**Department of Environment**
**Ministry of Agriculture,**
**Rural Development and Environment**

# Cyprus' update on the national system for policies and measures and projections, the low-carbon development strategy, climate policies and measures and greenhouse gas projections

in accordance to

Articles 13 and 14 on reporting by Member States of "Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC"

and

Articles 20, 21, 22 and 23 of "Commission Implementing Regulation (EU) No 749/2014 of 30 June 2014 on structure, format, submission processes and review of information reported by Member States pursuant to Regulation (EU) No 525/2013 of the European Parliament and of the Council"

**April 2016**

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| Title of report | **Cyprus' update on climate policies and measures and GHG projections, March 2016** |
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# 1. Background

Pursuant to Articles 13 and 14 in "Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC" (MMR)[1], EU Member States must report to the Commission updated information on the national system for policies and measures and projections, the low-carbon development strategy, climate policies and measures and greenhouse gas projections no later than 15 March 2015, and every second year thereafter. Moreover, Member States should communicate to the Commission any substantial changes to the information reported pursuant to this Article during the first year of the reporting period, by 15 March of the year following the previous report.

The previous ordinary update of policies and projections was submitted to the Commission in March 2015.

This update is submitted to the Commission based on the revisions made during the preparation of the Second Biennial Report under the UNFCCC.

The content of this update meets the requirements in Articles 13 and 14 of regulation no 525/2013, and the requirements in the implementing acts referred to in Article 12(3) of the regulation. This includes information in accordance with Articles 20 – 23 in "Commission Implementing Regulation (EU) No 749/2014 of 30 June 2014 on structure, format, submission processes and review of information reported by Member States pursuant to Regulation (EU) No 525/2013 of the European Parliament and of the Council"(MMR IR)[2].

**NOTES**

- This report is accompanied by the electronic submission of tables included in Annex XII and Annex XII of IR, through the EIONET CDR.
- This report contains slightly modified projections in comparison to the projections submitted under BR2 due to some mistakes that have been identified and corrected.
- This report uses the NIR2016 as the latest NIR.

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:165:0013:0040:EN:PDF
[2] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0749&from=EN

# 2. Reporting on policies and measures (MMR Art. 13)

## 2.1. Description of the national system for reporting on policies and measures and projections (MMR Art. 13(1)(a))

In accordance with Article 13(1)(a) of the MMR and Article 20 of the IR this chapter contains information on Cyprus' national system pursuant to Article 12(1) for reporting on policies and measures and projections of anthropogenic greenhouse gas emissions by sources and removals by sinks.

### 2.1.1. Information concerning the relevant institutional, legal and procedural arrangements, including the designation of the appropriate national entity or entities entrusted with overall responsibility for the policy evaluation of the Member State concerned and for the projections of anthropogenic greenhouse gas emissions

In Cyprus, the Department of Environment under the Ministry of Agriculture, Rural Development and Environment is the national entity entrusted with the overall responsibility for policy evaluation and for providing projections of anthropogenic greenhouse gas emissions.

The procedural arrangement for compiling information for policy evaluation and for making projections of anthropogenic greenhouse gas emissions in accordance with reporting requirements in EU legislation and under the UNFCCC and the Kyoto Protocol includes the involvement of and contributions from the following relevant ministries and institutions:

- Energy Service under the Ministry of the Energy, Commerce, Industry and Tourism
- Ministry of Transport, Communications and Works
- Department of Forests under the Ministry of Agriculture, Rural Development and Environment
- Department of Agriculture under the Ministry of Agriculture, Rural Development and Environment
- Ministry of Finance
- Directorate General for European Programmes, Coordination and Development
- Private companies for cement, ceramics and lime production

There are no legal arrangements for the collaboration that exists.

### 2.1.2. Description of relevant institutional, legal and procedural arrangements established within a Member State for evaluating policy and for making projections of anthropogenic greenhouse gas emissions by sources and removals by sinks

The institutional and legal arrangements for evaluating policy and for making projections of anthropogenic greenhouse gas emissions by sources and removals by sinks are described in Section 2.1.1.

There are no legal arrangements for the collaboration that exists for the preparation of the projections and the policies for GHG mitigation. When climate relevant policies are being evaluated and projections of anthropogenic greenhouse gas emissions by sources and removals by sinks are being elaborated, the procedural arrangement includes writing letters or emails to relevant ministries asking for their contributions to the evaluations and projections - either as information on the relevant policies and measures and their effects and, if available, specific projections, or as comments to draft text, draft findings and/or draft projections relevant to a particular policy or measure under the responsibility of the relevant ministry. The procedural arrangement usually also includes setting up the steering group with representatives from the relevant ministries and institutions.

### 2.1.3. Description of the relevant procedural arrangements and timescales to ensure the timeliness, transparency, accuracy, consistency, comparability and completeness of the information reported on policies and measures and the information reported on projections

A description of the relevant procedural arrangements is included in section 2.1.2.

The relevant timescales to ensure the timeliness, transparency, accuracy, consistency, comparability and completeness of the information reported on policies and measures and the information reported on projections are defined by the Department of Environment for the purpose of complying with reporting requirements in EU legislation, under the UNFCCC and under the Kyoto Protocol in a timely manner.

Therefore the timescales take into account: the due date for the reporting of the information and the time needed for making the information sufficiently transparent (e.g. descriptions of methods and assumptions in the context of projections), accurate (e.g. sensitivity analyses in the context of projections), consistent (in the context of projections e.g. that the results of the GHG projections are presented in such a way that they are consistent with the historic GHG inventories), comparable (in the context of projections e.g. that the results of the GHG projections are presented in such a way that they can be compared with the historic GHG inventories and with projections of other countries, if they present the results of their projections in a similar way) and complete (in the context of projections e.g. that all sources, sinks and greenhouse gases included in the historic GHG inventories are also included in the greenhouse gas projections).

These requirements are taken into account when information on policies and measures and projections are to be reported to the European Commission or the secretariat for the UNFCCC and the Kyoto Protocol.

Furthermore, when information on policies and measures and projections are to be reported to the European Commission or the secretariat for the UNFCCC and the Kyoto Protocol, the most updated information is reported – including information on the most recently published comprehensive and well-documented GHG projection.

### 2.1.4. Description of the overall process for the collection and use of data, together with an assessment of whether consistent processes for collection and use of data are underpinning the evaluation of policies and measures and the making of projections as well as the different projected sectors in the making of projections

The overall process for the collection and use of data is coordinated by the Department of Environment under the Ministry of Agriculture, Rural Development and Environment and involves collection and use of information and data from:

- Energy Service under the Ministry of the Energy, Commerce, Industry and Tourism
- Ministry of Transport, Communications and Works
- Department of Forests under the Ministry of Agriculture, Rural Development and Environment
- Department of Agriculture under the Ministry of Agriculture, Rural Development and Environment
- Ministry of Finance
- Directorate General for European Programmes, Coordination and Development
- Private companies for cement, ceramics and lime production

The processes for collection and use of information and data necessary for the evaluation of policies and measures and the making of projections are consistent as all relevant contributors are addressed in such a way that the information and data provided, e.g. activity data projections, are consistent with the statistical activity data used for the elaboration of historic greenhouse gas inventories.

To the extent that the projection methodologies across different projected sectors are based on the same parameters and assumptions, consistency across the sector projections is ensured. When the main drivers behind the projections of activity data differ across different projected sectors, consistency in the presentation of results is ensured. For all sectors it is ensured that the projection results in terms of greenhouse gas emissions are presented in a way that is consistent with the historic greenhouse gas inventories.

### 2.1.5. Description of the process for selecting assumptions, methodologies and models for policy evaluation, and for making projections of anthropogenic greenhouse gas emissions

Information on policy evaluation in relation to evaluation of effects and costs is included in Section 2.3.

Information on projections of anthropogenic greenhouse gas emissions, including information on assumptions, methodologies and models is included in Chapter 3.

### 2.1.6. Description of the quality assurance and quality control activities and of the sensitivity analysis for projections carried out

Information on projections of anthropogenic greenhouse gas emissions, including information on the quality assurance and quality control activities and of the sensitivity analysis for projections carried out is included in Chapter 3.

## 2.2. Update relevant to Cyprus' low-carbon development strategy (LCDS) and its implementation

Information on Cyprus' low-carbon development strategy and its implementation was submitted to the Commission on 16 March 2015. In accordance with Article 13(1)(a) of the MMR it should be noted that since then there have been no changes to the strategy, and no new information on its implementation. Information required under Article 21(a-e) of the IR can be obtained from the 16 March 2015 submission.

## 2.3. Information on applicable and relevant national policies and measures, or groups of measures, and on implementation of applicable and relevant Union policies and measures, or groups of measures, that limit or reduce greenhouse gas emissions by sources or enhance removals by sinks, presented on a sectoral basis and organised by gas or group of gases

The national policies are prepared, updated, and monitored by the Ministry of Agriculture, Rural Development and Environment (MARDE), in collaboration with the responsible Ministry for each measure or policy. Currently, the main focus of the policy related to reduction of greenhouse gas emissions is energy. Energy in 2013 accounted for 69% of the total GHG emissions (without LULUCF) and increased by 45% compared to 1990 levels. The sector of energy for which most measures are implemented is energy production.

The policies and measures currently in implementation are presented in Table 1.

