs are provided; sometimes there are figures for the sectors considered.
Description of methodologies	++	The description of the MARKAL model for the projections in the energy sector as well as the main indicators which are the inputs is extensive.
Sensitivity analysis	0	Sensitivity analysis has not been done for the projections. However, it has been done for projected energy production and consumption regarding fuel prices on the international markets.
Discussion of uncertainty	0	NO
Details of parameters and assumptions	++	Extensive for the energy sector. Provided for agriculture and forestry.
Indicators for projections	+	Limited number

Source: Estonia's MM submission, March 2007 and 4<sup>th</sup> NC

**Table 11. Parameters for Projections**

1. Mandatory parameters on projections	2005	2010	2015	2020	Units
<b>Assumptions for general economic parameters</b>					
GDP (value at given years or annual growth rate and base year)	7.469	9.892	12.39	14.88	Billion EUR 2000
Population (value at given years or annual growth rate and base year)	1.35	1.35	1.4	1.4	million
International coal prices at given years	1.6	1.6	1.6	1.6	EUR/GJ
International oil prices at given years	4.5	5.8	7.1	8.4	EUR/GJ
International gas prices at given years	3.2	4.16	0.12	6.08	EUR/GJ
<b>Assumptions for the energy sector</b>					

Total gross inland consumption (split by oil, gas, coal, renewables, nuclear, other)					
oil shale	11 - - 13				Mt
Total electricity production by fuel type (oil, gas, coal, renewables, nuclear, other)					
renewable sources (in electricity generation)	5.1				%
electricity consumption	6.5 - 8				TWh
heat	9	9	9		TWh
Energy demand by sector split by fuel (delivered)					
Assumptions on weather parameters, especially heating or cooling degree days					
<b>Assumptions for the industry sector</b>					
<i>For Member States using macroeconomic models:</i>					
The share of the industrial sector in GDP and growth rate					
<i>For Member States using other models:</i>					
The production index for industrial sector					
<b>Assumptions for the transport sector</b>					
<i>For Member States using macroeconomic models:</i>					
The growth of transport relative to GDP					
<i>For Member States using other models:</i>					
The growth of passenger person kilometers					
The growth of freight tonne kilometers					
<b>Assumptions for buildings (in residential and commercial or tertiary sector)</b>					
<i>For Member States using macroeconomic models:</i>					
The level of private consumption (excluding private transport)					
The share of the tertiary sector in GDP and the growth rate					
<i>For Member States using other models:</i>					
The rate of change of floor space for tertiary buildings and dwellings					
The number of dwellings and number of employees in the tertiary sector					
<b>Assumptions in the agriculture sector</b>					
<i>For Member States using macroeconomic models:</i>					
The share of the agriculture sector in GDP and relative growth					
<i>For Member States using other models:</i>					
Livestock numbers by animal type (for enteric fermentation beef, cows, sheep, for manure management pigs and poultry)					
Cows					
Sheep					
Pigs					
Poultry					
The area of crops by crop type					
Emissions factors by type of livestock for enteric fermentation and manure management (t)					
<b>Assumptions in the waste sector</b>					
Waste generation per head of population or tonnes of municipal solid waste					
The organic fractions of municipal solid waste					
Municipal solid waste disposed to landfills, incinerated or composted (in tonnes or %)					
<b>Assumptions in the forestry sector</b>					

Forest definitions					
Minimum Tree Crown Cover	30%	30%	30%	30%	percent
Minimum Height	1.3	1.3	1.3	1.3	meter
minimum area	0.5	0.5	0.5	0.5	ha
minimum width (linear formations)	20	20	20	20	meter
Areas of:					
managed forests	2288	2325	2363	2400	th. ha
unmanaged forests					

<b>2. Recommended parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>Units</b>
<b>Assumptions for general economic parameters</b>					
GDP growth rates split by industrial sectors in relation to 2000					
Comparison projected data with official forecasts					
<b>Assumptions for the energy sector</b>					
National coal, oil and gas energy prices per sector (including taxes)					
National electricity prices per sector as above (may be model output)					
Total production of district heating by fuel type					
<b>Assumptions for the industry sector</b>					
Assumptions fluorinated gases:					
Aluminum production and emissions factors					
Magnesium production and emissions factors					
Foam production and emissions factors					
Stock of refrigerant and leakage rates					
<i>For Member States using macroeconomic models:</i>					
Share of GDP for different sectors and growth rates					
Rate of improvement of energy intensity (1990 = 100)					
<i>For Member States using other models:</i>					
Index of production for different sectors					
Rate of improvement or index of energy efficiency					
<b>Assumptions for buildings (in residential and commercial / tertiary sector)</b>					
<i>For Member States using macroeconomic models:</i>					
Share of tertiary and household sectors in GDP					
Rate of improvement of energy intensity					
<i>For Member States using other models:</i>					
Number of households					

Number of new buildings					
Rate of improvement of energy efficiency (1990 = 100)					
<b>Assumptions for the transport sector</b>					
<i>For Member States using econometric models:</i>					
Growth of transport relative to GDP split by passenger and freight					
Improvements in energy efficiency split by vehicle type					
Improvements in energy efficiency split by vehicle type, whole fleet/new cars					
Rate of change of modal split (passenger and freight)					
Growth of passenger road kilometers					
Growth of passenger rail kilometers					
Growth of passenger aviation kilometers					
Growth of freight tonne kilometers on road					
Growth of freight tonne kilometers by rail					
Growth of freight tonne kilometers by navigation					
<b>Assumptions for the agriculture sector</b>					
<i>For Member States using econometric models:</i>					
Agricultural trade (import/export)					
Domestic consumption (e.g. milk/beef consumption)					
<i>For Member States using other models:</i>					
Development of area of crops, grassland, arable, set-aside, conversion to forests etc					
Macroeconomic assumptions behind projections of agricultural activity					
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)					
Development of farming types (e.g. intensive conventional, organic farming)					
Distribution of housing/grazing systems and housing/grazing period					
Parameters of fertilizer regime:					
Details of fertilizer use (type of fertilizer, timing of application, inorganic/organic ratio)					
Volatilization rate of ammonia, following spreading of manure on the soil					
Efficiency of manure use					
Parameters of manure management system:					
Distribution of storage facilities (e.g. with or without cover):					
Nitrogen excretion rate of manures					
Methods of application of manure					
Extent of introduction of control measures (storage systems, manure application), use of best available techniques					
Parameters related to nitrous oxide emissions from agricultural soils					
Amount of manure treatment					

**Source:** Estonia's MM submission, March 2007 and 4<sup>th</sup> NC