

Cyprus

National Projections of Greenhouse Gases Emissions

Policies and Measures for the Reduction
of Greenhouse Gases Emissions

2013 Submission

to the European Commission

under article 3(2) of decision no 280/2004/EC of the
European Parliament and of the Council concerning a
mechanism for monitoring community greenhouse gas
emissions and for implementing the Kyoto Protocol

Department of Environment

Ministry of Agriculture, Natural
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1. INTRODUCTION

This report has been prepared by the Department of Environment of the Ministry of Agriculture, Natural Resources and Environment, on behalf of the Republic of Cyprus. This document, accompanied by the reporting template, forms the 2013 report that is required to submit to the European Commission under Article 3(2) of Decision 280/2004/EC concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.

The Ministry of Agriculture, Natural Resources and Environment and in particular the Department of Environment is the Cyprus competent authority for climate change. Large part of this topic is the program for the reduction of greenhouse emissions. However, jurisdiction for measures to reduce greenhouse gas emissions is distributed among several Ministries of the Government.

The highly fragmented responsibilities for climate change mitigation among the different Ministries, causes difficulties for coherent monitoring and evaluation of policies and measures towards the reduction of greenhouse gases (GHG) emissions. This was due to a lack of complete and comparable information on policies and measures and also to the fact that many measures, e.g. in energy consumption, transport or waste management, are not undertaken primarily for the purpose of climate change mitigation. A variety of other environmental, social and economic needs are responsible for specific action.

Further cooperation and more attention are needed for proper GHG emissions monitoring, that will have a positive, measured and evaluated, side effect.

In view of the implementation of the Effort Sharing Decision (406/2009/EC), the system of designing, implementing, monitoring and adapting the strategy for the reduction of greenhouse gases emissions, is under review.

The data presented in this report concerns the areas under the effective control of the Government of the Republic of Cyprus.

2. NATIONAL POLICIES AND MEASURES

This section presents the policies and measures that the Cyprus Government and stakeholders are taking to reduce greenhouse gas emissions. While the Department of Environment has the overall responsibility for ensuring that a programme is put in place to deliver the reduction of greenhouse gases, all the administration levels and services need to contribute in meeting these targets.

The selection of policies and measures presented below was made by using the following criteria: (a) the technological and commercial maturity of the available technologies, so that their immediate promotion is possible, (b) their direct and measurable performance regarding the reduction of CO₂ emissions and (c) the particular structural features of Cypriot economy and society.

Emission reductions from each policy and measure are presented in detail in the next chapter, in the scenarios “*With Existing Measures*” and “*With Additional Measures*”.

Energy calculations, potentials and forecasts are in line with context of the “Official projection of total production of electrical energy (GWh) and power (MW) for the period 2013 – 2022” as this was published revised on 5/4/2013.

2.1. POLICY A. ENERGY

The emissions of the energy sector except transport increased from 3,038 Gg in 1990 to 4,887 Gg in 2011, corresponding to 61% increase. In 2011, emissions decreased by 5% compared to 2010. Energy is the sector which has to contribute the most in the reduction of greenhouse gases of Cyprus. The import of natural gas, and its initial use for electricity production, is expected to contribute considerable reductions of emissions in 2020. The main energy consumers for 2011 according to the energy balance of 2011 (Energy Service, 2013) are presented in Figure 1.

Cyprus is the southernmost region of the European Union at the crossroads of three continents, with a dominant position in the Mediterranean and South East. In general Cyprus presents the common energy problems of most islands:

- (a) Isolated energy system.
- (b) High rates of economic and social development involving high rates of growth in energy demand.
- (c) High cost of energy supply.
- (d) High dependence on petroleum products - small supply security.
- (e) Seasonal variations in energy demand.
- (f) Maximum operation of the system of production and distribution of electricity in peak load demand.
- (g) Strict limitations of protection and promotion of the island environment that act as a disincentive to develop initiatives in energy investments.

The competent authority in relation to energy policies is the Energy Service of the Ministry of Commerce, Industry and Tourism.

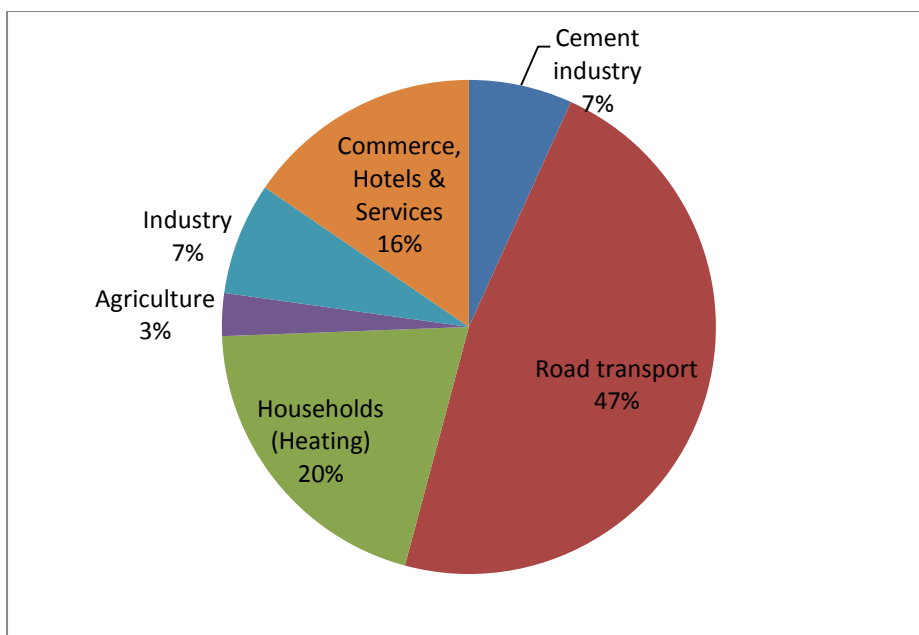


Figure 1. Main energy consumers in 2011

2.1.1. A1. NATURAL GAS

The Government of Cyprus, recognizing the positive contribution that the introduction and use of natural gas will have on the economy and the environment of Cyprus, has decided to introduce natural gas to Cyprus, primarily for use in electricity generation. It is however expected that shortly after its arrival, natural gas will be supplied to the heavy industry, while in the future natural gas will also be used in other sectors.

According to the up-to-date available information, natural gas is expected in Cyprus by 2018. Consequently, the Electricity Authority of Cyprus (single conventional fuel electricity producer) has included natural gas in its new development strategy. By importing natural gas, apart from the reduction of emissions from the actual use of the natural gas, this action will also contribute positively to emission reductions through the increased efficiency of the newer technologies used.

Table 1. Description of the measure “natural gas”

Measure	A1. Import of natural gas for electricity production
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism
Other involved authorities	(a) Cyprus Energy Regulatory Authority (b) Public Natural Gas Company (DEFA) (c) Electricity Authority of Cyprus (d) Department of Environment
Type	Political, legislative
National legislation	K.Δ.Π. 115/2006

Relevant European legislation	Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC
Measures towards attainment	(a) Import and use of natural gas for electricity production (b) Installation of combined cycle electricity production units using natural gas as fuel (c) Decommissioning or conversion of existing electricity production units
Comments	According to the delays noticed for the procedures and political decisions necessary for the import of natural gas, 2018 has been considered by the EAC as a more realistic date by which commercial supply of natural gas to Cyprus will commence. Therefore, 2018 has been used as the year of import of natural gas for the “With Existing Measures” and the “With Additional Measures” scenario. Natural gas is not included in the “Without measures” scenario.

2.1.2. A2. RENEWABLE ENERGY SOURCES

The share of renewable energy sources in the primary energy consumption, based on the energy balance of Cyprus, has increased from 1.7% in 2007 to 4.2% in 2011 (Energy Service, 2013). Table 2 shows the distribution of the renewable energy sources according to the type of renewable technology and consumer.

Table 2. Renewable energy sources in the energy balance of Cyprus, 2011 (Energy Service, 2013)

	Biofuels	Solar Thermal	Geothermal	Biomass	Electricity - Biomass	Electricity - Wind	Electricity - PV Systems	TOTAL
Cement industry				6953				6953
Road transport	16012							16012
Households (Heating)		53542	1045	5493			101	60181
Agriculture				4277	1023			5300
Industry				210				210
Commerce, Hotels & Services		9449		2615		5	46	12115
TOTAL	16012	62991	1045	19548	1023	5	147	100771
Electricity to Grid					3415	9826	880	14121

Renewable energy sources and energy efficiency is promoted to the public by provisions of financial support schemes. The first support scheme was created in 1999 and the latest version, is for the period 2009 to 2013, and was published in August 2010. The scheme has been well accepted by the public from the start of its implementation and the number of applications submitted annual to the competent

authority for subsidies is increasing considerable year by year. The scheme is separated into three categories:

- (a) promotion of electricity production from large commercial wind farms, solar thermal and photovoltaic systems, the utilization of biomass
- (b) promotion of Energy Conservation and the Renewable Energy Sources for Individuals and Organizations that not exercise economic activity
- (c) promotion of Energy Conservation and the Renewable Energy Sources for Individuals and legal entities that exercise economic activity

According to the particular category, there are different buying price for the kWh produced which is further differentiated according to the type of technology implemented. The support scheme has been approved by the DG Competition (C(2009)5398).

The largest projects for which subsidy has been approved so far, are six commercial scale wind farms with total installed capacity of 157.5 MWp (Cyprus Institute of Energy, 2010a). The largest of the wind farms is already in operation since August 2010 (installed capacity 82MW). 1.74 MWp of large photovoltaic plants has also been accepted for subsidy appraisal and further approval during 2009 and 2.26 MWp in 2010 (total of 32 projects) (Cyprus Institute of Energy, 2010b). All the projects are expected to be operational within 2012. It should be noted that the total installed capacity of the current electricity producing installations is approximately 1,000 MWp.

According to Directive 2009/28/EC, the share of renewable energy in gross final energy consumption in the European Union for 2020 should at least reach 20%. The specific binding target for Cyprus is 13%. Also, the share of energy from renewable sources in all forms of transport (vehicles, trains, metro) in 2020 should represent at least 10% of the final consumption of energy in transport. Each Member State is obliged to submit to the Commission the National Action Plan for Renewable Energy, which includes, inter-alia, the target path for achieving the targets for the share of RES in electricity, heating and cooling, and transport. The estimated target trajectory of energy from renewable sources for the years 2010, 2015 and 2020 for Cyprus to reach the goal of 13% and the intermediate targets to reach the 10% renewables in transport by 2020 are presented in Table 3.

Details on how Cyprus will achieve the targets are available in the National Renewable Energy Action Plans that has been prepared according to Article 4 of the renewable energy Directive (2009/28/EC) and should have been submitted by 30 June 2010 (Energy Service, 2010).

Table 3. Summary of the binding targets for Renewable energy sources in Cyprus

	2010	2015	2020
Renewable energy sources to reach 13% in 2020			
Heating and cooling	16.2%	20%	23.5%
Electricity production	1.3%	8.4%	16%
Transport	2.2%	3.1%	4.95
Total share of RES	6.5%	9.0%	13%
Renewable energy sources in transport to reach 10% in 2020			
Transport	2.2%	3.3%	10%

A2.1. RENEWABLE ENERGY SOURCES IN ELECTRICITY PRODUCTION

Electricity production contributed 52% to the emissions of the energy sector in 2011, which corresponds to 41% to the total emissions of the country (excluding LULUCF) (Department of Environment, 2013). This corresponds to 3,722 Gg CO₂ e., whereas the total emissions of the country without LULUCF were 9,154 Gg CO₂ e. All units producing electricity in Cyprus for public use running on conventional fuels are operated by the Electricity Authority of Cyprus. The main fuel is HFO and some contribution of gas oil. Electricity production is regulated by the Emissions Trading System.

Table 4. Description of the measure A2.1

Measure	A2.1. Use of renewable energy sources for electricity production
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism
Other involved authorities	(a) Cyprus Energy Regulatory Authority (b) Transmission System Operator (c) Ministry of Finance (d) Department of Town Planning and Housing, Ministry of Interior (e) Department of Environment, Ministry of Agriculture, Natural Resources and Environment
Type	Legislative, voluntary
National legislation	Law No. 33(I)/2003 on the promotion and encouragement of the use of renewable energy sources and Energy Conservation Law 110(I)/2011 establishing a European emissions trading system and other relevant issues
Relevant European legislation	Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity from renewable energy sources in the internal electricity market* Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC

	Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community		
Target	RES share in electricity production		
	2010	2015	2020
	1.3%	8.4%	16%
Measures towards attainment	(a) RES support schemes (b) Informational campaigns (c) Implementation of relevant legislation		
Comments	Directive 2009/29/EC and its predecessor, 2003/87/EC indirectly promote the production of electricity from RES.		