**Table 1. List of Policies and measures**

| |
|---|
| **A. Energy** |
| A1. Natural Gas |
| A2. Renewable Energy Sources |
| A2.1. Renewable Energy Sources in Electricity Production |
| A2.2. Renewable Energy Sources for Heating and Cooling |
| A2.3. Renewable Energy Sources in Transport |
| A3. Energy efficiency and savings |
| A3.1. Savings from Energy Efficiency in Residential Buildings |
| A3.2. Savings from Energy Efficiency in Tertiary Buildings |
| A3.3. Savings from Efficient Bulbs |
| A3.4. Savings from Insulation in Residential Sector |
| A3.5. Savings in Existing Companies |
| A4. Energy savings from promotion of biomass and alternative fuels in industry |
| **B. Transport** |
| B1. Reduction in fuel consumption for transport from the promotion of public transport |
| B2. Reduction in $CO_2$ emissions from road transport from promotion of low CO2 vehicles |
| **C. Agriculture** |
| C1. Reduction of emissions from manure management from the promotion of AD for animal waste |

| |
|---|
| **D. Waste** |
| D1. Reduction of emissions from controlled waste management sites from biogas recovery |
| D2. Reduction of emissions from wastewater treatment from the promotion of AD |
| D3. Reduction of organics to landfill |
| D4. Separate organics collection |
| **E. F-gases** |
| E1. F-gases recovery |

Reduction of emissions from uncontrolled waste management sites from management of uncontrolled disposal sites was a measure included in the previous submissions, which is not included in this submission. This measure has been fully implemented by 2013.

The contents of the sections that follow (2.3.1 - 2.3.6) contain information regarding:

- The objective of the policy or measure and a short description of the policy or measure (MMR Art. 13(1)(c)(i))
- Type of policy instrument (MMR Art. 13(1)(c)(ii))
- Status of implementation of the policy or measure or group of measures (MMR Art. 13(1)(c)(iii))

Indicators to monitor and evaluate progress over time (MMR Art. 13(1)(c)(iv)) are not used and therefore not included in this report. Quantitative estimates of the effects on emissions by sources and removals by sinks of greenhouse gases (MMR Art. 13(1)(c)(v)) are presented in Chapter 3.

Where available, estimates of the projected costs and benefits of policies and measures, as well as estimates, as appropriate, of the realised costs and benefits of policies and measures (MMR Art. 13(1)(c)(vi)) are reported.

Where available, all references to the assessments and the underpinning technical reports (MMR Art. 13(1)(c)(vii)) are reported.

### 2.3.1. Sectoral policies and measures: Energy

The emissions of the energy sector except transport increased from 2735 Gg $CO_2$ eq. in 1990 to 3876 Gg $CO_2$ eq. in 2013, corresponding to 42% increase. In 2013, emissions decreased by 16% compared to 2012. 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.

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 cost of energy supply.
(c) High dependence on petroleum products - small supply security.
(d) Seasonal variations in energy demand.

(e) Maximum operation of the system of production and distribution of electricity in peak load demand.
(f) 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 Energy, Commerce, Industry and Tourism.

### *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 primarily for use in electricity generation. It is however expected that after its arrival, natural gas will also be used in other sectors of the economy (commercial, industrial and transport).

Currently, efforts are being made for the introduction of natural gas initially for power generation. Consequently, the Electricity Authority of Cyprus (single conventional fuel electricity producer) has included natural gas in its development strategies. By importing natural gas, apart from the reduction of emissions from the actual use of the natural gas, there would also be a positive contribution to emission reductions through the increased efficiency of the newer technologies used.

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, Commerce, Industry and Tourism |
| Other involved authorities | - Cyprus Energy Regulatory Authority<br>- Public Natural Gas Company (DEFA)<br>- Electricity Authority of Cyprus<br>- Department of Environment |
| Status of implementation | Adopted |
| Type | Political, Regulatory |
| National legislation | - Κ.Δ.Π. 115/2006<br>- N. 183(I)/2004 as amended |
| Relevant EU 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 | - Import and use of natural gas for electricity production<br>- Installation of combined cycle electricity production units using natural gas as fuel<br>- Decommissioning or conversion of existing electricity production units |
| Mitigation impact 2020 | 672 Gg $CO_2$ eq. |

### *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 5.9% in 2014 (Energy

Service, 2016). 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 in toe, 2014 (Energy Service, 2016)**

| | **Biofuels** | **Solar Thermal** | **Geothermal** | **Biomass** | **Electricity - Biomass** | **Electricity - Wind** | **Electricity - PV Systems** | **TOTAL** |
|---|---|---|---|---|---|---|---|---|
| Cement industry | | | | 6610 | | | | 6610 |
| Road transport | 10030 | | | | | | | 10030 |
| Households | | 66770 | 1551 | 6072 | | | 1484 | 75877 |
| Agriculture | | | | | 1125 | | | 1125 |
| Industry | | | | 2427 | | | | 2427 |
| Commerce, Hotels & Services | | 10018 | | 4546 | | 37 | 6 | 14607 |
| **TOTAL** | **10030** | **66788** | **1551** | **19655** | **4347** | **15725** | **7189** | **125285** |
| Electricity to Grid | | | | | 3222 | 15688 | 5699 | 24609 |

Renewable energy sources and energy efficiency is promoted to the public by provisions of financial support schemes. On-going schemes promoting small and disperse electricity production and prosumers through the installation of Photovoltaic Systems (net-metering and auto production) in households and businesses, taking full advantage of the favourable weather conditions.

The present status of RES (as of the end of 2015) in the electricity sector is encouraging since almost 80 MW of photovoltaic systems, 10.7MW of biomass units and 157.5MW of wind parks have already been installed. The energy production from RES systems in 2014 was equivalent to 129.730 toe, corresponding to a share of 8.06% in final Energy Consumption.

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 their 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.

**Table 3. Summary of the targets trajectory for Renewable energy sources in Cyprus (according to the National Renewable Energy Action Plan)**

| | 2010 | 2015 | 2020 |
|---|---|---|---|
| **Renewable energy sources to reach 13% in 2020 in the gross final energy consumption** | | | |
| Heating and cooling | 16.2% | 20% | 23.5% |
| Electricity production | 4.3% | 8.4% | 16% |
| Transport | 2.2% | 3.1% | 4.9% |
| Total share of RES | 6.5% | 9.0% | 13% |
| **Renewable energy sources to reach 10% of final energy consumption in transport in 2020** | | | |
| Transport | 2.2% | 3.3% | 10% |

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 submitted in July 2010.

The National Renewable Energy Action Plan is under revision due to the recent developments in the energy sector concerning primarily the potential use of imported or indigenous natural gas and electricity cost reduction by optimizing the penetration of renewables in the competitive environment of the internal market.

A2.1. Renewable energy sources in electricity production

Electricity production contributed 49% to the emissions of the energy sector in 2013, which corresponds to 34% to the total emissions of the country (excluding LULUCF). This corresponds to 2839 Gg CO2 eq., whereas the total emissions of the country without LULUCF were 8319 Gg CO2 eq. 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.

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, Commerce, Industry and Tourism |
| Other involved authorities | - Cyprus Energy Regulatory Authority<br>- Transmission System Operator<br>- Distribution System Operator<br>- Ministry of Finance<br>- Department of Town Planning and Housing, Ministry of Interior, Department of Environment,<br>- Ministry of Agriculture, Rural Development and Environment |
| Type | Regulatory, voluntary |
| National legislation | - Law No. 112(I)/2013 on the promotion and encouragement of the use of renewable energy sources which has repealed the old one (N.33(I)/2013)<br>- Law No. 110(I)/2011 establishing a European emissions trading system and other relevant issues<br>- Law No. 248(I)/2015 & 157(I)/2015 amending Law No. 112(I)/2013 |
| Relevant EU 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 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)<br>- 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<br>- 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<br>- 2010 4.3%<br>- 2015 8.4%<br>- 2020 16% |
| Measures towards attainment | - RES support schemes,<br>- Informational campaigns,<br>- Implementation of relevant legislation |
| Cost so far | €96,738,396 |

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 2013, and 6.1% to the total emissions of the country (excluding LULUCF). The RES technologies promoted through the scheme are solar thermal, biomass, and geothermal.

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, Commerce, Industry and Tourism |
| Other involved authorities | - Department of Town Planning and Housing, Ministry of Interior<br>- Department of Environment, Ministry of Agriculture, Natural Resources and Environment<br>- Department of Labour Inspection, Ministry of Labour and Social Insurance |
| Type | Regulatory, voluntary |
| National legislation | - Law No. 112(I)/2013 on the promotion and encouragement of the use of renewable energy sources, which has repealed the old one (N.33(I)/2013)<br>- Law No. 142(I)/2006 regulating energy efficiency in buildings<br>- Law No. 30(I)/2009 amending Law No. 142(I)/2006 regulating energy efficiency in buildings<br>- Law No. 56(I)/2003 on Integrated Pollution Prevention Control (with amending laws no. 15(I)/2006, 12(I)/2008)<br>- Law No. 248(I)/2015 & 157(I)/2015 amending Law No. 112(I)/2013 |
| Relevant EU 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 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)<br>- 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<br>- 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<br>- Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control and related amendments |
| Target[3] | RES share in energy consumption for heating and cooling<br>- 2010: 16.2%<br>- 2015: 20%<br>- 2020: 23.5% |
| Measures towards attainment | - RES support schemes<br>- Informational campaigns<br>- Implementation of relevant legislation |
| Cost so far | €47,527,618 |
| Comments | - 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<br>- EU on waste and IPPC are indirectly promoting anaerobic digestion to livestock breeding units. |

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, 2003/30/EC and 2009/30/EC and the action plan submitted by Cyprus for the achievement of the target set, RES for transport in gross final consumption should be 2.2% in 2010, 3.1% in 2015 and 4.9% in 2020. As of the end of 2014 the share of RES in transport was 2.62%. RES share in final consumption for transport calculated according to the methodology set by the directive 2009/28/EC.