* Directive 2001/77/EC is repealed by Directive 2009/28/EC from 1 January 2012. Moreover, from 1 April 2010, Article 2, paragraph 2 of Article 3 and Articles 4 to 8 will be deleted

A2.2. RENEWABLE ENERGY SOURCES FOR HEATING AND COOLING

Heating and cooling for industrial, housing and tertiary sectors, contributed 9% to the emissions of the energy sector in 2011, and 6.9% to the total emissions of the country (excluding LULUCF) (Department of Environment, 2013). The RES technologies promoted through the scheme are solar thermal, biomass and geothermal.

Table 5. Description of the measure A2.2

Measure	A2.2. Renewable energy sources for heating and cooling
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism
Other involved authorities	(f) Department of Town Planning and Housing, Ministry of Interior (g) Department of Environment, Ministry of Agriculture, Natural Resources and Environment (h) Department of Labour Inspection, Ministry of Labour and Social Insurance
Type	Legislative, voluntary
National legislation	Law No. 33(I)/2003 on the promotion and encouragement of the use of renewable energy sources and Energy Conservation Law No. 142(I)/2006 regulating energy efficiency in buildings Law No. 30(I)/2009 amending Law No. 142(I)/2006 regulating energy efficiency in buildings Law No. 56(I)/2003 on Integrated Pollution Prevention Control (with amending laws no. 15(I)/2006, 12(I)/2008)
Relevant European legislation	Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity from renewable energy sources in the internal electricity market*

	<p>Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC</p> <p>Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community</p> <p>Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control and related amendments</p>		
Target	RES share in energy consumption for heating and cooling		
	2010	2015	2020
	16.2%**	20%**	23.5%**
Measures towards attainment	<p>(d) RES support schemes</p> <p>(e) Informational campaigns</p> <p>(f) Implementation of relevant legislation</p>		
Comments	<p>Directive 2009/29/EC and its predecessor, 2003/87/EC indirectly promote the production of energy conservation through the use of alternative technologies using RES</p> <p>Directive on waste</p> <p>IPPC directive is indirectly promoting anaerobic digestion to livestock breeding units.</p>		

* Directive 2001/77/EC is repealed by Directive 2009/28/EC from 1 January 2012. Moreover, from 1 April 2010, Article 2, paragraph 2 of Article 3 and Articles 4 to 8 will be deleted

** % includes the target from measure A5, i.e. use of waste as fuel for cement industry; does not include the use of waste as fuel for cement industry.

A2.3. RENEWABLE ENERGY SOURCES IN TRANSPORT

According to the Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC and the action plan submitted by Cyprus for the achievement of the target set, RES in transport should be 2.2% in 2010, 3.1% in 2015 and 4.9% in 2020. Moreover, in order to reach the 10% target by 2020, the aim is to have 2.2% biofuels in 2010 and 3.3% in 2015.

Table 6. Description of the measure A2.3

Measure	A2.3 Renewable energy sources in transport		
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism		
Other involved authorities	(a) Department of Customs, Ministry of Finance (b) Department of Environment		
Type	Legislative, mandatory		
National legislation	Law No. 33(I)/2003 on the promotion and encouragement of the use of renewable energy sources and Energy Conservation Law No.148(I)/2003 on the petroleum products and fuels specification Decrees 63/2008 and 16/2009 on the content of biofuels in transport conventional fuels		
Relevant European legislation	Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity from renewable energy sources in the internal electricity market* Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC Decision 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020		
Target	RES share in energy for transport		
	2010	2015	2020
	2.2%	3.3%	10%
Measures towards attainment	(a) Tax exemption for biofuels (b) Implementation of grant scheme for installations producing biofuels (c) Promotion of electric vehicles		
Comments	Decision 406/2009/EC is requiring the sector of transport to reduce its emissions.		

* Directive 2001/77/EC is repealed by Directive 2009/28/EC from 1 January 2012.

2.1.3. A3. ENERGY EFFICIENCY AND SAVINGS

According to the Directives 2002/91/EC and 2010/31/EC, the member states have submitted to the European commission their action plan to achieve the target for energy savings in buildings. Measure A3, presents the targets set by Cyprus through the action plan submitted. Tables in the pages that follow describe the measures included in the energy efficiency and savings measure.

A3.1. SAVINGS FROM ENERGY EFFICIENCY IN RESIDENTIAL BUILDINGS

Table 7. Description of the measure A3.1.

Measure	A3.1. Savings from energy efficiency in residential buildings		
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism		
Other involved authorities	(a) Ministry of Interior (b) Municipalities (c) Department of Environment		
Type	Legislative, compulsory		
National legislation	Law No. 142(I)/2006 regulating energy efficiency of buildings and amending Law No. 30(I)/2009		
Relevant European legislation	Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings Directive 2010/31/EC of the European parliament and of the council of 19 May 2010 on the energy performance of buildings (recast) Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020		
Target	Energy savings		
	2010	2015	2020
		12% electricity 0.6% heating & cooling	24% electricity 1.2% heating & cooling
Measures towards attainment	(a) Implementation of national action plan on energy efficiency (b) Implementation of national legislation		
Comments	Decision 406/2009/EC is also requiring the sector of buildings to reduce its emissions.		

A3.2. SAVINGS FROM ENERGY EFFICIENCY IN TERTIARY BUILDINGS

Table 8. Description of the measure A3.2

Measure	A3.2. Savings from energy efficiency in tertiary buildings		
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism		
Other involved authorities	(a) Ministry of Interior (b) Municipalities (c) Department of Environment		
Type	Legislative, compulsory		
National legislation	Law No. 142(I)/2006 regulating energy efficiency of buildings and amending Law No. 30(I)/2009		
Relevant European legislation	Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings Directive 2010/31/EC of the European parliament and of the council of 19 May 2010 on the energy performance of buildings (recast) Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020		
Target	Energy savings		
	2010	2015	2020
		1.7% electricity 0.1% heating & cooling	3.5% electricity 0.2% heating & cooling
Measures towards attainment	(c) Implementation of national action plan on energy efficiency (d) Implementation of national legislation		
Comments	Decision 406/2009/EC is also requiring the sector of buildings to reduce its emissions.		

A3.3. SAVINGS FROM EFFICIENT BULBS

Table 9. Description of the measure A3.3

Measure	A3.3. Savings from efficient bulbs		
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism		
Other involved authorities	Department of Environment		
Type	Legislative, compulsory		
National legislation	Law No. 31/2009 on energy end-use efficiency and energy services		
Relevant European legislation	Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020		
Target	Energy savings		
	2010	2015	2020
		3.2% electricity	2% electricity
Measures towards attainment	(a) information campaign and promotion of energy efficient lamps		
Comments	Decision 406/2009/EC is also requiring the sector of buildings to reduce its emissions.		

A3.4. SAVINGS FROM INSULATION IN RESIDENTIAL SECTOR

Table 10. Description of the measure A3.4

Measure	A3.4. Savings from insulation in residential sector		
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism		
Other involved authorities	Department of Environment		
Type	Legislative, compulsory		
National legislation	Law No. 31/2009 on energy end-use efficiency and energy services		
Relevant European legislation	<p>Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.</p> <p>Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings</p> <p>Decision 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020</p>		
Target	Energy savings		
	2010	2015	2020
		1.7% electricity 0.1% heating & cooling	1.5% electricity 0.1% heating & cooling
Measures towards attainment	Grant scheme for energy conservation		
Comments	Decision 406/2009/EC is also requiring the sector of buildings to reduce its emissions.		

A3.5. SAVINGS IN EXISTING COMPANIES

Table 11. Description of the measure A3.5

Measure	A3.5. Savings in existing companies		
Competent authority	Energy Service, Ministry of Commerce, Industry and Tourism		
Other involved authorities	Department of Environment		
Type	Legislative, compulsory		
National legislation	Law No. 31/2009 on energy end-use efficiency and energy services		
Relevant European legislation	<p>Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.</p> <p>Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020</p>		
Target	Energy savings		
	2010	2015	2020
		2.1% electricity 0.1% heating & cooling	1.3% electricity 0.07% heating & cooling
Measures towards attainment	Grant scheme for energy conservation		
Comments	Decision 406/2009/EC is also requiring the tertiary sector to reduce its emissions.		

2.1.4. A4. IMPROVEMENT OF DISTRIBUTION SYSTEMS

The distribution systems are under the management of the Transition System Operator of Cyprus. Through its collaboration with the Electricity Authority of Cyprus which is the only conventional electricity producer and provider in the country, there is an annual pal for improvement of the electricity distribution system. No specific target is available for the reduction of losses; the target was set as annual reduction of emissions from losses by 0.1% (reduction from electricity emissions). Competent authority is the Transition System Operator of Cyprus, whereas other involved authorities are the Electricity Authority of Cyprus and the Department of Environment.

2.1.5. A5. PROMOTION OF BIOMASS AND ALTERNATIVE FUELS IN INDUSTRY

There are two cement plants in operation in Cyprus which have merged into one company in 2009. Both cement plants stopped their operation since the late 2011, that a new cement plant started its operation. One of the advantages of the new installation, in addition to the higher efficiency in production, is that it can use larger amounts of biomass and alternative fuels for the production of thermal energy.

Table 12. Description of the measure A5

Measure	A5. Promotion of biomass and alternative fuels in industry		
Competent authority	Energy Service		
Other involved authorities	Department of Environment		
Type	Voluntary		
National legislation	Law No. 33(I)/2003 on the promotion and encouragement of the use of renewable energy sources and Energy Conservation		
Relevant European legislation	Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity from renewable energy sources in the internal electricity market* Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community		
Target	Energy production from waste		
	2010	2015	2020
		3.6% of energy	3.8% of energy
Measures towards attainment			
Comments	The implementation of the directive 2009/29/EC gives a good incentive for the promotion of alternative fuels for thermal energy production in cement manufacturing.		

* Directive 2001/77/EC is repealed by Directive 2009/28/EC from 1 January 2012. Moreover, from 1 April 2010, Article 2, paragraph 2 of Article 3 and Articles 4 to 8 will be deleted

2.2. POLICY B. TRANSPORT

In 2011, road transport emissions contributed 24.5% of the total national emissions excluding LULUCF (Department of Environment, 2013). The emissions of road transport increased by 91% compared to 1990. According to information from the International Road Federation, Cyprus has the highest car ownership rate in the world with 742 cars per 1,000 people (International Road Federation, 2009). Other means of transport are almost inexistent: 3% public transport and bicycle less than 2% (Ministry of Communications and Public Works, 2010).

In addition to the importance for emissions, transport has been an issue of particularly great interest to the society of Cyprus, due to the very large growth of the number of privately owned cars and the associated problems in traffic that are experienced, especially in the capital, Nicosia. Even though many studies have been completed since the 1990s on how to deal with traffic in the urban areas of Cyprus and especially Nicosia, only recently (end of 2009) action has been taken and measures are implemented.

2.2.1. B1. PROMOTION OF PUBLIC TRANSPORT

According to the plans of the Ministry of Communications and Public Works, the target is to increase the contribution of public transport from 2% in 2009 to 10% by 2015 (Department of Environment, 2010). Towards this end, at the end of 2009 the legal framework concerning public transport was revised, which has allowed the development of the new urban, suburban and intercity bus routes and schedules.

Table 13. Description of the measure B1

Measure	B1. Promotion of public transport		
Competent authority	Ministry of Communications and Public Works		
Other involved authorities	Department of Environment		
Type	Policy		
National legislation	Law No. 101(I)/2009 on the access to the profession of road transport (amending) Law No. 96(I)/2009 on the regulation of road transport (amending)		
Relevant European legislation	Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020		
Target	Reduction in fuel consumption for transport		
	2010	2015	2020
		1.9%	4.4%
Measures towards	(a) Development and implementation of mobility master plans and land use transportation studies for the four large urban		

attainment	<p>areas in the areas under the effective control of the Republic of Cyprus</p> <p>(b) Development of infrastructure for public transport (bus lanes, bus priority lanes, new bus stops, new bus stations)</p> <p>(c) Development and implementation of “park-and-ride” systems</p> <p>(d) Study for the development of a tram system</p>
Comments	Approximately 50% of the non-ETS emissions of Cyprus are from transport, therefore considerable effort is needed by the sector to reduce the overall non-ETS emissions

2.2.2. B2. PROMOTION OF ALTERNATIVE TECHNOLOGIES

The promotion of hybrid and electric vehicles is part of the energy efficiency scheme of the Ministry of Commerce, Industry and Tourism. This Scheme, which includes both subsidies, tax reductions and reduced circulation fees, includes the following categories and subcategories for transport (Energy Service, 2010):

- Purchase of a new Hybrid Vehicle
- Purchase of a new Fuel Flexible Vehicle - FFV/Dual Propulsion Vehicle
- Purchase of a new Electric Vehicle
- Purchase of a new low carbon emission vehicle

Table 14. Description of the measure B2

Measure	B2. Promotion of alternative technologies (hybrid and electric vehicles)		
Competent authority	Ministry of Commerce, Industry and Tourism		
Other involved authorities	(a) Ministry of Communications and Public Works (b) Department of Environment		
Type	Voluntary		
National legislation	Law No. 31/2009 on energy end-use efficiency and energy services		
Relevant European legislation	Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community’s greenhouse gas emission reduction commitments up to 2020		
Target	Energy savings in toe		
	2010	2015	2020
		0.05%	0.04%
Hybrid			

Electric		0.002%	0.002%
Measures towards attainment	Grant scheme		
Comments	50% of the non-ETS emissions of Cyprus are from transport, therefore considerable effort is needed by the sector to reduce the overall non-ETS emissions		

2.2.3. B3. PROMOTION OF LOW EMISSION VEHICLES

In addition to the hybrid and electric vehicles, low emission vehicles are included in the energy efficiency scheme of the Ministry of Commerce, Industry and Tourism. This measure is also promoted by the implementation of the Regulation.

Table 15. Description of the measure B3

Measure	B3. Promotion of low emission vehicles		
Competent authority	Ministry of Commerce, Industry and Tourism		
Other involved authorities	(a) Ministry of Communications and Public Works (b) Department of Environment		
Type	Voluntary		
National legislation	Law No. 31/2009 on energy end-use efficiency and energy services		
Relevant European legislation	Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC Decision 406/209/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 Regulation No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO ₂ emissions from light-duty vehicles		
Target	Energy savings		
	2010	2015	2020
		0.092%	0.087%
Measures towards attainment	Grant scheme		
Comments	50% of the non-ETS emissions of Cyprus are from transport, therefore considerable effort is needed by the sector to reduce the overall non-ETS emissions		

2.2.4. B4. PROMOTION OF REPLACEMENT OF VEHICLES

Since 2008, there are in place withdrawal of old vehicle schemes by the Ministry of Communications and Public Works. Until 2011 24,752 vehicles have been withdrawal from the start of the scheme. One of the conditions that had to be met during the latest scheme (end of 2010) was that the owner of the vehicle withdrawn had to buy a new vehicle with CO₂ emissions lower or equal to 165 g/km. It is a voluntary measure which is expected to increase by 0.5% annually, starting from 0.5% in 2012. Expected reduction in fuel consumption is 1.9% in 2015 and 4.4% in 2020. Competent authority for the implementation of the measure is the Department of Road Transport.

2.3. POLICY C. WASTE

With the Landfill Directive being the main guiding force, in combination to the improvement of the infrastructure of the country, Cyprus has been developing during the recent years the revised strategy for solid waste management. The management of the municipal solid waste is under the competence of the Ministry of Interior.

2.3.1. C1. METHANE RECOVERY FROM EXISTING AND NEW WASTE MANAGEMENT SITES

All the solid waste management sites in Cyprus are currently under replacement or improvement. Currently in Cyprus, there are:

- (a) Two landfills are in operation (Pafos landfill and Koshi landfill for Larnaca and Ammochostos districts)
- (b) Two landfills are in the design phase (Nicosia and Limassol landfills) and are expected to be in operation by 2014.

Biogas collection systems are in the design of all landfills.

Table 16. Description of the measure C1

Measure	C1. Methane recovery from existing and new waste management sites
Competent authority	Ministry of Interior
Other involved authorities	Department of Environment
Type	Legal
National legislation	Law No. 215(I)/2002 on solid and hazardous waste and amendments No. 162(I)/2005, 17(I)/2006, 63(I)/2009 Decree No. K.Δ.Π. 160/2003 and K.Δ.Π. 161/2003 on application for waste management permit

	Regulations No. Κ.Α.Π. 562/2003 on landfills Law No. 85(I)/2005 on council of disposal or recovery sites of household sites Decree No. Κ.Α.Π. 282/2007 establishing criteria and procedures for the acceptance of waste at landfills		
Relevant European legislation	Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives Council Directive 75/442/EEC of 15 July 1975 on waste Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to article 16 of and Annex II to Directive 1999/31/EC Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste		
Target	Biogas collection		
	2010	2015	2020
	10%	10%	70%
Measures towards attainment			
Comments			

2.3.2. C2. MANAGEMENT OF UNCONTROLLED DISPOSAL SITES

In addition to methane collection, the new waste management sites will allow the discontinuation of operation of the uncontrolled disposal sites that are currently operating.

Table 17. Description of the measure C2

Measure	C2. Management of uncontrolled disposal sites
Competent authority	Ministry of Interior
Other involved authorities	Department of Environment
Type	Policy
National legislation	Law No. 215(I)/2002 on solid and hazardous waste and amendments No. 162(I)/2005, 17(I)/2006, 63(I)/2009 Decree No. Κ.Α.Π. 160/2003 and Κ.Α.Π. 161/2003 on application for waste management permit

	Regulations No. Κ.Α.Π. 562/2003 on landfills Law No. 85(I)/2005 on council of disposal or recovery sites of household sites Decree No. Κ.Α.Π. 282/2007 establishing criteria and procedures for the acceptance of waste at landfills		
Relevant European legislation	Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives Council Directive 75/442/EEC of 15 July 1975 on waste Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to article 16 of and Annex II to Directive 1999/31/EC Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste		
Target	Biogas collection		
	2010	2015	2020
	5%	20%	60%
Measures towards attainment			
Comments			

2.3.3. C3. PROMOTION OF ANAEROBIC DIGESTION - SEWAGE SLUDGE

Even though anaerobic digestion is not clearly stated in the European or national legislation, the technology is preferred by the wastewater treatment plants to comply with the terms stated on the wastewater and air disposal permits. The technology is strongly promoted by the Department of Environment, especially for the large installations that fall under the IPPC directive. Relevant national legislation that encourages the promotion of anaerobic digestion is (a) the Control of Water Pollution (Waste Water Disposal) Regulations 2003, Κ.Α.Π. 772/2003; (b) the Control of Water Pollution (Sensitive Areas for urban waste water discharges) Κ.Α.Π. 111/2004. It is a voluntary measure which is expected to increase by 0.5% annual, starting from 0.5% in 2012.

2.4. POLICY D. AGRICULTURE

2.4.1. D1. PROMOTION OF ANAEROBIC DIGESTION - LIVESTOCK BREEDING WASTE TREATMENT

Even though anaerobic digestion is not clearly stated in the European or national legislation, the technology is preferred by large livestock breeding plants to comply with the terms stated on the wastewater and air disposal permits. The technology is strongly promoted by the Department of Environment, especially for the large installations that fall under the IPPC directive. Relevant national legislation that encourages the promotion of anaerobic digestion is (a) the Control of Water Pollution (Waste Water Disposal) Regulations 2003, Κ.Δ.Π. 772/2003; (b) the Control of Water Pollution (Sensitive Areas for urban waste water discharges) Κ.Δ.Π. 111/2004. It is a voluntary measure which is expected to increase by 1% annually, starting from additional 1% in 2012, until 2015; after 2015, the increase in the reduction will reduce to 0.5% annually.

2.5. OTHER MEASURES

2.5.1. EMISSIONS TRADING SYSTEM

The European Union Emissions Trading System (EU ETS) covers 13 installations in Cyprus, responsible for around 58% of the Cyprus' emissions (Energy Service, 2013). The EU ETS covers electricity generation (three installations) and the main energy-intensive industries of the country, cement production (two installations) and ceramics production (eight installations). Phase II of the system started on 1 January 2008 and will run until 31 December 2012.

2.5.2. LOCAL AUTHORITIES INITIATIVES

In 2008 a new NGO was established in Cyprus, the "Cyprus Energy Agency", funded by the European Commission (75%) and the Union of Cyprus Communities (25%). The purpose of the "Cyprus Energy Agency" is to promote renewable energy sources and innovative technologies, energy efficiency and viable transport. The establishment of the particular NGO has created a new dynamic in the initiatives of local authorities. With the coordination of the organisation, Cypriot communities participate in programs for the reduction of emissions.

Particular attention at the moment is paid to the energy efficiency in municipalities and communities. Already, eleven municipalities and three communities have developed their own Energy Action Plans for the period 2010 to 2020. The measures included are implemented locally and are additional to the measures promoted and implemented by the competent authorities at national level.

The programs in which the municipalities and communities participate are the Covenant of Mayors and the European Islands Network on Energy and Environment (ISLE-PACT). The total reduction in CO₂ emissions has been estimated at 124 Gg CO₂ by 2020.

These measures have been taken into consideration in the “With Additional Measures” scenario.

Further measures have also been designed at local level, with the initiative on municipalities and communities. An example is the municipality of Aglantzia that has designed the following measures and is in the stage of implementation:

- (a) Established an Inter-municipal Bicycle Company for bicycle hiring in central Nicosia - in collaboration with other municipalities of central Nicosia
- (b) “Car-pooling” service: service providing transport of people from other cities to Nicosia – in collaboration with the University of Cyprus
- (c) Improvement of pedestrian routes in the municipality (approximately 5000 metres)
- (d) Improvement of cycling routes in the municipality (approximately 2500 metres)
- (e) Improvement and expansion of green areas in the municipality

3. ARTICLE 3(2)(B) NATIONAL PROJECTIONS

The year 2009 has been chosen as reference year, since is the inventory year just before the obligation of reporting (2010). Comparison however of the projections is also made to 1990 (reference year for the UNFCCC), 2005 (reference year for ESD) and 2011 (latest inventory year).

3.1. WITHOUT MEASURES PROJECTIONS

Three different projections for gross electricity production were examined for choosing the Without measures projections (Figure 2):

- The Electricity Authority of Cyprus projection sent on 30/05/2013 to the compilers of this report, based on “Official projection of total production of electrical energy (GWh) and power (MW) for the period 2013 – 2022”, prepared by the Cyprus Transmission System Operator as published on 5/4/2013.
- The minimum projection of the Cyprus Transmission System Operator published on 15/3/2013.
- The PRIMES projections, version 7/1/13.

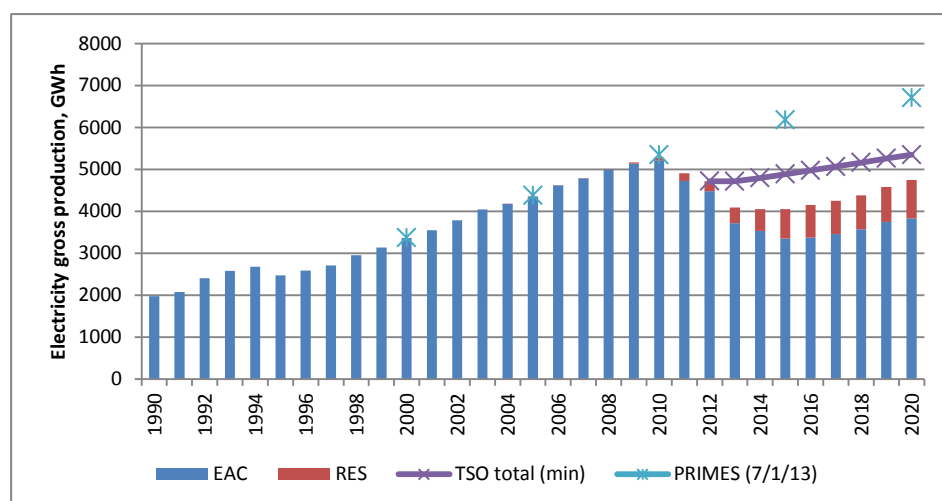


Figure 2. Three projections for gross electricity production examined for the Without measures

Given the recent financial situation in Cyprus, the projections of the EAC were considered the most appropriate to use. Therefore, the Without measures projections (Figure 3) are based on:

- Gross electricity production and respective CO₂ emissions prepared by the Electricity Authority of Cyprus and sent on 30/05/2013, based on “Official projection of total production of electrical energy (GWh) and power (MW) for the period 2013 – 2022”, prepared by the Cyprus Transmission System Operator as published on 5/4/2013.
- The contribution of the other sectors of emissions and gases to the total national inventory report of 2013.

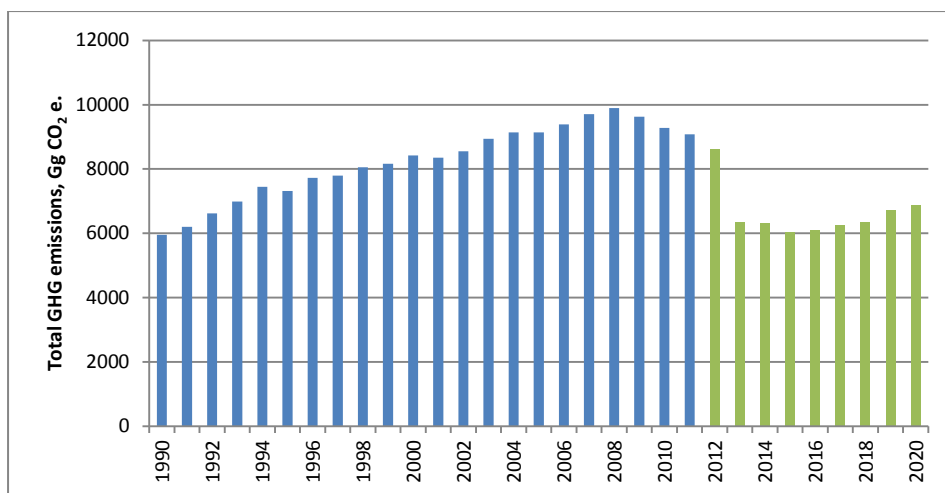


Figure 3. Projections for the Without measures scenario

The parameters used and steps implemented for the estimation of the total greenhouse gases emissions of the country for 2012 to 2020 were as follows:

- (a) For the emissions from electricity production, the projections of the Electricity Authority of Cyprus (EAC) for CO₂ emissions were used. The EAC has included natural gas in its planning for 2019 and 2020 and this is reflected in the projections of emissions. Due to the delays of the import of natural gas, the import of natural gas was not used in the “Without measures” scenario. Thus the emissions for 2019 and 2020 have been replaced with our estimations. The total electricity demand provided by the EAC with the average emission factor for 2014-2018 (0.74 t CO₂/MWh) from the information provided by the EAC and estimated the CO₂ without the import of natural gas.
- (a) The emissions from the other sectors and CO₂, CH₄ and N₂O emissions were estimated using the contribution of each sector and gas to the total in the National Inventory of 2013 (Department of Environment, 2013).