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, Commerce, Industry and Tourism |
| Other involved authorities | - Department of Customs<br>- Department of Environment, Ministry of Agriculture, Rural Development and Environment;<br>- Department of Labour Inspection, Ministry of Labour and Social Insurance |
| Type | Regulatory, voluntary |
| National legislation | - Law No. 112(I)/2013 on the promotion and encouragement of the use of renewable energy sources, which has repealed the old one (N.33(I)/2013);<br>- Law No.148 (I)/2003 on the petroleum products and fuels specification; |

[3]% 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

| | |
|---|---|
| | - Decrees 63/2008 and 16/2009 on the content of biofuels in transport conventional fuels;<br>- Law No. 248(I)/2015 & 157(I)/2015 amending Law No. 112(I)/2013 |
| Relevant EU 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 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);<br>- 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;<br>- 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;<br>- 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 transport:<br>- 2010 2.2%<br>- 2015 3.3%<br>- 2020 10% |
| Measures towards attainment | - Implementation of grant scheme for installations producing biofuels;<br>- Implementation of relevant legislation |
| Cost so far | €3,976,108 |

### *A3. Energy efficiency and savings*

According to the Directives 2006/32/EC and 2012/27/EU, the member states have submitted to the European commission their National Energy Efficiency Action Plan (NEEAP) to achieve the targets for energy savings in final and primary consumption. Measure A3, presents some of the measures included in NEEAPs submitted in 2007, 2011 and 2014. These shall be revised during 2017 for the new national submission. Tables in the pages that follow describe some of the measures included in National Energy Efficiency Action Plan.

A3.1. Savings from energy efficiency in residential buildings

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, Commerce, Industry and Tourism |
| Other involved authorities | - Ministry of Interior;<br>- Municipalities |
| Type | Legislative, compulsory and incentives, voluntary |
| National legislation | - Laws that Regulate the Energy Performance of Buildings, Law No. 142(I)/2006, Law No. 30(I)/2009 and Law No. 210(I)/2012 |
| Relevant EU 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;<br>- Directive 2010/31/EU on the energy performance of buildings (recast); Directive 2012/27/EU on energy efficiency |
| Target[4] | Energy savings<br>- 2015 87.101 toe<br>- 2020 87.101 toe<br>- 2030 37.192 toe |
| Measures towards attainment | - Minimum energy performance requirements for new buildings, existing buildings that undergo major renovation and building elements that are substituted or retrofitted Energy Performance Certificates for new buildings and for buildings that are for sale or rent;<br>- Promotion of Nearly Zero Energy Buildings (NZEB);<br>- Incentives for renovating existing houses to save 40% energy or to reach energy class B or to reach NZEB levels;<br>- Regular inspection of heating systems with boiler and large air conditioning systems |
| 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

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, Commerce, Industry and Tourism |
| Other involved authorities | - Ministry of Interior;<br>- Municipalities |
| Type | Legislative, compulsory and incentives, voluntary |
| National legislation | - Laws that Regulate the Energy Performance of Buildings, Law No. 142(I)/2006, Law No. 30(I)/2009 and Law No. 210(I)/2012 |
| Relevant EU 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;<br>- Directive 2010/31/EU on the energy performance of buildings (recast); Directive 2012/27/EU on energy efficiency |

[4]% 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

| | |
|---|---|
| Target | Energy savings<br>- 2015 8891 toe<br>- 2020 8891 toe<br>- 2030 4850 toe |
| Measures towards attainment | - Minimum energy performance requirements for new buildings, existing buildings that undergo major renovation and building elements that are substituted or retrofitted Energy Performance Certificates for new buildings and for buildings that are for sale or rent;<br>- Promotion of Nearly Zero Energy Buildings (NZEB);<br>- Incentives for renovating existing houses to save 40% energy or to reach energy class B or to reach NZEB levels;<br>- Regular inspection of heating systems with boiler and large air conditioning systems |
| Comments | Decision 406/2009/EC is also requiring the sector of buildings to reduce its emissions. |

A3.3. Savings from efficient bulbs

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, 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;<br>- Law No. 56(I)/2014 amending Law No. 31(I)/2009; Law No 149(I)/2015 amending Law No. 31(I)/2009 |
| Relevant EU 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;<br>- Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC;<br>- 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<br>- 2015 15002 toe<br>- 2020 10491 toe<br>- 2030 0 toe |
| Measures towards attainment | - Information campaign and promotion of energy efficient lambs |
| Cost so far | €2,710,840 |

A3.4. Savings from insulation in residential sector

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, 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;<br>- Law No. 56(I)/2014 amending Law No. 31(I)/2009; Law No 149(I)/2015 amending Law No. 31(I)/2009 |
| Relevant EU 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;<br>- Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC;<br>- Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings<br>- 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<br>- 2015 11089 toe<br>- 2020 11089 toe<br>- 2030 10985 toe |
| Measures towards attainment | Grant scheme for energy conservation |
| Cost so far | €34,174,630 |

A3.5. Savings in existing companies

| | |
|---|---|
| Competent authority | Energy Service, Ministry of Energy, 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;<br>- Law No 56(I)/2014 amending Law No. 31(I)/2009; Law No 149(I)/2015 amending Law No. 31(I)/2009 |
| Relevant EU 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;<br>- Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC;<br>- 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<br>- 2015 13016 toe<br>- 2020 12424 toe<br>- 2030 3486 toe |
| Measures towards attainment | Grant scheme for energy conservation |
| Cost so far | €7,623,842 |

***A4. Improvement of electricity distribution system***

The electricity Distribution System is under the management of the Distribution System Operator of Cyprus. 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 National Transition System Operator of Cyprus, whereas other involved authorities are the Electricity Authority of Cyprus and the Department of Environment.

Some of the actions taken in order to improve the electricity distribution system include the following:

(a) In order to maintain voltage levels within permissible limits, the Electricity Authority of Cyprus installed 4 x 16MVAr (64 MVAr) inductor VAR Compensators at medium voltage (distribution system);
(b) Currently, Technical Assistance is on-going for assessing the current state of the transmission and distribution electricity systems and proposing optimum solutions for increasing the amount of Renewable Energy Sources (RES) generation that can be fed on the electricity system;
(c) Better grid and load management via smart meters/grids; the Electricity Authority of Cyprus is currently deploying a pilot system which will indicate best technical solutions as well as the costs and benefits of a potential full roll-out

### 2.3.2. Sectoral policies and measures: Transport

In 2013, road transport emissions contributed 22% of the total national emissions excluding LULUCF. The emissions of road transport increased by 53.5% 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 very low compared to other countries: 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.

The following two measures are currently under study. However, the preparation of the measures is not mature enough to estimate the reduction in GHG emissions or cost.

a. Deployment of electric vehicle infrastructure: The Department of Electrical and Mechanical Services and the Ministry of Energy, Commerce, Industry & Tourism are preparing a regulatory framework in order to promote the electric vehicle and also facilitate the deployment of the electric vehicle infrastructure. The regulatory framework will consist of direct financial incentives (through structural funds proposals) for the installation of charging stations, tax incentives and also public procurements for the deployment of infrastructure. Furthermore, it will consist of policy measures with non-financial incentives such as preferential access to parking areas, roadside parking, building and parking permits etc.

b. Permission of Liquid Petroleum Gas to be used as Transport Fuel: it is expected that the usage of liquid petroleum gas (LPG) as a transport fuel will be permitted in the following years. Depending on the usage of the LPG on private vehicles is expected to have an impact on the greenhouse gases emissions.

***B1. Promotion of public transport***

According to the plans of the Ministry of Transport, Communications and Works, the target is to increase the mode share of public transport from 2% in 2009 to 10% by 2020 (Department of Environment, 2010). Towards this end, at the end of 2009 the legal framework concerning public transport was revised, which allowed the introduction and development of new urban, suburban and intercity bus routes and schedules.

| | |
|---|---|
| Competent authority | Ministry of Communications and Public Works |
| Other involved authorities | Department of Environment |
| Type | Regulatory, Fiscal |
| National legislation | - Law No. 101(I)/2009 on the access to the profession of road transport (amending)<br>- Law No. 96(I)/2009 on the regulation of road transport (amending) |
| Relevant EU 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<br>- 2015: 1.9%<br>- 2020: 4.4%<br>- 2025: 4.4%<br>- 2030: 4.4% |
| Measures towards attainment | - Development and implementation of mobility master plans and land use transportation studies for the four large urban areas in |

| | |
|---|---|
| | the areas under the effective control of the Republic of Cyprus<br>- Development of infrastructure for public transport (bus lanes, bus priority lanes, new bus stops, new bus stations)<br>- Development and implementation of "park-and-ride" systems<br>- Study for the development of a tram system<br>- Feasibility Study for the development of a tram system in Nicosia |
| 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 |

***B2. Promotion of low CO2 vehicles***

The Motor Vehicle and Road Traffic Law of 2013 has brought changes to the registration and licence of a motor vehicle. The new road tax charge for vehicles registered from 1/1/2014 will depend on their $CO_2$ emissions. Vehicles registered by 31/12/2013 do not have to pay road tax based on their $CO_2$ emissions, but their owners will be charged an additional fee depending on engine size.

Electric cars and vehicles with $CO_2$ emissions of less than or equal to 120g/km (combined cycle) are exempted from the additional registration fee.

The registration fee for vehicles with $CO_2$ emissions over 120g/km and up to 150g/km will be €25 per gram over 120g. A €750 fee will be charged for vehicles emitting between 150g/km and 180g/km and a €2,250 fee for emissions above that, plus €400 for every gram over 180.

The new road tax will be charged as follows: vehicles emitting 120g/km, €0.5 per gram, 120g/km – 150g/km, €3, 150g/km – 180g/km, €3, and over 180g/km, €8.