The total greenhouse gases emissions for the period 1990 to 2020 for the business as usual scenario, are presented in Figure 2. The data for 1990 to 2011 is according to the National Inventory Report 2013 (Department of Environment, 2013). Total annual projected emissions for 2010-2020 are presented in Table 18. Projected emissions in 2020 according to the “Without measures” scenario, show an increase of 16% compared to the emissions of 1990 and a reduction by 29% compared to 2009.

Table 18. Total GHG emissions for “Without measures” including LULUCF

Year	1990	2005	2009	2010	2015	2020
Total (Gg CO₂ eq.)	5952	9137	9629	9278	6017	6881
	NIR 2013 (Department of Environment, 2013).				projected	
Change compared to 1990						+16%
Change compared to 2005						-25%
Change compared to 2009						-29%
Change compared to 2011						-24%

3.1.1. EMISSIONS PER SECTOR

The emissions per sector as estimated for the Without measures scenario are presented in Table 19 and Figure 4, in comparison to the inventory data of 1990, 1995, 2000, 2005, 2009 and 2010.

Table 19. “Without Measures” Projections for total GHG emissions per sector (Gg CO₂ equiv.)

	Energy	Industrial activities	Agriculture	LULUCF	Waste	Total incl. LULUCF
1990	4214	728	679	-139	470	5952
1995	5308	805	779	-149	574	7317
2000	6361	831	744	-150	639	8424
2005	6995	915	738	-174	663	9137
2009	7665	763	698	-175	677	9629
2010	7441	642	722	-166	639	9278
2015	4731	462	484	-51	391	6017
2020	5410	528	553	-58	448	6881
2020 compared to 1990	+28%	-27%	-19%	-58%	-5%	+16%
2020 compared to 2005	-23%	-42%	-25%	-67%	-32%	-25%
2020 compared to 2009	-29%	-31%	-21%	-67%	-34%	-29%
2020 compared to 2011	-24%	-24%	-24%	-24%	-24%	-24%

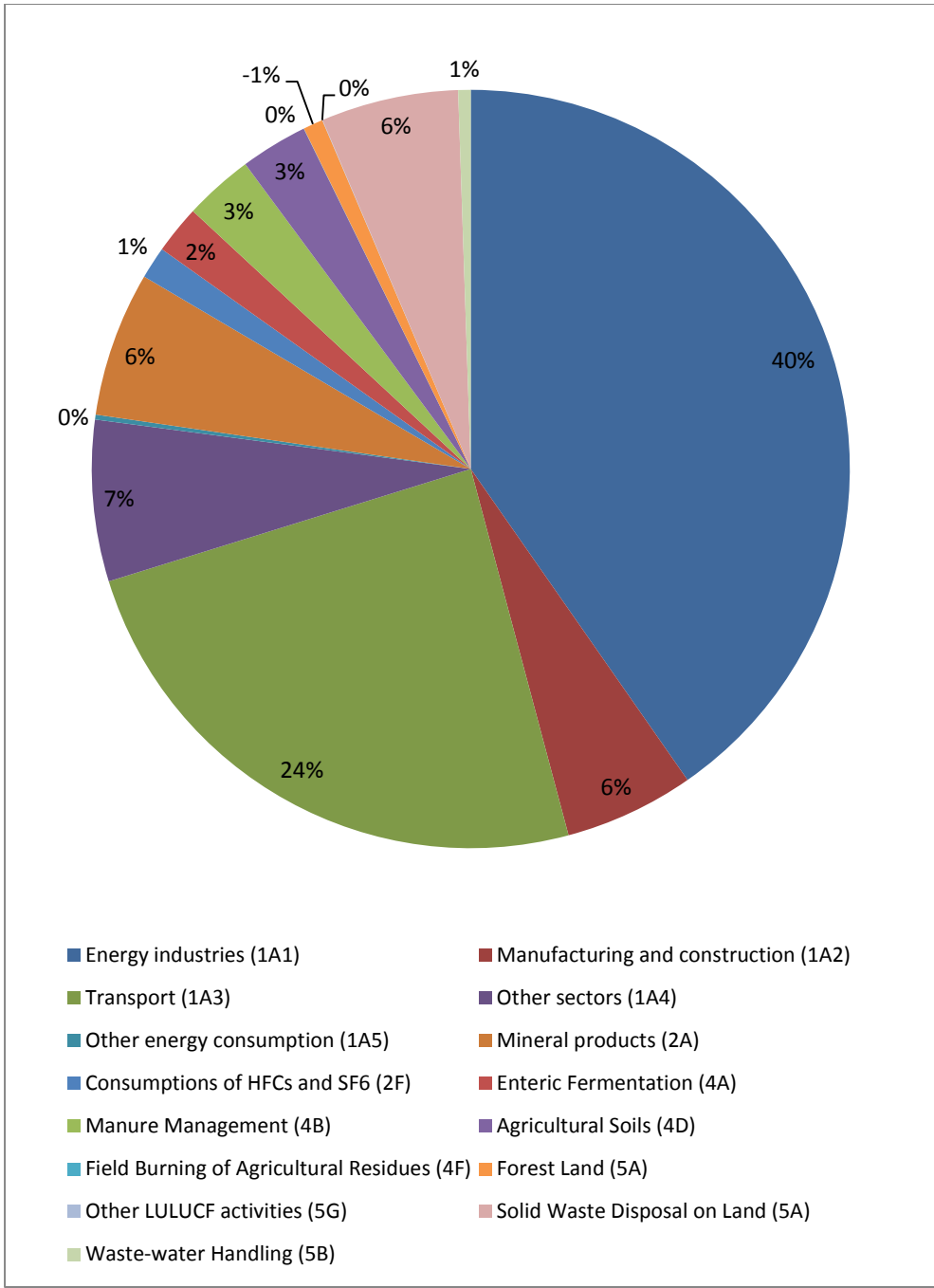


Figure 4. Contribution of sources to the total used for the “Without measures” scenario

3.1.2. EMISSIONS PER GAS

The emissions per gas were estimated using the contribution of each gas to the total of each source for the year 2011 according to the inventory report of 2013 presented in Table 20.

Table 20. Contribution of gases to total of source used for the projections

	CO ₂	CH ₄	N ₂ O	HFCs
Energy industries (1A1)	99.7%	0.08%	0.2%	
Manufacturing and construction (1A2)	99.6%	0.1%	0.3%	
Transport (1A3)	99.3%	0.4%	0.3%	
Other sectors (1A4)	99.0%	0.6%	0.3%	
Other energy consumption (1A5)	99.1%	0.6%	0.3%	
Mineral products (2A)	100%			
Consumptions of HFCs and SF6 (2F)				100%
Enteric Fermentation (4A)		100%		
Manure Management (4B)		45.2%	54.8%	
Agricultural Soils (4D)			100%	
Field Burning of Agricultural Residues (4F)		52.7%	47.3%	
Forest Land (5A)	121%	-2.2%	-18.8%	
Other LULUCF activities (5G)	100%			
Solid Waste Disposal on Land (5A)		100%		
Waste-water Handling (5B)		51.4%	48.6%	

3.1.3. EU ETS AND NON-EU ETS

Figure 5 and Table 21 presents the Without measures breakdown for ETS and non-ETS emissions. There is a small difference in the historic data of ETS between the national inventory report and CITL, due to summation of the fuels and emissions of the installations.

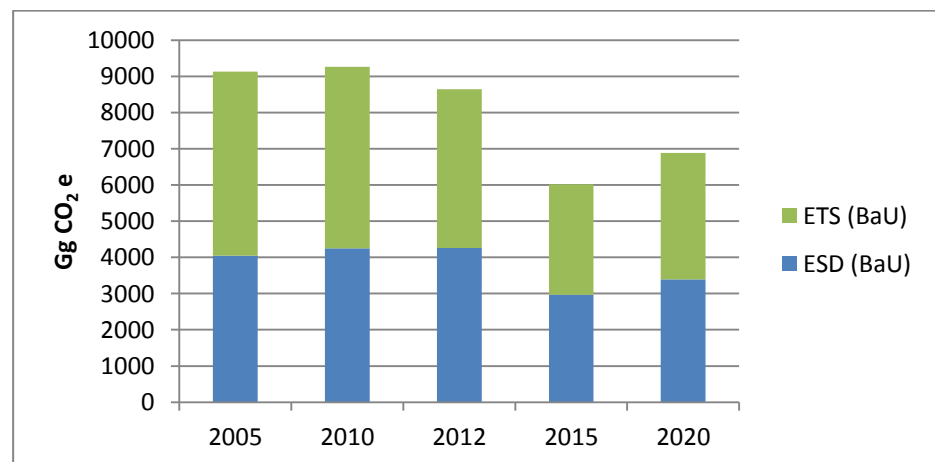


Figure 5. ETS and non-ETS emissions according to the Without measures

To estimate the ETS and non-ETS emissions the following assumptions and parameters have been taken into account:

- (a) The emissions for ETS for 2005-2009 are according to the verified reports submitted to the competent authority annually.
- (b) Data for the CO₂ projections for electricity production until 2020 is available.
- (c) The contribution of the emissions from the ETS for 2010-2020 assumed to have the same contribution to the total as 2011.
- (d) The non-ETS emissions are the remaining emissions when ETS emissions are subtracted from the total emissions.

Table 21. ETS and non-ETS emissions according to the Without measures

	2005	2010	2012	2015	2020
ETS					
Energy industries (1A1)	3472	3868	3546	2467	2821
Manufacturing and construction (1A2)	726	573	315	219	251
Transport (1A3)					
Residential & tertiary fuel consumption					
Industry (2)	880	576	523	364	417
TOTAL	5078	5017	4384	3051	3489

ESD					
Energy industries (1A1)					
Manufacturing and construction (1A2)	182	78	171	119	137
Transport (1A3)	2043	2313	2140	1491	1705
Residential & tertiary fuel consumption	561	596	622	433	496
Industry (2)	35	66	140	97	112
TOTAL	4047	4249	4256	2966	3392

ESD (BaU)	4047	4249	4256	2966	3392
ETS (BaU)	5078	5017	4384	3051	3489
Total	9126	9266	8640	6017	6881

3.2. “WITH EXISTING MEASURES” SCENARIO

The “*With Existing Measures*” scenario includes implementation of policies and measures as shown in Table 22. The reduction in the GHG that can be achieved if the presented policies and measures are fully implemented is from 4% in 2010 to 31% in 2020. The reductions are presented by measure in Table 23. The impact of the reductions to the total emissions is shown in Figure 6.