For already registered vehicles (cars and motorcycles), the law provides for a special fee – above and beyond the current road tax – of €10 for low emissions, €20 for vehicles with engine displacements up to 2050 cc, and €30 for vehicles with engine displacements higher than 2050 cc.

| | |
|---|---|
| Competent authority | Ministry of Communications and Public Works |
| Other involved authorities | Department of Environment |
| Type | Regulatory, voluntary |
| National legislation | Motor Vehicle and Road Traffic Law of 2013 (no. 100(I)/2013) |
| Relevant EU 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 $CO_2$ emissions from road transport<br>- 2015: 2%<br>- 2020: 5%<br>- 2025: 5% |

| | |
|---|---|
| | - 2030: 5% |
| 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 |

### 2.3.3. Sectoral policies and measures: Industry

Under the provisions of Art. 9 of Regulation 517/2014/EC, on fluorinated greenhouse gases, without prejudice to existing Union legislation, Member States shall encourage the development of producer responsibility schemes for the recovery of fluorinated greenhouse gases and their recycling, reclamation or destruction.

Cyprus has recently adopted and harmonized the above Regulation. The next step is to forward a national Law regarding a producer's responsibility scheme. The main provision of this Law will follow the "polluter pays" principle and each producer will have to participate in an appropriate scheme for management of F-gases that have been recovered for any reason.

At the same time, under the provisions of the same scheme, certified technicians will be encouraged to return to the scheme any fluorinated gases that have been recovered, for a pre-decided profit.

So far, no details are available, but the main target is to annually increase recovery from 0% in 2020 to target 10% in 2030.

### 2.3.4. Sectoral policies and measures: Agriculture

***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.

***2014-2020 Rural Development Programme (RDP)***

The 2014-2020 RDP includes several actions aiming to reduce greenhouse gas emissions and also capture carbon in various ways. Specifically, these measures include:

M8 - Investments in forest area development and improvement of forest viability

Scheme 8.1: Afforestation and creation of woodland

Scheme 8.3: Prevention of damage to forests due to forest fires, natural disasters, and catastrophic events

Scheme 8.5: Investments that improve the resilience and environmental value of forest ecosystems

Additionally, by using appropriate plant species, the scheme will aid in the adaptation to climate change, as well as carbon capture in newly established forest stands.

M10 - Agro-environment and climate action

Scheme 10.1.1 Exclusion of chemical herbicide use on specific crops

The complete exclusion of chemical herbicide use and fertilizer application is required, according to the table prepared by the Department of Agriculture of key nutritional needs.

Limiting the application of plant protection products and implementing targeted fertilization according to crop needs is expected to have a positive contribution to the reduction of greenhouse gas emissions from agricultural activities.

Scheme 10.1.2 Application of crop rotation in the cultivation of potatoes and cereals

The application of the three-year system of legume crop incorporation in the ground can consequently capture carbon, and also reduce nitrogen emissions and demands in the application of nitrogen fertilization during the next growing season.

The measures included in the RDP have not been taken into account in the projections.

### 2.3.5. Sectoral policies and measures: Forestry

One of the goals set out in the Policy Statement of the Department of Forests is the Adaptation in climate change and enhancing the contribution of forests to combat climate change. This goal aims to the qualitative improvement of the structure and resilience of forest stands to biotic and abiotic factors due to climate change. Even though the measures taken by the Department of Forests are expected to contribute to the increase of CO2 absorbance, sufficient information is not available to estimate this contribution.

### 2.3.6. Sectoral policies and measures: Waste

***Reduction of emissions from municipal solid 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 Department of Environment.

The adopted policies and measures are guided by EU Directives into national legislation and set future targets with a goal in reducing emissions. The Waste Framework Directive 2008/98/EC introduces recycling and recovery targets to be achieved by 2020 for 50% of the household waste, and national Law on Waste No. 185(I)/2011 harmonizes the targets.

Biodegradable municipal waste to landfills is also targeted for reduction to 35% by weight of the total municipal waste produced in 1995, following the Landfill Directive 1999/31/EC, and is adopted by the national Regulatory Administrative Act (Κ.Δ.Π.) 562/2003 on Solid and Hazardous Waste for the year 2020.

Additionally, Article 1 of the Landfill Directive encourages the separate collection of biodegradable waste, which is ratified in Κ.Δ.Π.562/2003.

| | |
|---|---|
| Competent authority | Department of Environment |
| Other involved authorities | Ministry of Interior |
| Type | Legislative, compulsory |
| National legislation | - Solid and Hazardous Waste Law of 2002 (Κ.Δ.Π.562/2003)<br>- Waste Law of 2011 (No. 185(I)/2011) |
| Relevant EU legislation | - Landfill Directive 1999/31/EC<br>- Waste Framework Directive 2008/98/EC |
| Target | Recycling and recovery of household waste<br>- 2020: 50%<br>Reduction of biodegradable municipal waste to landfills<br>- 2020: 35%<br>Separate collection of biodegradable waste |

***Reduction of emissions from the promotion of anaerobic digestion for urban wastewater treatment***

Even though anaerobic digestion is not clearly stated in the European or national legislation, the technology is preferred by large 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. 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.

## 2.4. Information on planned additional national policies and measures envisaged with a view to limiting greenhouse gas emissions beyond Cyprus' commitments under Decision 406/2009/EC and in view of the implementation of an international agreement on climate change (MMR Art. 13(1)(d))

There are no planned additional national policies and measures envisaged with a view to limiting greenhouse gas emissions beyond Cyprus' commitments under Decision 406/2009/EC.

## 2.5. Information on the extent to which the Cyprus' action constitutes a significant element of the efforts undertaken at national level as well as the extent to which the projected use of joint implementation, of the CDM and of international emissions trading is supplemental to domestic action in accordance with the relevant provisions of the Kyoto Protocol and the decisions adopted thereunder (MMR Art. 13(1)(e))

Cyprus does not 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 limitation or reduction commitment pursuant to the Kyoto Protocol - in meeting the 2013-2020 targets.

# 3. Projections (MMR Art. 14)

## 3.1. Introduction

This chapter includes the requirements of MMR Art. 14(1). Namely:

- projections without measures where available, projections with measures, and, where available, projections with additional measures (Art. 14(1)(a))
- total greenhouse gas projections and separate estimates for the projected greenhouse gas emissions for the emission sources covered by Directive 2003/87/EC and by Decision No 406/2009/EC (Art. 14(1)(b))
- the impact of policies and measures identified pursuant to Article 13. Where such policies and measures are not included, this shall be clearly stated and explained (Art. 14(1)(c))
- results of the sensitivity analysis performed for the projections (Art. 14(1)(d))
- all relevant references to the assessment and the technical reports that underpin the projections (Art. 14(1)(e))

The following sections describe a "without measures" or "business as usual" (BaU) scenario, a "with measures" (WM) scenario, and a "with additional measures" (WAM) scenario concerning the national projections of greenhouse gas emissions by sources and their removals by sinks for the years 2015, 2020, 2025, and 2030.

The "without measures" scenario assumes that no additional emission reduction policies and measures are implemented than the existing ones. The "with measures" scenario assumes that no additional emission reduction policies and measures are adopted than the existing ones. The "with additional measures" scenario assumes the implementation of additional policies (planned). The three scenarios are presented in the following sections.

The policies and measures included in each scenario are presented in Table 4 and the resulting impact is presented in Figure 1.