Table 22. Policies and measures included in the “With Existing Measures” scenario

	2015	2020
A. Energy*		
1. Natural Gas		16TJ for electricity
2.1. RES-Electricity	5.5% of electricity	12.4% of electricity
2.2. RES-Heating/ cooling	0.76% of electricity 13% of thermal & cooling	0.82% of electricity 15% of thermal & cooling
2.3. RES-Transport	2.6% of transport	4.0% of transport
3.1. Savings from energy efficiency in residential buildings	12% of electricity 0.6% of thermal & cooling	24% of electricity 1.2% of thermal & cooling
3.2. Savings from energy efficiency in tertiary buildings	1.7% of electricity 0.08% of thermal & cooling	3.4% of electricity 0.18% of thermal & cooling
3.3. Savings from efficient bulbs	3.2% of electricity	2% of electricity
3.4. Savings from housing insulation	1.7% of electricity 0.08% of thermal & cooling	1.5% of electricity 0.08% of thermal & cooling
3.5. Savings in existing companies	2.1% of electricity 0.1% of thermal & cooling	1.3% of electricity 0.07% of thermal & cooling
4. Improvement of production and distribution systems	0.14% of electricity	0.12% of electricity
5. Promotion of waste to energy in industry	3.6%	3.8%
B. Transport*		
1. Promotion of public transport	1.9% of transport	4.4% of transport
2.1. Hybrid vehicles	0.047% of transport	0.044% of transport
2.2. Electric vehicles	0.002% of transport	0.002% of transport
3. Promotion of low emission vehicles	0.092% of transport	0.087% of transport
4. Promotion of replacement of vehicles	1.9% of transport	4.4% of transport
C. Waste		
1. Methane recovery	0.1 Gg CO ₂ e. reductions	0.7 Gg CO ₂ e. reductions
2. Management of	0.2 Gg CO ₂ e. reductions	0.6 Gg CO ₂ e. reductions

uncontrolled disposal sites		
3. Promotion of anaerobic digestion - sewage sludge	0.03 Gg CO ₂ e. reductions	0.05 Gg CO ₂ e. reductions
D. Agriculture		
1. Promotion of anaerobic digestion – animal waste	0.06 Gg CO ₂ e. reductions	0.085 Gg CO ₂ e. reductions

* all reductions are in fuel consumption

Table 23. Reductions with policies and measures included in the “With Existing Measures” scenario

	2015	2020
A. Energy	877	2543
1. Natural Gas		887
2.1. RES-Electricity	144	373
2.2. RES-Heating/ cooling	77.2	99
2.3. RES-Transport	39.7	69
3.1. Savings from energy efficiency in residential buildings	365	841
3.2. Savings from energy efficiency in tertiary buildings	44.8	104
3.3. Savings from efficient bulbs	85.4	60
3.4. Savings from housing insulation	45.7	45
3.5. Savings in existing companies	58.2	45
4. Improvement of production and distribution systems	3.6	4
5. Promotion of waste to energy in industry	14	16
B. Transport	61.8	156
1. Promotion of public transport	29.8	77
2.1. Hybrid vehicles	0.71	1
2.2. Electric vehicles	0.04	0
3. Promotion of low emission vehicles	1.40	2
4. Promotion of replacement of vehicles	29.8	77
C. Waste	0.19	0.69
1. Methane recovery	0.07	0.34
2. Management of uncontrolled disposal sites	0.10	0.32
3. Promotion of anaerobic digestion - sewage sludge	0.01	0.03
D. Agriculture	0.03	0.06
1. Promotion of anaerobic digestion - animal waste	0.03	0.06
TOTAL	939	2700

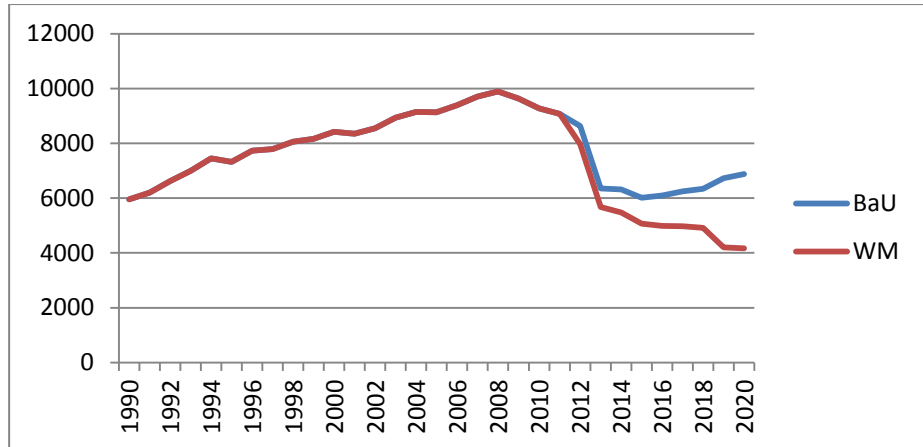


Figure 6. “With Existing Measures” (WM) projections compared to “Without measures” projections (BaU)

The GHG emissions if the WM scenario is fully implemented are shown in Table 24 for 2010, 2015 and 2020 compared to 1990, 2005 and 2009.

Table 24. Total GHG emissions for “With existing measures” including LULUCF

Year	1990	2005	2009	2010	2015	2020	
Total (Gg CO₂ eq.)	5952	9137	9629	9278	5063	4165	
	NIR 2011 (Department of Environment, 2013)				projected		
Change compared to 1990						-30%	
Change compared to 2005						-54%	
Change compared to 2009						-57%	
Change compared to 2011						-54%	
Compared to BaU						-16%	-39%

The emissions per gas (Table 25) were estimated using the contribution of each gas to the total of each source for the year 2011 according to the inventory report of 2013 presented in Table 20. The reductions by gas for each measure and the impact of the measures on the emission source by gas are presented in Table 25 and Table 26 respectively.

Table 25. Annual reduction in GHG emissions per measure of the “With Existing Measures” scenario, Gg CO₂ e.

	2015, Gg CO ₂ eq.			
	CO ₂	CH ₄	N ₂ O	TOTAL
A. Energy	874	1.5	2.2	877
1. Natural Gas				
2.1. RES-Electricity	144	0.12	0.34	144
2.2. RES-Heating/ cooling	77	0.38	0.24	77.2
2.3. RES-Transport	39	0.16	0.11	39.7
3.1. Savings from energy efficiency in residential buildings	363	0.56	0.92	365
3.2. Savings from energy efficiency in tertiary buildings	45	0.04	0.11	44.8
3.3. Savings from efficient bulbs	85	0.07	0.20	85.4
3.4. Savings from housing insulation	46	0.04	0.11	45.7
3.5. Savings in existing companies	58	0.10	0.15	58.2
4. Improvement of production and distribution systems	3.6	0.003	0.01	3.6
5. Promotion of waste to energy in industry	14	0.02	0.04	14.0
B. Transport	61	0.24	0.16	61.8
1. Promotion of public transport	30	0.12	0.08	29.8
2.1. Hybrid vehicles	0.7	0.003	0.002	0.71
2.2. Electric vehicles	0.04	0.0001	0.0001	0.04
3. Promotion of low emission vehicles	1.4	0.01	0.004	1.40
4. Promotion of replacement of vehicles	30	0.12	0.08	29.8
C. Waste		0.18	0.01	0.19
1. Methane recovery		0.07		0.07
2. Management of uncontrolled disposal sites		0.10		0.10
3. Promotion of anaerobic digestion - sewage sludge		0.01	0.01	0.01
D. Agriculture		0.01	0.02	0.03
1. Promotion of anaerobic digestion - animal waste		0.01	0.02	0.03
TOTAL	935	1.9	2.4	939
	2015, Gg CO ₂ eq.			
	CO ₂	CH ₄	N ₂ O	TOTAL
A. Energy	874	1.5	2.2	877
1. Natural Gas				
2.1. RES-Electricity	144	0.12	0.34	144
2.2. RES-Heating/ cooling	77	0.38	0.24	77.2
2.3. RES-Transport	39	0.16	0.11	39.7
3.1. Savings from energy efficiency in residential buildings	363	0.56	0.92	365
3.2. Savings from energy efficiency in tertiary buildings	45	0.04	0.11	44.8

3.3. Savings from efficient bulbs	85	0.07	0.20	85.4
3.4. Savings from housing insulation	46	0.04	0.11	45.7
3.5. Savings in existing companies	58	0.10	0.15	58.2
4. Improvement of production and distribution systems	3.6	0.003	0.01	3.6
5. Promotion of waste to energy in industry	14	0.02	0.04	14.0
B. Transport	61	0.24	0.16	61.8
1. Promotion of public transport	30	0.12	0.08	29.8
2.1. Hybrid vehicles	0.7	0.003	0.002	0.71
2.2. Electric vehicles	0.04	0.0001	0.0001	0.04
3. Promotion of low emission vehicles	1.4	0.01	0.004	1.40
4. Promotion of replacement of vehicles	30	0.12	0.08	29.8
C. Waste		0.18	0.01	0.19
1. Methane recovery		0.07		0.07
2. Management of uncontrolled disposal sites		0.10		0.10
3. Promotion of anaerobic digestion - sewage sludge		0.01	0.01	0.01
D. Agriculture		0.01	0.02	0.03
1. Promotion of anaerobic digestion - animal waste		0.01	0.02	0.03
TOTAL	935	1.9	2.4	939

Table 26. Reduction in emissions by source with the “With Existing Measures” scenario, Gg CO₂ e.

	2015, Gg CO ₂ eq.				
	CO ₂	CH ₄	N ₂ O	HFCs	TOTAL
Energy industries (1A1)	1753	1.4	4.2		1758
Manufacturing and construction (1A2)	324	0.4	0.9		325
Transport (1A3)	1381	5.4	3.7		1390
Other sectors (1A4)	289	1.9	1.0		292
Other energy consumption (1A5)	13	0.1	0.04		13
Mineral products (2A)	378				378
Consumptions of HFCs and SF6 (2F)				84	84
Enteric Fermentation (4A)		126			126
Manure Management (4B)		82	99		181
Agricultural Soils (4D)			176		176
Field Burning of Agricultural Residues (4F)		0.4	0.3		1
Forest Land (5A)	-63	1.1	9.7		-52
Other LULUCF activities (5G)	1.0				1
Solid Waste Disposal on Land (6A)		359			359
Waste-water Handling (6B)		17	16		33
TOTAL	4075	594	311	84	5063

	2020, Gg CO ₂ eq.				
	CO ₂	CH ₄	N ₂ O	HFCs	TOTAL
Energy industries (1A1)	560	0.5	1.3		562
Manufacturing and construction (1A2)	370	0.4	1.1		371
Transport (1A3)	1471	5.8	3.9		1481

Other sectors (1A4)	264	1.7	0.9		266
Other energy consumption (1A5)	14	0.1	0.0		15
Mineral products (2A)	432				432
Consumptions of HFCs and SF6 (2F)				96	96
Enteric Fermentation (4A)		144			144
Manure Management (4B)		94	113		207
Agricultural Soils (4D)			201.1		201
Field Burning of Agricultural Residues (4F)		0.4	0.4		0.8
Forest Land (5A)	-72	1.3	11.1		-59
Other LULUCF activities (5G)	1.1				1.1
Solid Waste Disposal on Land (6A)		410			410
Waste-water Handling (6B)		19	18		37
TOTAL	3041	677	351	96	4165

3.2.1. SENSITIVITY ANALYSIS

The change in total of “*With Existing Measures*” scenario at 1% change of each measure is presented in Table 27 for 2015 and 2020. Figure 7 presents the impact of the measures schematically.

Table 27. Change in total of “With Existing Measures” scenario at 1% change of each measure

	2015	2020
A. Energy	0.00%	0.34%
1. Natural Gas	0.16%	0.14%
2.1. RES-Electricity	0.02%	0.01%
2.2. RES-Heating/ cooling	0.06%	0.03%
2.3. RES-Transport	0.04%	0.026%
3.1. Savings from energy efficiency in residential buildings	0.349%	0.2766%
3.2. Savings from energy efficiency in tertiary buildings	0.05%	0.04%
3.3. Savings from efficient bulbs	0.049%	0.0395%
3.4. Savings from housing insulation	0.000%	0.0003%
3.5. Savings in existing companies	0.09%	0.02%
4. Improvement of production and distribution systems	0.05%	0.02%
5. Promotion of waste to energy in industry	0.00%	0.34%
B. Transport		
1. Promotion of public transport	0.0004%	0.0001%
2.1. Hybrid vehicles	0.0537%	0.0144%
2.2. Electric vehicles	0.0104%	0.0026%
3. Promotion of low emission vehicles	0.0039%	0.0014%
4. Promotion of replacement of vehicles	0.02%	0.01%
C. Waste	0.0328%	0.0293%
1. Methane recovery	0.00%	0.00%
2. Management of uncontrolled disposal sites	0.00%	0.00%
3. Promotion of anaerobic digestion - sewage sludge	0.03%	0.03%
D. Agriculture		
1. Promotion of anaerobic digestion - animal waste	0.001%	0.0003%

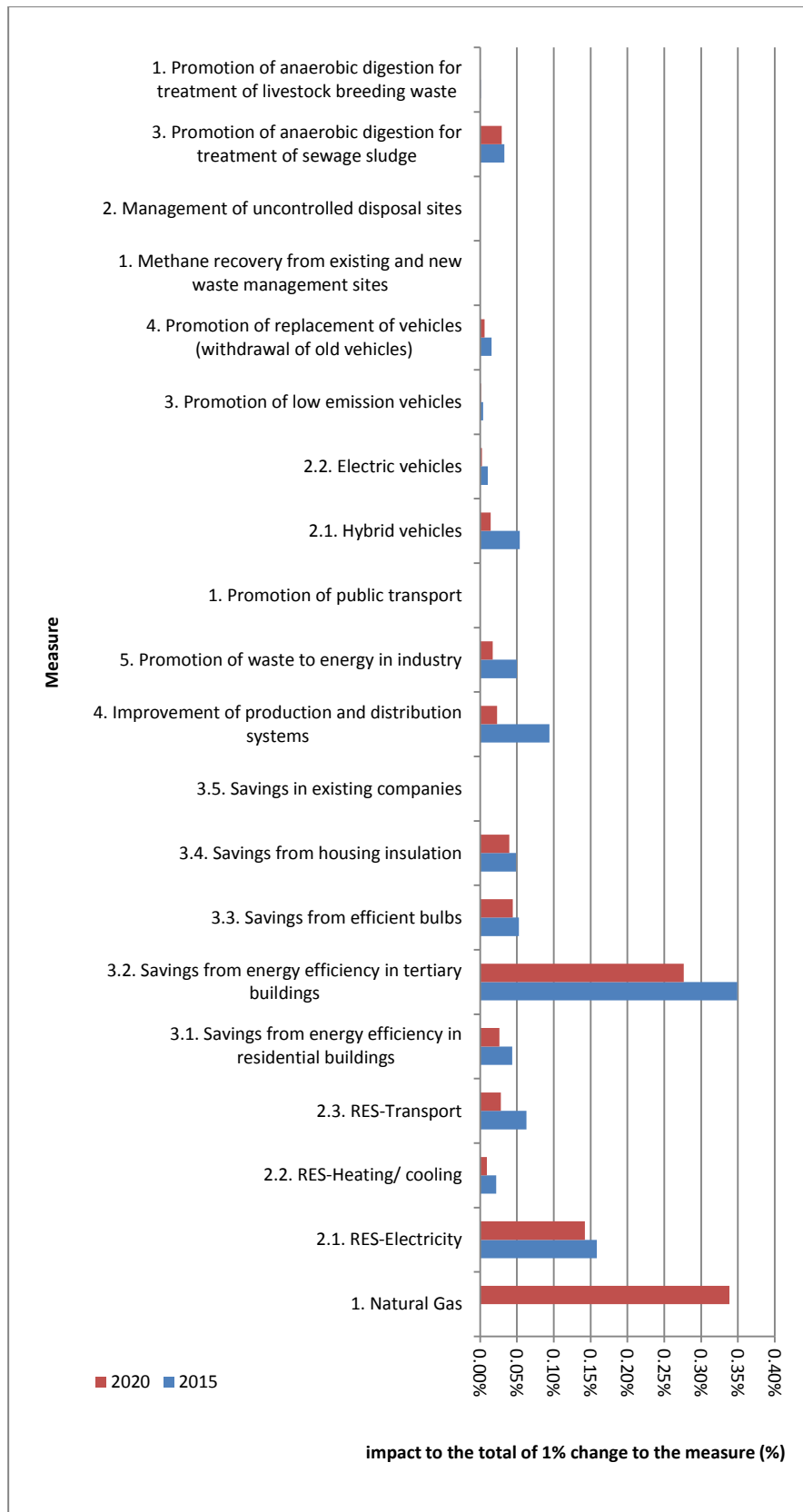


Figure 7. Change in total emissions of “With Existing Measures” scenario at 1% change of each measure

3.2.2. EU ETS AND NON-EU ETS

ETS and non-ETS emissions for the “*With Existing Measures*” scenario are presented in Table 28 and Figure 8.

Table 28. ETS and non-ETS emissions according to the “*With Existing Measures*” scenario

ETS data (2005-2012) & projection (2013-2020)					
	2005	2010	2012	2015	2020
Energy industries (1A1)	3472	3868	3546	1758	562
Manufacturing and construction (1A2)	726	573	315	219	250
Transport (1A3)					
1A4+1A5					
Industry (2)	880	576	523	364	417
TOTAL	5078	5017	4384	2342	1229
Non-ETS					
	2005	2010	2012	2015	2020
Energy industries (1A1)					
Manufacturing and construction (1A2)	182	78	152	106	121
Transport (1A3)	2043	2313	2070	1390	1481
1A4+1A5	561	596	497	304	281
Industry (2)	35	66	140	97	112
TOTAL	4047	4249	4042	2722	2936
ESD (WM)	4047	4249	4042	2722	2936
ETS (WM)	5078	5017	4384	2342	1229
Total	9126	9266	8426	5063	4165

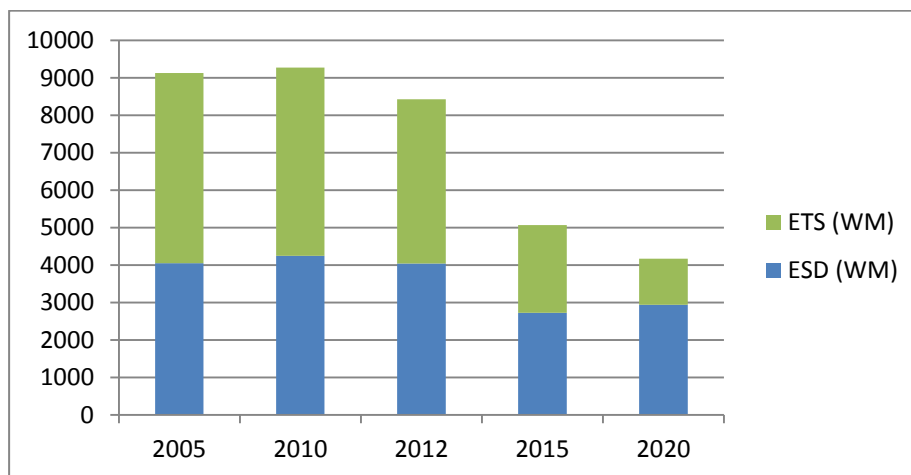


Figure 8. ETS and non-ETS emissions according to the “*With Existing Measures*” scenario

3.3. “WITH ADDITIONAL MEASURES” SCENARIO

The “*With Additional Measures*” scenario includes implementation of policies and measures as shown in Table 29. The reduction in the GHG that can be achieved if the presented policies and measures are fully implemented is from 6% in 2010 to 51% in 2020 compared to the “*business as usual*” scenario. The reductions per measure are presented in Table 30. The impact of the reductions to the total emissions is shown in Figure 9.

Table 29. Policies and measures included in the “With Additional Measures” scenario

	2015	2020
A. Energy*		
1. Natural Gas		16TJ for electricity
2.1. RES-Electricity	8.4% of electricity	16% of electricity
2.2. RES-Heating/ cooling	0.8% of electricity 14% of thermal & cooling	0.9% of electricity 16% of thermal & cooling
2.3. RES-Transport	2.96% of transport	4.76% of transport
3.1. Savings from energy efficiency in residential buildings	20% of electricity 0.9% of thermal & cooling	33% of electricity 1.7% of thermal & cooling
3.2. Savings from energy efficiency in tertiary buildings	8% of electricity 0.4% of thermal & cooling	15% of electricity 0.8% of thermal & cooling
3.3. Savings from efficient bulbs	3.7% of electricity	1.8% of electricity
3.4. Savings from housing insulation	3.0% of electricity 0.14% of thermal & cooling	3.6% of electricity 0.18% of thermal & cooling
3.5. Savings in existing companies	3.5% of electricity 0.2% of thermal & cooling	3.2% of electricity 0.2% of thermal & cooling
4. Improvement of production and distribution systems	0.1% of electricity	0.1% of electricity
5. Promotion of waste to energy in industry	4.1%	4.3%
B. Transport*		
1. Promotion of public transport	6% of transport	11% of transport
2.1. Hybrid vehicles	0.047% of transport	0.044% of transport
2.2. Electric vehicles	0.002% of transport	0.002% of transport
3. Promotion of low emission vehicles	0.092% of transport	0.087% of transport
4. Promotion of replacement of vehicles	6% of transport	11% of transport
C. Waste		
1. Methane recovery	0.1 Gg CO2 e. reductions	0.8 Gg CO2 e. reductions
2. Management of uncontrolled disposal sites	0.3 Gg CO2 e. reductions	0.7 Gg CO2 e. reductions

3. Promotion of anaerobic digestion - sewage sludge	0.06 Gg CO2 e. reductions	0.11 Gg CO2 e. reductions
D. Agriculture		
1. Promotion of anaerobic digestion – animal waste	0.12 Gg CO2 e. reductions	0.17 Gg CO2 e. reductions

* all reductions are in fuel consumption

Table 30. Reductions with policies and measures included in the “With Additional Measures” scenario

	2015	2020
A. Energy	986	2870
1. Natural Gas		887
2.1. RES-Electricity	144	373
2.2. RES-Heating/ cooling	77	99
2.3. RES-Transport	40	69
3.1. Savings from energy efficiency in residential buildings	347	808
3.2. Savings from energy efficiency in tertiary buildings	131	361
3.3. Savings from efficient bulbs	85	60
3.4. Savings from housing insulation	66	96
3.5. Savings in existing companies	80	97
4. Improvement of production and distribution systems	2.5	2.8
5. Promotion of waste to energy in industry	14.17	16.45
B. Transport	121	975
1. Promotion of public transport	60	153
2.1. Hybrid vehicles	0.7	0.8
2.2. Electric vehicles	0.04	0.04
3. Promotion of low emission vehicles	1.40	1.51
4. Promotion of replacement of vehicles	60	153
5. Additional measures		665
C. Waste	0.24	0.84
1. Methane recovery	0.07	0.38
2. Management of uncontrolled disposal sites	0.14	0.39
3. Promotion of anaerobic digestion - sewage sludge	0.03	0.07
D. Agriculture	0.06	0.12
1. Promotion of anaerobic digestion – animal waste	0.06	0.12
TOTAL	1108	3845

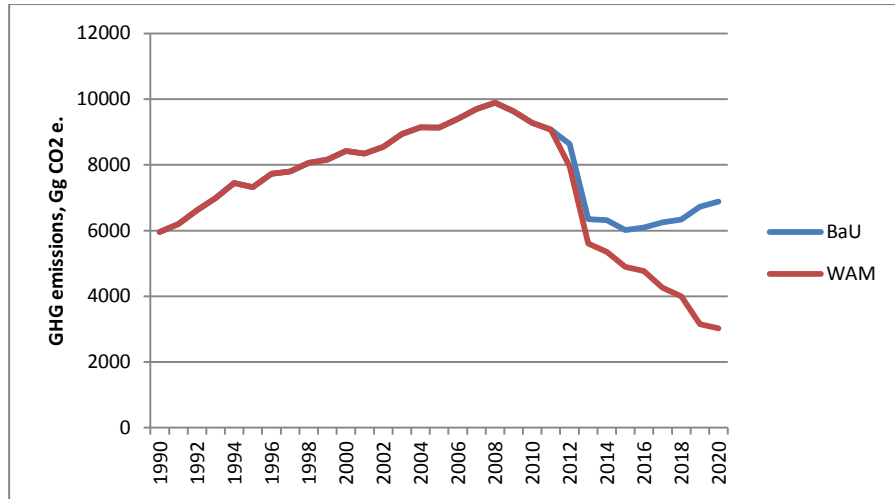


Figure 9. “With Additional Measures” (WAM) projections compared to “Without measures” projections (BaU)

The GHG emissions if the WAM scenario is fully implemented are shown in Table 31 for 2010, 2015 and 2020 compared to 1990, 2000, 2005 and 2009.

Table 31. Total GHG emissions for “With additional measures” including LULUCF

Year	1990	2005	2009	2010	2015	2020	
Total (Gg CO₂ eq.)	5952	9137	9629	9278	4895	3019	
	NIR 2011 (Department of Environment, 2013)				projected		
Change compared to 1990						-49%	
Change compared to 2005						-67%	
Change compared to 2009						-69%	
Change compared to 2011						-67%	
Compared to BaU						-50%	-52%

The emissions per gas (Table 32) were estimated using the contribution of each gas to the total of each source for the year 2011 according to the inventory report of 2013 presented in Table 20. The reductions by gas for each measure and the impact of the measures on the emission source by gas are presented in Table 32 and Table 33 respectively.

Table 32. Annual reduction in GHG emissions per measure of the “With Additional Measures” scenario, Gg CO₂ e.