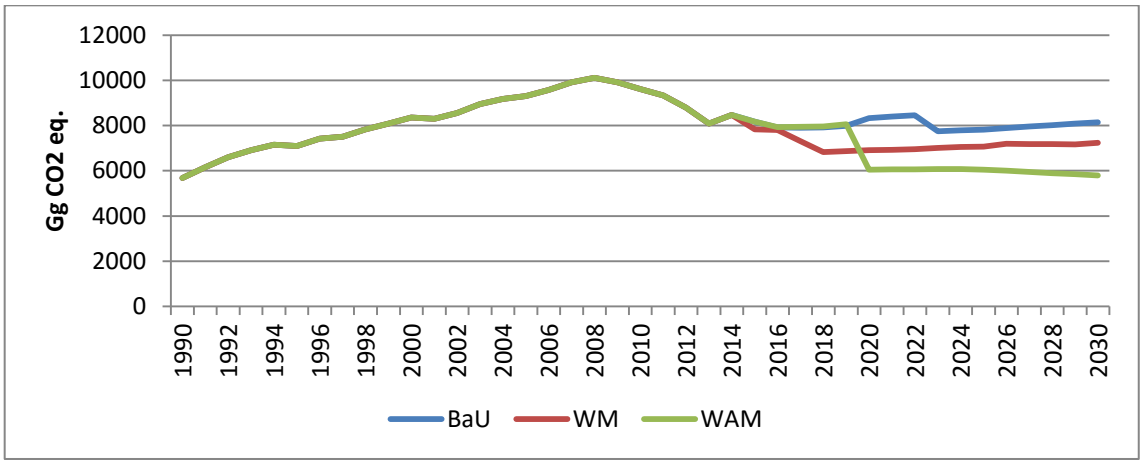


**Figure 1. Total GHG emissions by scenario (Gg CO2 eq.) 1990-2030**

**Table 4. Summary of policies and measures included in each scenario**

| | With measures | | | | With Additional Measures | | | |
|---|---|---|---|---|---|---|---|---|
| | Target | | | | Target | | | |
| | 2015 | 2020 | 2025 | 2030 | 2015 | 2020 | 2025 | 2030 |
| **A. Energy** | | | | | | | | |
| A1. Natural Gas | | | | | | | | |
| A2. Renewable Energy Sources | | | | | | | | |
| A2.1. Renewable Energy Sources in Electricity Production | 8.40% | 16% | | | 8.40% | 16% | | |
| A2.2. Renewable Energy Sources for Heating and Cooling | 20% | 23.50% | | | 20% | 23.50% | | |
| A2.3. Renewable Energy Sources in Transport | 3.30% | 10% | | | 3.30% | 10% | | |
| A3. Energy efficiency and savings | | | | | | | | |
| A3.1. Savings from Energy Efficiency in Residential Buildings (toe) | 87101 | 87101 | | 37192 | 87101 | 87101 | | 37192 |
| A3.2. Savings from Energy Efficiency in Tertiary Buildings (toe) | 8891 | 8891 | | 4850 | 8891 | 8891 | | 4850 |
| A3.3. Savings from Efficient Bulbs (toe) | 15002 | 10491 | | 0 | 15002 | 10491 | | 0 |
| A3.4. Savings from Insulation in Residential Sector (toe) | 11089 | 11089 | | 10985 | 11089 | 11089 | | 10985 |
| A3.5. Savings in Existing Companies (toe) | 13016 | 12424 | | 3486 | 13016 | 12424 | | 3486 |
| A4. Energy savings from promotion of biomass and alternative fuels in industry | 3.60% | 3.80% | 4% | 4% | 3.60% | 3.80% | 5.00% | 10% |
| **B. Transport** | | | | | | | | |
| B1. Reduction in fuel consumption for transport from the promotion of public transport | 1.90% | 4.40% | 4.40% | 4.40% | 1.90% | 4.40% | 5.00% | 10% |
| B2. Reduction in CO2 emissions from road transport from promotion of low CO2 vehicles | 2% | 5% | 5% | 5% | 2% | 5% | 10% | 10% |
| **C. Agriculture** | | | | | | | | |
| C1. Reduction of emissions from manure management from the promotion of AD for animal waste | 6% | 8.50% | 8.50% | 8.50% | 6% | 8.50% | 11% | 13.50% |
| **D. Waste** | | | | | | | | |
| D1. Reduction of emissions from controlled waste management sites from biogas recovery | 10% | 70% | 70% | 70% | 10% | 70% | 80% | 80% |
| D3. Reduction of emissions from wastewater treatment from the promotion of AD | 6% | 8.50% | 8.50% | 8.50% | 6% | 8.50% | 11% | 13.50% |
| D4. Reduction of organics to landfill | | ≤95 kt* | ≤95 kt | ≤95 kt | | ≤95 kt* | ≤95 kt | ≤95 kt |
| D5. Separate organics collection | | 12% | | 15% | | 12% | | 15% |
| **E. F-gases** | | | | | | | | |
| E1. F-gases recovery | | 0% | 5% | 10% | | 0% | 5% | 10% |

* from 2016

Three important things that should be noted for these projections are the following:

(a) The change noticed during the recent years in the types of HFCs used is not taken into consideration due to the high uncertainty associated to any prediction of such changes.
(b) The emissions from the possible exploitation of natural gas in the Exclusive Economic Zone are not taken into account due to the high uncertainty associated to any prediction of such changes.
(c) All the projections for the sector of energy take into consideration the same targets for energy efficiency and renewable energy sources. The main differences between the three scenarios are energy demand, price of fuel and time at which natural gas will be available for use. These factors have an impact in the investments in renewable energy sources technologies and as a consequence the amount of energy produced by fossil fuels.

## 3.2. Without measures

The emissions for the without measures scenario have been estimated using the IPCC 2006 guidelines and projected activity data (Annex I). The resulting emissions by sector are presented in Table 5 and Figure 2. Emissions for LULUCF have not been estimated. The latest inventory year used as reference is 2013[5]. The emissions by gas are presented in Table 6. Energy projections are based on the assumptions and scenarios described in the report "Renewable Energy Roadmap for the Republic of Cyprus" prepared by IRENA (2015)[6].

Emissions based on the "with measures" scenario are projected to increase by 39% in 2030 compared to 1990 and decrease by 15% compared to 2005.

**Table 5. Total GHG emissions by sector (Gg CO2 eq.) 2013-2030**

| | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| **1. Energy** | 5744 | 5590 | 5626 | 5003 | 5233 |
| 1.A.1.a. Public electricity and heat production | 2839 | 2658 | 2758 | 2183 | 2456 |
| 1.A.2. Manufacturing industries and construction | 470 | 612 | 564 | 554 | 545 |
| 1.A.3. Transport | 1936 | 1875 | 1861 | 1824 | 1790 |
| 1.A.3.a. Domestic aviation | 36 | 39 | 67 | 53 | 56 |
| 1.A.3.b. Road transportation | 1898 | 1834 | 1793 | 1770 | 1733 |
| 1.A.3.d. Domestic navigation | 2 | 1 | 2 | 2 | 1 |
| 1.A.4. Other sectors | 499 | 445 | 442 | 441 | 441 |
| 1.A.4.a. Commercial/Institutional | 90 | 78 | 77 | 77 | 76 |
| 1.A.4.b. Residential | 339 | 305 | 303 | 301 | 301 |
| 1.A.4.c. Agriculture/Forestry/Fishing | 70 | 63 | 62 | 63 | 63 |
| **2. Industrial processes** | 1157 | 1457 | 1466 | 1473 | 1481 |
| 2.A. Mineral Industry | 765 | 1080 | 1081 | 1083 | 1084 |
| 2.A. of which cement production | 752 | 1068 | 1068 | 1068 | 1068 |
| 2.A. of which other non cement production | 13 | 12 | 13 | 14 | 15 |
| 2.D. Non-energy products from fuels and solvent use | 4 | 4 | 4 | 4 | 4 |

[5]Data was available for 2014 since during the preparation of the report NIR2016 was available internally.
[6] Taibi E., P. Journeay-Kaler, C. Taliotis, M. Howells, M. Welsch, T. Zachariadis, G. Partasides, I. Spyrides, C. Varnava, I. Zavrou, S. Papadouris and C. Rouvas. 2015. Renewable Energy Roadmap for the Republic of Cyprus. international Renewable Energy Agency

| | | | | | |
|---|---|---|---|---|---|
| 2.F. Product uses as substitutes for ODS(2) | 327 | 313 | 319 | 325 | 330 |
| 2.G. Other product manufacture and use | 61 | 60 | 61 | 62 | 63 |
| **3. Agriculture** | 579 | 593 | 596 | 596 | 596 |
| 3.A. Enteric fermentation | 229 | 233 | 247 | 247 | 247 |
| 3.B. Manure management | 198 | 194 | 180 | 180 | 181 |
| 3.D. Agricultural soils | 152 | 166 | 168 | 168 | 168 |
| 3.H. Urea application | 0.8 | 0.4 | 0.4 | 0.4 | 0.4 |
| **5. Waste** | 494 | 521 | 520 | 543 | 585 |
| 5.A. Solid Waste Disposal | 445 | 465 | 369 | 294 | 234 |
| 5.B. Biological treatment of solid waste | 0.01 | 0.01 | 0.02 | 0.03 | 0.04 |
| 5.D. Wastewater treatment and discharge | 49 | 56 | 151 | 249 | 350 |
| **TOTAL (excl. LULUCF)** | **7974** | **8161** | **8208** | **7615** | **7894** |
| **Change compared to 1990** | **40%** | **44%** | **44%** | **34%** | **39%** |
| **Change compared to 2005** | **-14%** | **-12%** | **-12%** | **-18%** | **-15%** |
| **Change compared to 2013** | | **2%** | **3%** | **-5%** | **-1%** |

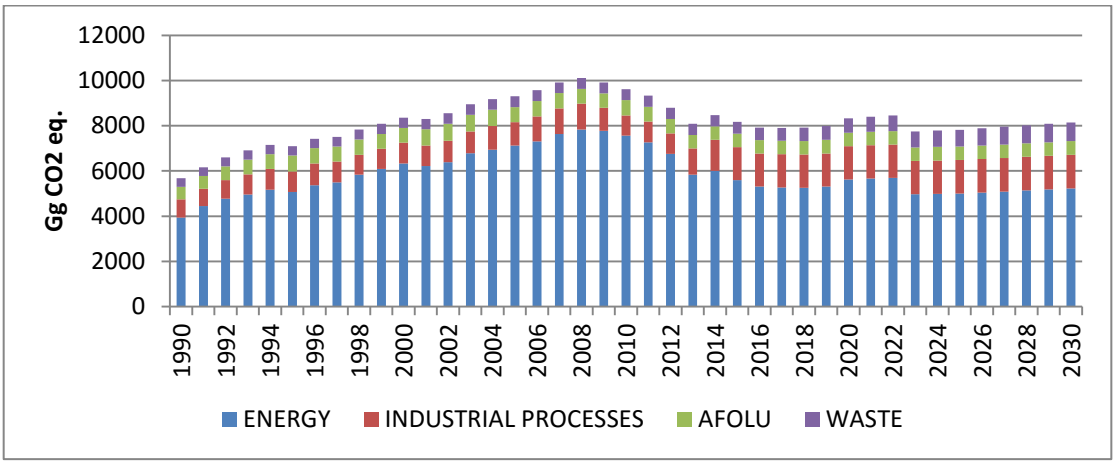


**Figure 2. Without measures: Total GHG emissions by sector (Gg CO2 eq.) 1990-2030**

**Table 6. Without measures: Total GHG emissions by gas 2013-2020**

| Gg CO2 eq. | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| CO2 | 6440 | 6600 | 6639 | 6026 | 6257 |
| CH4 | 843 | 870 | 873 | 892 | 932 |
| N2O | 326 | 338 | 337 | 333 | 333 |
| HFCs & SF6 | 327 | 313 | 319 | 325 | 330 |
| **TOTAL** | **7974** | **8161** | **8208** | **7615** | **7894** |

### 3.2.1. Directive 2003/87/EC and Decision No 406/2009/EC

The total ETS / ESD emissions for the "Without measures" projections are presented in Table 7 and Figure 3.

**Table 7. ETS and ESD emissions according to the "Without measures" scenario**

| Gg CO2 eq. | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| Total ETS GHGs | 4071 | 4348 | 4401 | 3816 | 4079 |
| Total ESD GHGs | 3903 | 3813 | 3807 | 3799 | 3815 |
| Total GHGs | 7974 | 8161 | 8208 | 7615 | 7894 |

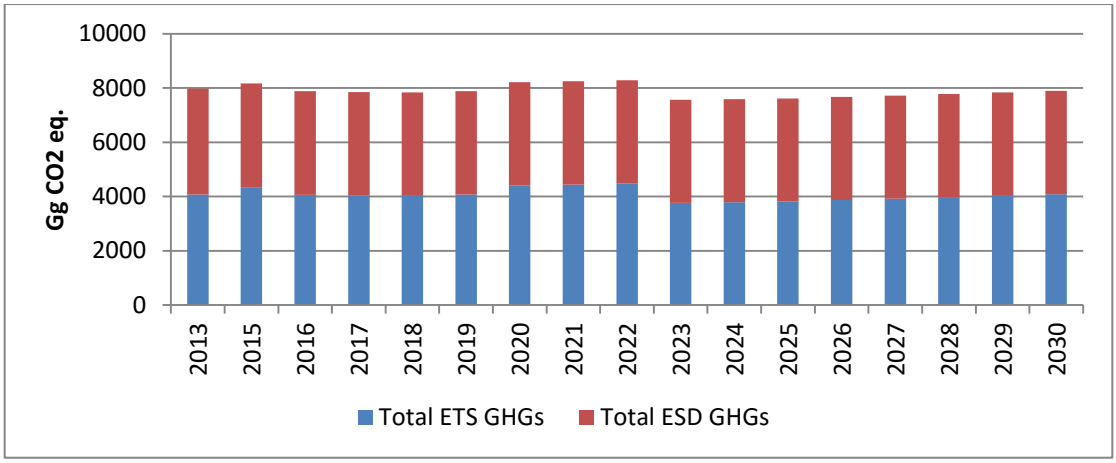


**Figure 3. ETS and ESD emissions according to the "Without measures" scenario**

## 3.3. With measures

The measures included in the "With measures" scenario are listed in Table 8, along with the resulting activity data used for the calculations. Reduction in the emissions is also presented in the table.

All the emission factors and methodologies used are according to the NIR2015. The change in the emissions is presented in Table 9 and Figure 4. The difference in the total emissions between the "Without measures" and the "With measures" scenario are presented in Figure 5.

Emissions based on the "with measures" scenario are projected to increase by 27% in 2030 compared to 1990 and decrease by 22% compared to 2005. In 2030 the difference between the "with measures" scenario and the "without measures" scenario (BaU) is -8%.

**Table 8. Measures included in the "With measures" scenario and impact on activity data and emissions**

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ENERGY** | | | | | | | | | | | | | | | | |
| Total electricity production (GWh) | 4505 | 4155 | 4255 | 4365 | 4580 | 4750 | 4980 | 5105 | 5275 | 5445 | 5880 | 5927 | 5974 | 6022 | 6069 | 6116 |
| Electricity production from RES (GWh) | 389 | 699 | 719 | 735 | 755 | 828 | 922 | 983 | 1043 | 1104 | 1165 | 1246 | 1327 | 1407 | 1488 | 1569 |
| Electricity production from conventional fuels (GWh) | 4116 | 3456 | 3536 | 3630 | 3825 | 3922 | 4058 | 4122 | 4232 | 4341 | 4715 | 4681 | 4648 | 4614 | 4581 | 4547 |
| Electricity production from conventional fuels (TJ) | 30490 | 25601 | 26193 | 26890 | 28334 | 29919 | 30060 | 30534 | 31349 | 32156 | 32572 | 34678 | 34429 | 34180 | 33931 | 35209 |
| Gas | 0 | 0 | 13097 | 26890 | 28334 | 29919 | 30060 | 30534 | 31349 | 32156 | 32482 | 34678 | 34429 | 34180 | 33931 | 35199 |
| HFO | 26236 | 26352 | 13232 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diesel | 4254 | 4273 | 2146 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduction in emissions (Gg CO2 eq.) | 260 | -26 | 422 | 851 | 831 | 1071 | 1105 | 1119 | 361 | 343 | 351 | 282 | 350 | 419 | 487 | 470 |
| **TRANSPORT** | | | | | | | | | | | | | | | | |
| **B1. Reduction in fuel consumption for transport from the promotion of public transport** | **1.9%** | **2.4%** | **2.9%** | **3.4%** | **3.9%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** | **4.4%** |
| Reduction in consumption from B1 (TJ) | 474 | 598 | 719 | 837 | 955 | 1072 | 1070 | 1070 | 1068 | 1063 | 1058 | 1054 | 1049 | 1045 | 1041 | 1036 |
| Fuel consumption (TJ) | 24482 | 24301 | 24060 | 23779 | 23532 | 23301 | 23251 | 23243 | 23198 | 23101 | 22998 | 22893 | 22789 | 22696 | 22607 | 22518 |
| Gasoline | 14717 | 14550 | 14305 | 14022 | 13800 | 13606 | 13544 | 13531 | 13478 | 13386 | 13294 | 13205 | 13123 | 13052 | 12988 | 12928 |
| Diesel | 9473 | 9461 | 9465 | 9465 | 9439 | 9402 | 9413 | 9418 | 9426 | 9418 | 9405 | 9387 | 9364 | 9341 | 9315 | 9284 |
| Biofuels | 292 | 291 | 291 | 292 | 293 | 293 | 294 | 294 | 295 | 297 | 298 | 300 | 302 | 304 | 305 | 306 |
| Reduction in CO2 emissions from B1 (Gg) | 0.0 | 0.0 | 8.4 | 17.4 | 26.4 | 35.4 | 35.3 | 35.2 | 35.1 | 34.9 | 34.7 | 34.5 | 34.4 | 34.2 | 34.0 | 33.9 |
| **B2. Reduction in CO2 emissions from road transport from promotion of low CO2 vehicles** | **2%** | **2.6%** | **3.2%** | **3.8%** | **4.4%** | **5%** | **5%** | **5%** | **5%** | **5%** | **5%** | **5%** | **5%** | **5%** | **5%** | **5%** |
| Reduction in CO2 emissions from B2 (Gg) | 35.5 | 46.1 | 56.5 | 66.6 | 76.8 | 86.8 | 86.7 | 86.6 | 86.5 | 86.1 | 85.7 | 85.4 | 85.0 | 84.6 | 84.3 | 84.0 |
| **AGRICULTURE** | | | | | | | | | | | | | | | | |
| **C1. Reduction of emissions from manure management from the promotion of AD for animal waste** | **6.0%** | **6.5%** | **7.0%** | **7.5%** | **8.0%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** |
| Reduction in emissions from C1 (Gg CO2 eq.) | 11.6 | 12.4 | 13.2 | 13.9 | 14.7 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 |
| **WASTE** | | | | | | | | | | | | | | | | |
| **D1. Reduction of emissions from** | **10%** | **22%** | **34%** | **46%** | **58%** | **70%** | **70%** | **70%** | **70%** | **70%** | **70%** | **70%** | **70%** | **70%** | **70%** | **70%** |

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **controlled waste management sites from biogas recovery** | | | | | | | | | | | | | | | | |
| Reduction in emissions from D1 (Gg CO2 eq.) | 26 | 59 | 93 | 128 | 166 | 205 | 210 | 215 | 220 | 226 | 231 | 237 | 243 | 249 | 255 | 262 |
| **D2. Reduction of emissions from wastewater treatment from the promotion of AD for sewage sludge** | **6.0%** | **6.5%** | **7.0%** | **7.5%** | **8.0%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** | **8.5%** |
| Reduction in emissions from D2 (Gg CO2 eq.) | 8.00 | 8.80 | 9.67 | 10.43 | 10.90 | 11.63 | 11.70 | 11.78 | 11.74 | 11.68 | 11.52 | 10.99 | 10.56 | 10.51 | 9.12 | 8.36 |
| Domestic (Gg CO2 eq.) | 7.93 | 8.72 | 9.58 | 10.34 | 10.80 | 11.53 | 11.59 | 11.67 | 11.64 | 11.58 | 11.41 | 10.89 | 10.35 | 10.30 | 8.88 | 8.11 |
| Industrial (Gg CO2 eq.) | 0.07 | 0.08 | 0.09 | 0.09 | 0.10 | 0.11 | 0.10 | 0.10 | 0.10 | 0.11 | 0.11 | 0.10 | 0.21 | 0.20 | 0.24 | 0.24 |
| **D3. Reduction of organics to landfill to ≤95 kt by 2020** | | | | | | | | | | | | | | | | |
| BAA kt | 293 | 243 | 194 | 144 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Gg waste to disposal sites | | | | | | | | | | | | | | | | |
| paper, paper pulp and products | 94.4 | 78.5 | 62.5 | 46.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 |
| food waste | 170.6 | 141.8 | 113.0 | 84.2 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 | 55.4 |
| non-food /garden | 27.6 | 23.0 | 18.3 | 13.6 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| Reduction in emissions from D3 (Gg CO2 eq.) | 0.0 | 0.0 | 1.2 | 6.0 | 13.8 | 24.1 | 36.8 | 48.1 | 58.0 | 66.6 | 73.9 | 79.9 | 84.8 | 88.4 | 90.9 | 92.3 |
| **D4. Separate organics collection** | **0%** | **3%** | **5%** | **8%** | **10%** | **12%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** |
| BAA separately collected (Gg) | 0 | 9 | 14 | 22 | 26 | 30 | 37 | 35 | 34 | 32 | 31 | 29 | 28 | 26 | 24 | 23 |
| remaining BAA (Gg) | 293 | 276 | 264 | 249 | 236 | 223 | 208 | 200 | 192 | 184 | 175 | 166 | 157 | 148 | 138 | 128 |
| Gg waste to disposal sites | | | | | | | | | | | | | | | | |
| paper, paper pulp and products | 94.4 | 89.1 | 85.3 | 80.3 | 76.2 | 72.0 | 67.1 | 64.6 | 62.0 | 59.3 | 56.5 | 53.7 | 50.7 | 47.7 | 44.6 | 41.4 |
| food waste | 170.6 | 161.0 | 154.1 | 145.2 | 137.7 | 130.1 | 121.3 | 116.8 | 112.1 | 107.2 | 102.2 | 97.0 | 91.7 | 86.2 | 80.6 | 74.8 |
| non-food /garden | 27.6 | 26.1 | 24.9 | 23.5 | 22.3 | 21.1 | 19.6 | 18.9 | 18.1 | 17.4 | 16.5 | 15.7 | 14.8 | 14.0 | 13.1 | 12.1 |
| Reduction in emissions from D4 (Gg CO2 eq.) | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 2.8 | 4.7 | 7.2 | 9.5 | 11.5 | 13.3 | 14.9 | 16.3 | 17.6 | 18.7 | 19.5 |
| **2F Product Uses as Substitutes for Ozone Depleting Substances** | | | | | | | | | | | | | | | | |
| **E1. F-gases recovery** | **0%** | **0%** | **0%** | **0%** | **0%** | **0%** | **1%** | **2%** | **3%** | **4%** | **5%** | **6%** | **7%** | **8%** | **9%** | **10%** |
| Reduction in emissions from E1 (Gg CO2 eq.) | 0 | 0 | 0 | 0 | 0 | 0 | 3.3 | 6.6 | 9.9 | 13.2 | 16.6 | 20.0 | 23.4 | 26.8 | 30.2 | 33.7 |