	2015, Gg CO ₂ eq.			
	CO ₂	CH ₄	N ₂ O	TOTAL
A. Energy	982	1.3	2.4	986
1. Natural Gas				
2.1. RES-Electricity	144	0.12	0.34	144
2.2. RES-Heating/ cooling	77	0.38	0.24	77
2.3. RES-Transport	39	0.16	0.11	40
3.1. Savings from energy efficiency in residential buildings	346	0.30	0.83	347
3.2. Savings from energy efficiency in tertiary buildings	130	0.11	0.31	131
3.3. Savings from efficient bulbs	85	0.07	0.20	85
3.4. Savings from housing insulation	66	0.06	0.16	66
3.5. Savings in existing companies	79	0.07	0.19	80
4. Improvement of production and distribution systems	2.5	0.002	0.01	2.5
5. Promotion of waste to energy in industry	14.1	0.02	0.04	14.17
B. Transport	121	0.48	0.32	121
1. Promotion of public transport	59	0.23	0.16	60
2.1. Hybrid vehicles	0.7	0.003	0.002	0.7
2.2. Electric vehicles	0.04	0.0001	0.0001	0.04
3. Promotion of low emission vehicles	1.4	0.006	0.004	1.40
4. Promotion of replacement of vehicles	59	0.23	0.16	60
5. Additional measures				
C. Waste		0.23	0.01	0.24
1. Methane recovery		0.07		0.07
2. Management of uncontrolled disposal sites		0.14		0.14
3. Promotion of anaerobic digestion - sewage sludge		0.01	0.01	0.03
D. Agriculture		0.03	0.03	0.06
1. Promotion of anaerobic digestion - animal waste		0.03	0.03	0.06
TOTAL	1103	2.0	2.8	1108
	2015, Gg CO ₂ eq.			
	CO ₂	CH ₄	N ₂ O	TOTAL
A. Energy	2860	3.0	7.0	2870
1. Natural Gas	884	0.7	2.1	887
2.1. RES-Electricity	372	0.3	0.9	373
2.2. RES-Heating/ cooling	98	0.5	0.3	99
2.3. RES-Transport	69	0.3	0.2	69
3.1. Savings from energy efficiency in residential buildings	805	0.7	1.9	808

3.2. Savings from energy efficiency in tertiary buildings	360	0.3	0.9	361
3.3. Savings from efficient bulbs	60	0.05	0.14	60
3.4. Savings from housing insulation	96	0.1	0.2	96
3.5. Savings in existing companies	97	0.1	0.2	97
4. Improvement of production and distribution systems	2.8	0.002	0.01	2.8
5. Promotion of waste to energy in industry	16.4	0.02	0.05	16.45
B. Transport	968	3.8	2.6	975
1. Promotion of public transport	152	0.6	0.4	153
2.1. Hybrid vehicles	0.8	0.0	0.0	0.8
2.2. Electric vehicles	0.04	0.0002	0.0001	0.04
3. Promotion of low emission vehicles	1.50	0.01	0.004	1.51
4. Promotion of replacement of vehicles	152	0.6	0.4	153
5. Additional measures	661	2.6	1.8	665
C. Waste		0.81	0.03	0.84
1. Methane recovery		0.38		0.38
2. Management of uncontrolled disposal sites		0.39		0.39
3. Promotion of anaerobic digestion - sewage sludge		0.03	0.03	0.07
D. Agriculture		0.05	0.07	0.12
1. Promotion of anaerobic digestion - animal waste		0.05	0.07	0.12
TOTAL	3828	7.7	9.7	3845

Table 33. Reduction in emissions by source with the “With Additional Measures” scenario, Gg CO₂ e.

	2015, Gg CO ₂ eq.				
	CO ₂	CH ₄	N ₂ O	HFCs	TOTAL
Energy industries (1A1)	1592	1.29	3.82		1597
Manufacturing and construction (1A2)	323	0.36	0.94		325
Transport (1A3)	1321	5.21	3.54		1330
Other sectors (1A4)	341	2.19	1.14		344
Other energy consumption (1A5)	13	0.07	0.04		13
Mineral products (2A)	378				378
Consumptions of HFCs and SF6 (2F)				84	84
Enteric Fermentation (4A)		126			126
Manure Management (4B)		82	99		181
Agricultural Soils (4D)			176		176
Field Burning of Agricultural Residues (4F)		0.35	0.32		0.67
Forest Land (5A)	-63	1.13	10		-52
Other LULUCF activities (5G)	0.97				0.97
Solid Waste Disposal on Land (6A)		359			359
Waste-water Handling (6B)		17	16		33
TOTAL	3907	594	310	84	4895

	2020, Gg CO ₂ eq.				
	CO ₂	CH ₄	N ₂ O	HFCs	TOTAL
Energy industries (1A1)	122	0.10	0.29		123
Manufacturing and construction (1A2)	370	0.41	1.07		371
Transport (1A3)	657	2.59	1.76		662
Other sectors (1A4)	375	2.41	1.25		379
Other energy consumption (1A5)	14	0.08	0.04		15
Mineral products (2A)	432				432
Consumptions of HFCs and SF6 (2F)				96	96
Enteric Fermentation (4A)		144			144
Manure Management (4B)		94	113		207
Agricultural Soils (4D)			201		201
Field Burning of Agricultural Residues (4F)		0.40	0.36		0.77
Forest Land (5A)	-72	1.29	11		-59
Other LULUCF activities (5G)	1.11				1.11
Solid Waste Disposal on Land (6A)		410			410
Waste-water Handling (6B)		19	18		37
TOTAL	1901	674	349	96	3019

3.3.1. SENSITIVITY ANALYSIS

The change in total of “*With Additional Measures*” scenario at 1% change of each measure is presented in Table 34 for 2010, 2015 and 2020. Figure 10 presents the impact of the measures schematically.

Table 34. Change in total of “With Additional Measures” scenario at 1% change of each measure

	2015	2020
A. Energy		
1. Natural Gas	0.00%	0.29%
2.1. RES-Electricity	0.14%	0.12%
2.2. RES-Heating/ cooling	0.02%	0.01%
2.3. RES-Transport	0.05%	0.02%
3.1. Savings from energy efficiency in residential buildings	0.04%	0.02%
3.2. Savings from energy efficiency in tertiary buildings	0.33%	0.26%
3.3. Savings from efficient bulbs	0.00%	0.00%
3.4. Savings from housing insulation	0.124%	0.118%
3.5. Savings in existing companies	0.001%	0.001%
4. Improvement of production and distribution systems	0.0816%	0.0199%
5. Promotion of waste to energy in industry	0.062%	0.032%
B. Transport		
1. Promotion of public transport	0.00%	0.00%
2.1. Hybrid vehicles	0.07547%	0.03191%
2.2. Electric vehicles	0.0006%	0.0003%
3. Promotion of low emission vehicles	0.0024%	0.0009%
4. Promotion of replacement of vehicles (withdrawal of old vehicles)	0.01%	0.01%
5. Savings from additional energy efficiency measures in transport	0.00%	0.00%
C. Waste		
1. Methane recovery from existing and new waste management sites	0.00%	0.00%
2. Management of uncontrolled disposal sites	0.06%	0.05%
3. Promotion of anaerobic digestion for treatment of sewage sludge		
D. Agriculture		
1. Promotion of anaerobic digestion for treatment of livestock breeding waste	0.001%	0.000%

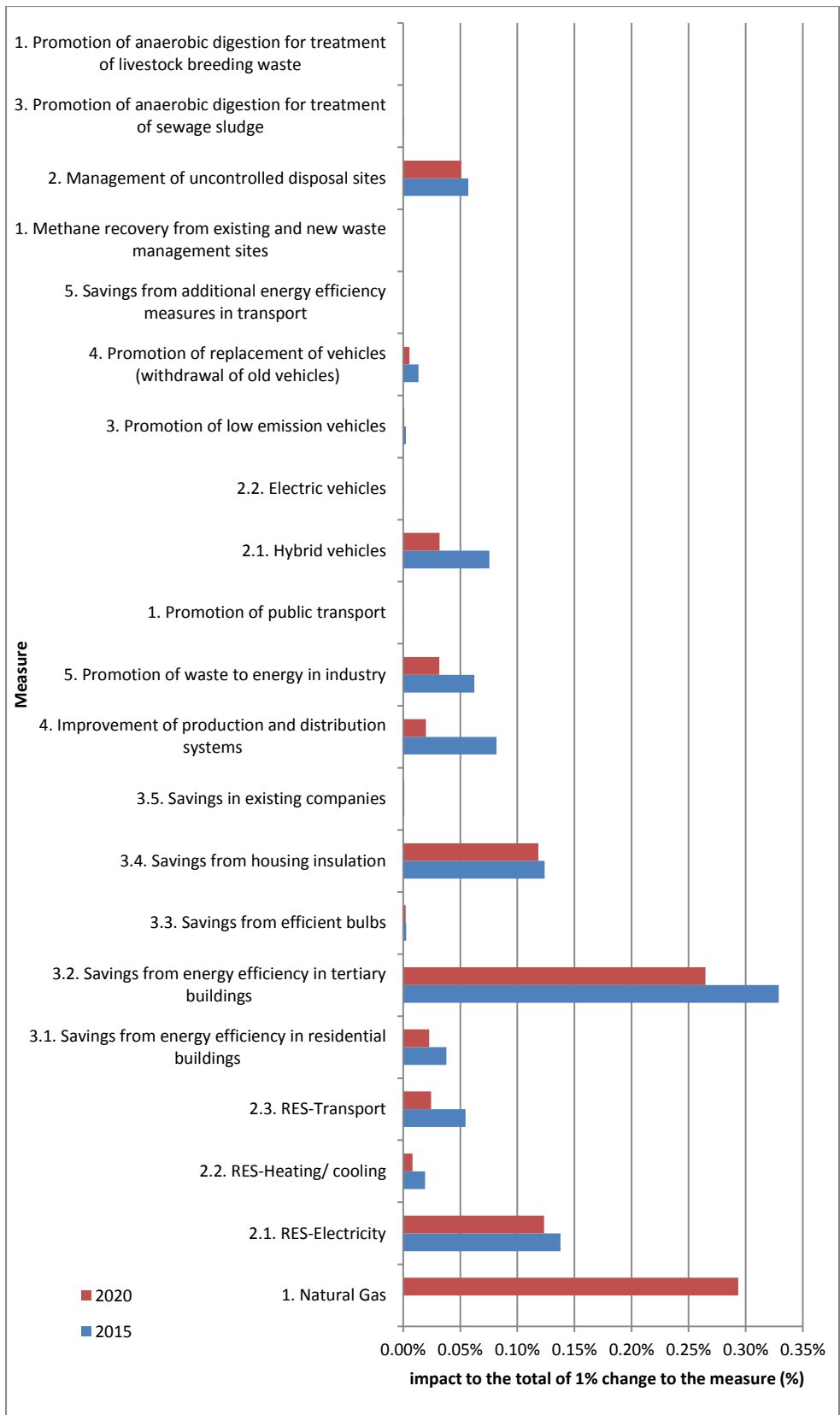


Figure 10. Change in total of “With Additional Measures” scenario at 1% change of each measure

3.3.2. EU ETS AND NON-EU ETS

ETS and non-ETS emissions for the “With Additional Measures” scenario are presented in Table 35 and Figure 11.

Table 35. ETS and non-ETS emissions according to the “With Additional Measures” scenario

ETS data (2005-2012) & projection (2013-2020)					
	2005	2010	2012	2015	2020
Energy industries (1A1)	3472	3868	3546	1597	123
Manufacturing and construction (1A2)	726	573	315	219	250
Transport (1A3)					
1A4+1A5					
Industry (2)	880	576	523	364	417
TOTAL	5078	5017	4384	2181	790
Non-ETS					
	2005	2010	2012	2015	2020
Energy industries (1A1)					
Manufacturing and construction (1A2)	182	78	152	106	121
Transport (1A3)	2043	2313	2048	1330	662
1A4+1A5	561	596	527	357	394
Industry (2)	35	66	140	97	112
TOTAL	4047	4249	4050	2715	2230
ESD (WM)	4047	4249	4050	2715	2230
ETS (WM)	5078	5017	4384	2181	790
Total	9126	9266	8434	4895	3019

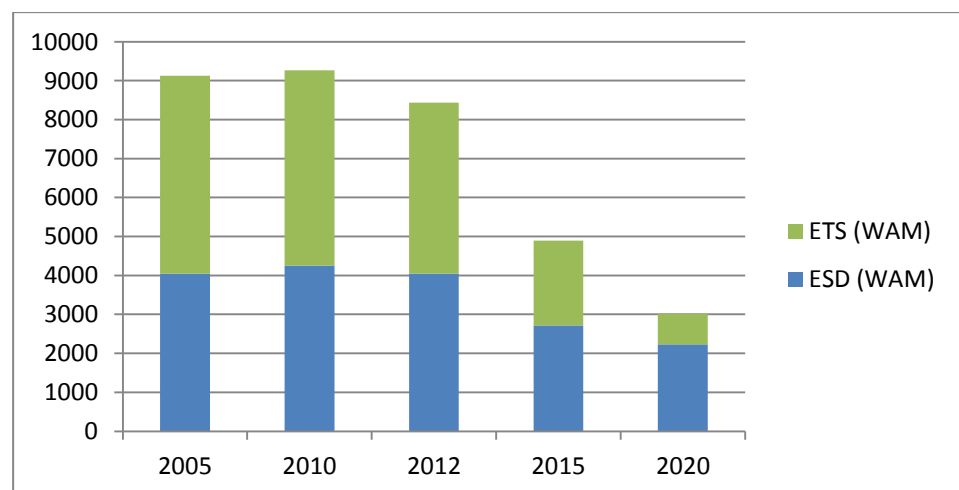


Figure 11. ETS and non-ETS emissions according to the “With Additional Measures” scenario

3.4. “WITH EXISTING MEASURES” AND “WITH ADDITIONAL MEASURES” SCENARIOS

Table 36 and Figure 12 present the comparison of the two scenarios to the Without measures.