**Table 9. Changes in the projected emissions from the implementation of the "With measures" scenario**

| | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| **1. Energy** | **5744** | **5304** | **4433** | **4531** | **4644** |
| 1.A.1.a. Public electricity and heat production | 2839 | 2398 | 1688 | 1832 | 1986 |
| 1.A.2. Manufacturing industries and construction | 470 | 612 | 564 | 554 | 545 |
| 1.A.3. Transport | 1936 | 1849 | 1739 | 1704 | 1672 |
| 1.A.3.a. Domestic aviation | 36 | 39 | 67 | 53 | 56 |
| 1.A.3.b. Road transportation | 1898 | 1809 | 1670 | 1649 | 1615 |
| 1.A.3.d. Domestic navigation | 2 | 1 | 2 | 2 | 1 |
| 1.A.4. Other sectors | 499 | 445 | 442 | 441 | 441 |
| 1.A.4.a. Commercial/Institutional | 90 | 78 | 77 | 77 | 76 |
| 1.A.4.b. Residential | 339 | 305 | 303 | 301 | 301 |
| 1.A.4.c. Agriculture/Forestry/Fishing | 70 | 63 | 62 | 63 | 63 |
| **2. Industrial processes** | **1157** | **1464** | **1473** | **1464** | **1454** |
| 2.A. Mineral Industry | 765 | 1080 | 1081 | 1083 | 1084 |
| 2.A. of which cement production | 752 | 1068 | 1068 | 1068 | 1068 |
| 2.A. of which other non-cement production | 13 | 12 | 13 | 14 | 15 |
| 2.D. Non-energy products from fuels and solvent use | 4 | 4 | 4 | 4 | 4 |
| 2.F. Product uses as substitutes for ODS(2) | 327 | 320 | 326 | 315 | 304 |
| 2.G. Other product manufacture and use | 61 | 60 | 61 | 62 | 63 |
| **3. Agriculture** | **579** | **581** | **580** | **580** | **581** |
| 3.A. Enteric fermentation | 229 | 233 | 247 | 247 | 247 |
| 3.B. Manure management | 198 | 182 | 165 | 165 | 165 |
| 3.D. Agricultural soils | 152 | 166 | 168 | 168 | 168 |
| 3.H. Urea application | 0.8 | 0.4 | 0.4 | 0.4 | 0.4 |
| **5. Waste** | **494** | **487** | **422** | **499** | **554** |
| 5.A. Solid Waste Disposal | 445 | 439 | 283 | 261 | 212 |
| 5.B. Biological treatment of solid waste | 0.01 | 0.01 | 0.02 | 0.03 | 0.04 |
| 5.D. Wastewater treatment and discharge | 49 | 48 | 139 | 237 | 342 |
| **TOTAL (excl. LULUCF)** | **7974** | **7836** | **6908** | **7074** | **7233** |
| **Change compared to 1990** | **40%** | **38%** | **22%** | **24%** | **27%** |
| **Change compared to 2005** | **-14%** | **-16%** | **-26%** | **-24%** | **-22%** |
| **Change compared to 2013** | | **-2%** | **-13%** | **-11%** | **-9%** |
| **Change compared to BaU projections** | | **-4%** | **-16%** | **-7%** | **-8%** |

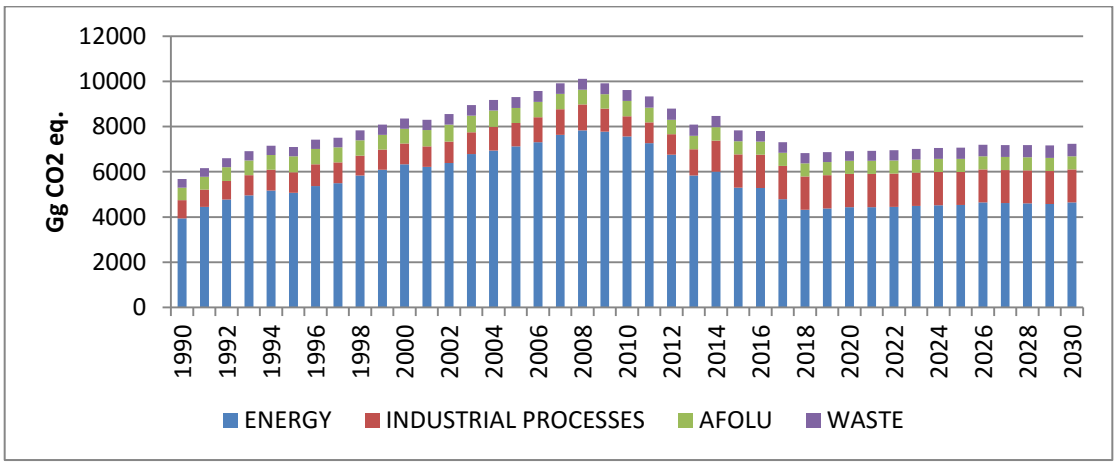


**Figure 4. With measures: Total GHG emissions by sector (Gg CO2 eq.) 1990-2030**

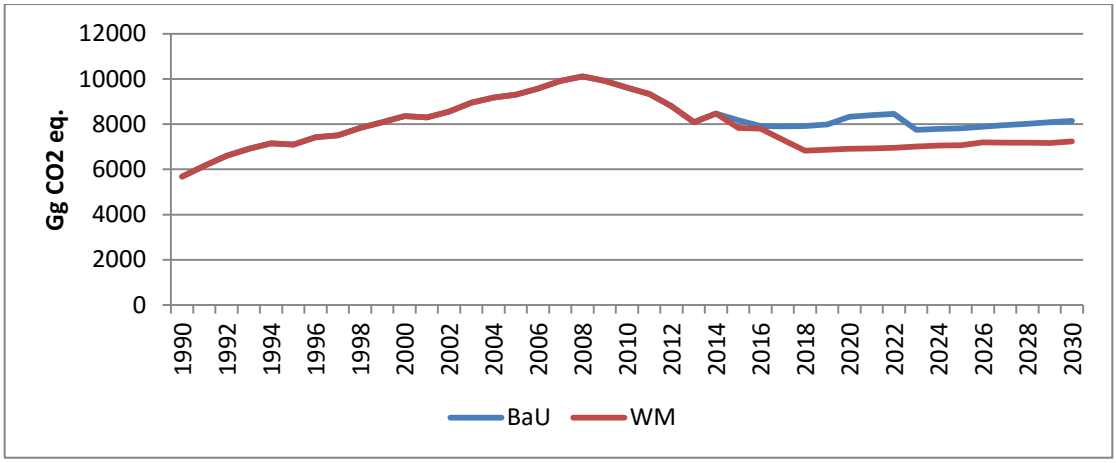


**Figure 5. With measures: Total GHG emissions compared to BaU (Gg CO2 eq.) 1990-2030**

**Table 10. With measures: Total GHG emissions by gas 2013-2020**

| Gg CO2 eq. | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| CO2 | 6440 | 6271 | 5405 | 5505 | 5620 |
| CH4 | 843 | 831 | 768 | 841 | 894 |
| N2O | 326 | 377 | 374 | 375 | 376 |
| HFCs & SF6 | 327 | 320 | 326 | 315 | 304 |
| **TOTAL** | 7974 | **7836** | **6908** | **7074** | **7233** |

### 3.3.1. Sensitivity Analysis

Sensitivity analysis was carried out using the change in the total at 1% change of each measure. The results of the calculations for the "With measures" scenario are presented in Table 11.