Table 36. “With Existing Measures” and “With Additional Measures” scenarios compared to Without measures

	Without measures	With Existing Measures	With Additional measures
1990	5952		
2000	8424		
2005	9137		
2010	9278	9811	9784
2011	9078		
2015	6017	5063	4895
2020	6881	4165	3019
2020 compared to 1990	16%	-30%	-49%
Compared to Without measures (2020)		-39%	-56%

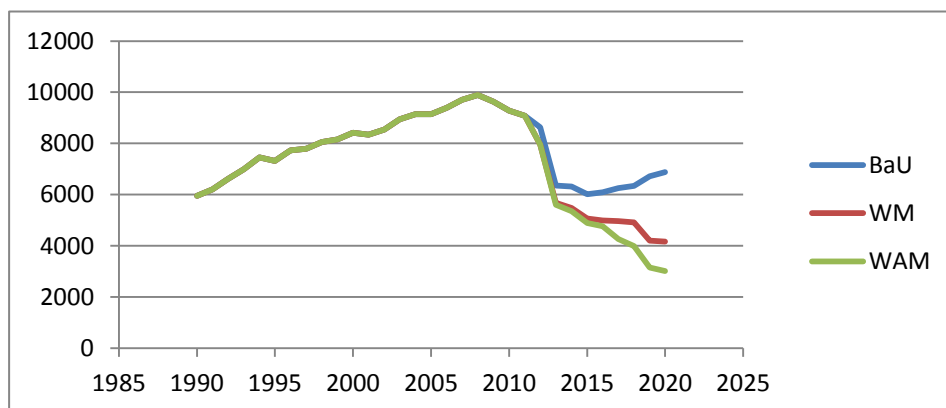


Figure 12. “With Existing Measures” (WM) and “With Addition Measures” (WAM) scenarios compared to Without measures (BaU)

3.5. 2005/166/EC 9(C): INDICATORS FOR PROJECTIONS (ANNEX III)

Indicators for projections for which data is available, have been submitted only the excel template.

3.6. 2005/166/EC 10(2): PARAMETERS FOR PROJECTIONS (ANNEX IV)

Parameters for projections which have been used for projections, have been submitted only the excel template.

4. INTERNATIONAL COMMITMENTS

4.1. ARTICLE 3(2)(C) COMMUNITY LEGISLATION AND POLICIES

Please refer to Chapter 2 for details.

4.1.1. LEGAL AND INSTITUTIONAL STEPS FOR IMPLEMENTATION OF COMMITMENTS

Please refer to Chapter 2 for details.

4.2. KYOTO PROTOCOL

N/A for period 2008-2012

4.2.1. PARTICIPATION OF LEGAL ENTITIES

N/A for period 2008-2012

4.3. QUESTIONNAIRE ON THE USE OF THE KYOTO PROTOCOL MECHANISMS IN MEETING THE 2008-2012 TARGETS (DECISION 2005/166/EC, ANNEX V)

1. *Does your Member State intend to use joint implementation (JI), the clean development mechanism (CDM) and international emissions trading (IET) under the Kyoto Protocol (the Kyoto mechanisms) to meet its quantified emission limitation or reduction commitment pursuant to Article 2 of Decision 2002/358/EC and the Kyoto Protocol? If so, what progress has been made with the implementing provisions (operational programmes, institutional decisions) and any related domestic legislation?*

Not applicable; Cyprus was a non - Annex I party to the UNFCCC during the first commitment period.

2. *Has your Member State established and notified to the UNFCCC a designated national authority for clean development mechanism projects and a designated focal point for joint implementation projects? If so, please provide details.*

Cyprus has designated the Department of Environment as competent authority for clean development mechanism projects. Responsible person is Dr. Theodoulos Mesimeris (tmesimeris@environment.moa.gov.cy, tel: +357 22 408948).

3. *Which of the three Kyoto mechanisms is your Member State using or does it plan to use?*

Not applicable; Cyprus was a non - Annex I party to the UNFCCC during the first commitment period. For the second commitment period: not yet known.

4. *What quantitative contributions to the fulfilment of the quantified emission limitation or reduction commitment pursuant to Article 2 of Decision 2002/358/EC and the Kyoto Protocol does your Member State expect from the Kyoto mechanisms during the first quantified emission limitation and reduction commitment period, from 2008 to 2012 (please use Table 1)?*

Not applicable.

5. *Specify the budget in euro for the total use of the Kyoto mechanisms and, where possible, per mechanism and initiative, programme or fund, including the time over which the budget will be spent.*

Not applicable.

6. *With which countries has your Member State closed bilateral or multilateral agreements, or agreed memorandums of understanding or contracts for the implementation of project based activities?*

Not applicable.

7. *For each planned, ongoing and completed clean development mechanism and joint implementation project activity in which your Member State participates, provide the following information (Table 37)*

Cyprus is a non-Annex I country and therefore can host CDM projects. Table 37 presents the projects for which project design documents have been approved by the competent authority. The projects fall within the categories of energy and agriculture. It should be noted that:

- host country is replaced in the table by Annex I country involved;
- category is for all projects CDM
- first/ second track approval is not included – no JI projects

It should be noted that all information are according to the project design documents submitted to the national competent authority.

Table 38 presents the annual estimation of emission reductions (tCO₂ eq./year) according to the PDD submitted to the Cyprus DNA.

Note: even though the projects have been registered, no allowances will be issued after 31/12/2012, the date after which Cyprus became an Annex I to the UNFCCC and a KP party.

Table 37. CDM projects for which PDDs have been approved by the Competent Authority to be hosted in Cyprus

CDM PROJECT	(a) Project Title	Annex I country involved	(c) Financing	(d) Project type	(e) Status	(f) Lifetime	(h) Projected total emissions reduction that accrue until the end of the first commitment	(i) Amount of ERUs or CERS generated	(j) Credits accrued until the end of 2009	Registration to UNFCCC	Reductions as stated by the project participants (CO2 equivalent per annum)	UNFCCC reference number
1	Anaerobic digestion at Armenis Farm Ltd	The Netherlands	Private	Agriculture	Under construction (construction phase)	PDD submitted: 29/01/08 Letter of approval: 02/05/08 Start of operation: 01/05/08 Project termination: 2018 Crediting period: from 01/07/08 Date of issue: NA	73,166	2008: 7,71 2009: 15,552 2010: 16,280 2011: 16,768 2012: 17,095 2013: 17,315 2014: 17,462 2015: 17,560 2016: 17,626 2017: 17,670 2018: 11,277 Total: 172,076	None	12/06/2009	10767	2334
2	Wind Park at Orites Archimandritas		Private	Energy and power	Under construction (construction)	PDD submitted: Letter of approval: 08/01/08 Start of operation: 01/01/10 Project termination: 2019 Crediting period: from 01/01/10 Date of issue: NA	702,444	234,148/ year 10 year total: 2,341,480	None			
3	Kambi Wind Farm Project	The Netherlands	Private	Energy and power	Under construction (start up)	PDD submitted: 19/11/08 Letter of approval: 21/11/08 Start of operation: 01/01/10 Project termination: 2019 Crediting period: from 01/01/10 Date of issue: NA	38,100	12,700/ year 10 year total: 12,7001	None			
4	30 MW TSP Aeolian Dynamics Wind Power Project	The Netherlands	Private	Energy and power	Under construction (start up)	PDD submitted: 22/01/09 Letter of approval: 26/01/09 Start of operation: 01/01/11 Project termination: 2020 Crediting period: from 01/01/11 Date of issue: NA	119,706	59,853/ year 10 year total: 343,660	None			
5	Orounda Biogas plant in Cyprus	United Kingdom	Private	Agriculture	Under construction (start up)	PDD submitted: 06/04/09 Letter of approval: 03/07/09 Start of operation: 01/04/09 Project termination: 2020 Crediting period: from 01/11/10 Date of issue: NA	68,732	34,366/ year 10 year total: 343,660	None			

6	Animalia		Private	Agriculture	In operation	PDD submitted: Letter of approval: 21/04/2008 Start of operation: 07/2008 Project termination: 31/12/2018 Crediting period: from 1/1/2009 Date of issue: NA	48,363	12,242/ year 10 year total: 122,416	None	25/02/2009	12242	2331
7	Andreou & costi		Private	Agriculture	In operation	PDD submitted: Letter of approval: 30/10/2008 Start of operation: 07/2008 Project termination: 31/12/2018 Crediting period: from 1/1/2009 Date of issue: NA	69,896	17,474/ year 10 year total: 174,741	None	31/03/2009	17474	2329
8	Rokas Renewables		Private	Energy and power	Under construction (start up)	PDD submitted: 28/06/09 Letter of approval: 03/07/09 Start of operation: 01/08/2011 Project termination: 31/7/2021 Crediting period: from 01/08/2011 Date of issue: NA	71,106	50,007/ year 10 year total: 500,069	None			
9	Rokas Renewables		Private	Energy and power	Under construction (start up)	PDD submitted: 28/06/09 Letter of approval: 03/07/09 Start of operation: 01/02/2011 Project termination: 31/01/2021 Crediting period: from 01/02/2011 Date of issue: NA	46,659	24,364/ year 10 year total: 243,639	None			
10	A. Kailas & Sons Ltd, Cyprus					PDD submitted: 14/12/2010 Letter of approval: Start of operation: Project termination: Crediting period: from Date of issue:						
11	S.P. Lagos Farm Ltd., Cyprus					PDD submitted: 14/12/2010 Letter of approval: Start of operation: Project termination: Crediting period: from Date of issue:						
12	Christakis N. Neophytou Biogas Ltd., Cyprus					PDD submitted: 14/12/2010 Letter of approval: Start of operation: Project termination: Crediting period: from Date of issue:						

13	Ketonis, Mari					PDD submitted: 28/09/2006 Letter of approval: Start of operation: 05/2007 Project termination: 04/2014 Crediting period: from 05/2007 Date of issue: NA	84,965	16,993/ year 8 year total: 118,948	None	21/12/2006	16993	0602
14	Ketonis, Alexigros					PDD submitted: 28/09/2006 Letter of approval: Start of operation: 05/2008 Project termination: 04/2015 Crediting period: from 05/2008 Date of issue: NA	259,275	55,559/ year 8 year total: 388,910	None	28/12/2006	55559	0601
15	Afxentiou					PDD submitted: 28/09/2006 Letter of approval: Start of operation: 01/12/2007 Project termination: 1/12/2014 Crediting period: from 01/12/2007 Date of issue: NA	107,206	22,436/ year 7 year total: 157,050	None			

Table 38. Annual estimation of emission reductions (tCO₂ eq./year) according to the PDD submitted to the Cyprus DNA, to be hosted by Cyprus

Annual estimation of emission reductions (tCO ₂ eq./year) according to the PDD submitted to the Cyprus DNA																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
	Anaerobic digestion at Armenis Farm Ltd	Wind Park at Orites Archimandritas	Kambi Wind Farm Project	30 MW TSP Aeolian Dynamics Wind Power Project	Orounda Biogas plant in Cyprus	Animalia	Andreou & costi	Rokas Renewables	Rokas Renewables	A. Kailas& Sons Ltd, Cyprus	S. & P. Lagos Farm LTD	Christakis N. Neophytou Biogas Ltd., Cyprus	Mari Wind Farm Project	Alexigros Wind Farm Project	Afxentiou	
	Methane recovery in agricultural and agro industrial activities	Renewable electricity generation in grid connected applications (wind)	Grid connected renewable electricity generation (wind)	Renewable electricity generation in grid connected applications (wind)	Methane recovery in agricultural and agro industrial activities	Methane recovery in agricultural and agro industrial activities	Methane recovery in agricultural and agro industrial activities	Renewable electricity generation in grid connected applications (wind)	Renewable electricity generation in grid connected applications (wind)	Methane recovery in agricultural and agro industrial activities	Methane recovery in agricultural and agro industrial activities	Methane recovery in agricultural and agro industrial activities	Small scale, Grid connected renewable electricity generation (wind)	Large scale, Grid connected renewable electricity generation (wind)	Methane recovery in agricultural and agro industrial activities	
2007*															17,002	17,002
2008*	7,471														18,404	25,875
2009*	1,552					11,337	17,474								22,640	53,003
2010	16,280	234,148			34,366	12,342	17,474								23,840	338,450
2011	16,768	234,148	12,984	59,853	34,366	12,342	17,474	21,099	22,295	6,951	10,422	10,310			24,639	483,651
2012	17,095	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559	25,170	579,545
2013	17,315	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559	25,355	579,950
2014	17,462	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559		554,742
2015	17,560	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559		554,840
2016	17,626	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559		554,906
2017	17,670	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559		554,950
2018	11,277	234,148	12,984	59,853	34,366	12,342	17,474	50,007	24,364	6,951	10,422	10,310	8,500	55,559		548,557
2019		234,148	12,984	59,853	34,366			50,007	24,364	6,951	10,422	10,310	8,500	55,559		507,464
2020			12,984	59,853				50,007	24,364	6,951	10,422	10,310	8,500	55,559		238,950
2021								28,908	2,069				8,500	55,559		95,036
Total	158,076	2,341,480	129,840	598,530	343,660	122,415	174,740	500,070	243,640	69,510	104,220	103,100	85,000	555,590	157,050	5,686,921

* project postponed; not yet issued

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