**Table 11. Change in total of "With Measures" scenario at 1% change of each measure**

| | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|
| 1. Energy | 0.975% | 0.912% | 0.868% | 0.855% |
| B1. Reduction in fuel consumption for transport from the promotion of public transport | 0.011% | 0.020% | 0.023% | 0.022% |
| B2. Reduction in CO2 emissions from road transport from promotion of low CO2 vehicles | 0% | 0.008% | 0.010% | 0.009% |
| C1. Reduction of emissions from manure management from the promotion of AD for animal waste | 0.004% | 0.004% | 0.004% | 0.004% |
| D1. Reduction of emissions from controlled waste management sites from biogas recovery | 0.008% | 0.047% | 0.063% | 0.069% |
| D2. Reduction of emissions from wastewater treatment from the promotion of AD for sewage sludge | 0.002% | 0.003% | 0.003% | 0.002% |
| D3. Reduction of organics to landfill to ≤95 kt by 2020 | 0% | 0.006% | 0.020% | 0.024% |
| D4. Separate organics collection | 0% | 0.001% | 0.004% | 0.005% |
| E1. F-gases recovery | 0% | 0% | 0.005% | 0.009% |

Sensitivity analysis split on total emissions covered by Decision No 406/2009/EC, total emissions included in the scope of the Union's emissions trading scheme established by

Directive 2003/87/EC and total LULUCF emissions (MMR IR Art. 23(2)(b)) is not available.

### 3.3.2. Directive 2003/87/EC and Decision No 406/2009/EC

The total ETS / ESD emissions for the "With measures" projections are presented in Table 12 and Figure 6.

**Table 12. ETS and ESD emissions according to the "With measures" scenario**

| Gg CO2 eq. | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| Total ETS GHGs | 4071 | 4088 | 3330 | 3464 | 3609 |
| Total ESD GHGs | 3903 | 3749 | 3578 | 3610 | 3625 |
| Total GHGs | 7974 | 7836 | 6908 | 7074 | 7233 |

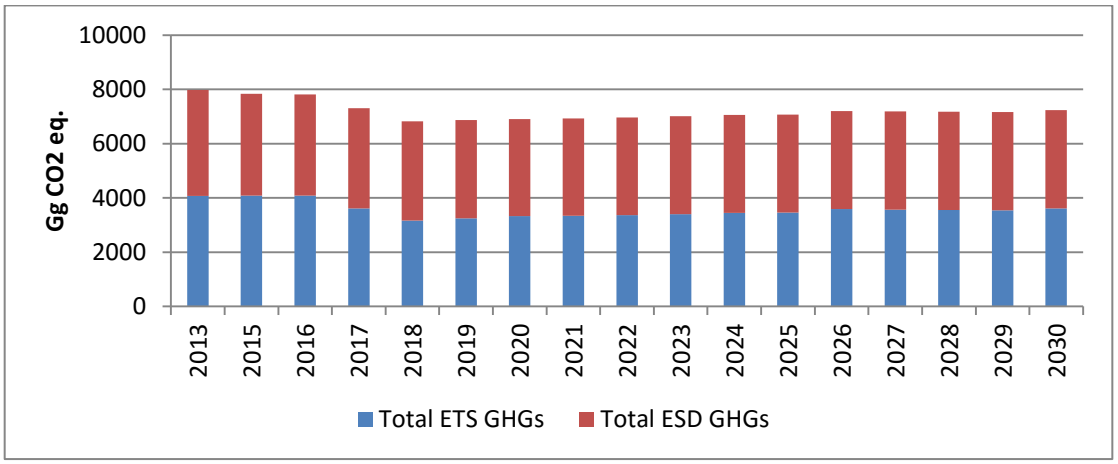


**Figure 6. ETS and ESD emissions according to the "With measures" scenario**

## 3.4. With additional measures

The measures included in the "With additional measures" scenario are listed in Table 13, along with the resulting activity data used for the calculations. Reduction in the emissions is also presented in the table.

All the emission factors and methodologies used are according to the NIR2015. The change in the emissions is presented in Table 14 and Figure 7. The difference in the total emissions between the "Without measures" and the "With additional measures" scenario are presented in Figure 8.

Emissions based on the "with additional measures" scenario are projected to increase by 2% in 2030 compared to 1990 and decrease by 38% compared to 2005. In 2030 the difference between the "with additional measures" scenario and the "without measures" scenario (BaU) is -27%.

**Table 13. Measures included in the "With additional measures" scenario and impact on activity data and emissions**

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ENERGY** | | | | | | | | | | | | | | | | |
| Total electricity production (GWh) | 4252 | 4155 | 4255 | 4365 | 4580 | 4855 | 4855 | 4958 | 5061 | 5165 | 5566 | 5669 | 5772 | 5876 | 5979 | 6082 |
| Electricity production from RES (GWh) | 507 | 699 | 719 | 735 | 755 | 776 | 776 | 1036 | 1296 | 1555 | 905 | 1165 | 1425 | 1684 | 1944 | 2204 |
| Electricity production from conventional fuels (GWh) | 3745 | 3456 | 3536 | 3630 | 3825 | 4079 | 4195 | 4312 | 4428 | 4545 | 4661 | 4504 | 4348 | 4191 | 4035 | 3878 |
| Electricity production from conventional fuels (TJ) | 34827 | 32139 | 32883 | 33758 | 35571 | 37933 | 39016 | 40098 | 41181 | 42263 | 43345 | 41889 | 40433 | 38977 | 37520 | 36064 |
| Gas | 0 | 0 | 0 | 0 | 0 | 14681 | 15101 | 15521 | 15940 | 16360 | 16780 | 16216 | 15653 | 15090 | 14526 | 13963 |
| HFO | 29968 | 27655 | 28295 | 29048 | 30608 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diesel | 4859 | 4484 | 4588 | 4710 | 4963 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduction in emissions (Gg CO2 eq.) | -81 | -145 | -216 | -287 | -368 | 1930 | 1949 | 1966 | 1230 | 1234 | 1237 | 1324 | 1410 | 1496 | 1582 | 1669 |
| **TRANSPORT** | | | | | | | | | | | | | | | | |
| **B1. Reduction in fuel consumption for transport from the promotion of public transport** | **1.9%** | **2.4%** | **2.9%** | **3.4%** | **3.9%** | **4.4%** | **4.52%** | **4.64%** | **4.76%** | **4.88%** | **5.0%** | **6.0%** | **7.0%** | **8.0%** | **9.0%** | **10.0%** |
| Reduction in consumption from B1 (TJ) | 474 | 598 | 719 | 837 | 955 | 1072 | 1099 | 1128 | 1155 | 1179 | 1203 | 1437 | 1669 | 1899 | 2128 | 2355 |
| Fuel consumption (TJ) | 24956 | 24899 | 24779 | 24616 | 24487 | 24374 | 24321 | 24312 | 24266 | 24165 | 24056 | 23946 | 23838 | 23741 | 23648 | 23555 |
| Gasoline | 15003 | 14907 | 14732 | 14516 | 14361 | 14232 | 14167 | 14154 | 14098 | 14002 | 13906 | 13813 | 13727 | 13652 | 13586 | 13523 |
| Diesel | 9656 | 9693 | 9747 | 9798 | 9822 | 9835 | 9847 | 9851 | 9859 | 9852 | 9838 | 9819 | 9795 | 9771 | 9743 | 9711 |
| Biofuels | 298 | 298 | 300 | 302 | 305 | 307 | 308 | 308 | 309 | 310 | 312 | 314 | 316 | 318 | 319 | 320 |
| Reduction in CO2 emissions from B1 (Gg) | 0.0 | 0.0 | 8.4 | 17.4 | 26.4 | 35.4 | 37.5 | 39.6 | 41.7 | 43.7 | 45.6 | 63.4 | 81.1 | 98.7 | 116.1 | 133.4 |
| **B2. Reduction in CO2 emissions from road transport from promotion of low CO2 vehicles** | **2%** | **2.6%** | **3.2%** | **3.8%** | **4.4%** | **5.0%** | **6.0%** | **7.0%** | **8.0%** | **9.0%** | **10.0%** | **10.0%** | **10.0%** | **10.0%** | **10.0%** | **10.0%** |
| Reduction in CO2 emissions from B2 (Gg) | 36 | 46 | 56 | 67 | 77 | 87 | 104 | 121 | 138 | 155 | 171 | 171 | 170 | 169 | 169 | 168 |
| **AGRICULTURE** | | | | | | | | | | | | | | | | |
| **C1. Reduction of emissions from manure management from the promotion of AD for animal waste** | **6.0%** | **6.5%** | **7.0%** | **7.5%** | **8.0%** | **8.5%** | **9.0%** | **9.5%** | **10.0%** | **10.5%** | **11.0%** | **11.5%** | **12.0%** | **12.5%** | **13.0%** | **13.5%** |
| Reduction in emissions from C1 (Gg CO2 eq.) | 11.6 | 12.4 | 13.2 | 13.9 | 14.7 | 15.3 | 16.2 | 17.1 | 18.0 | 18.9 | 19.8 | 20.7 | 21.7 | 22.6 | 23.5 | 24.4 |
| **WASTE** | | | | | | | | | | | | | | | | |
| **D1. Reduction of emissions from** | **10%** | **22%** | **34%** | **46%** | **58%** | **70%** | **70%** | **70%** | **70%** | **70%** | **80%** | **80%** | **80%** | **80%** | **80%** | **80%** |

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **controlled waste management sites from biogas recovery** | | | | | | | | | | | | | | | | |
| Reduction in emissions from D1 (Gg CO2 eq.) | 26 | 59 | 93 | 128 | 166 | 205 | 210 | 215 | 220 | 226 | 265 | 271 | 278 | 285 | 292 | 300 |
| **D2. Reduction of emissions from wastewater treatment from the promotion of AD for sewage sludge** | **6.0%** | **6.5%** | **7.0%** | **7.5%** | **8.0%** | **8.5%** | **9.0%** | **9.5%** | **10.0%** | **10.5%** | **11.0%** | **11.5%** | **12.0%** | **12.5%** | **13.0%** | **13.5%** |
| Reduction in emissions from D2 (Gg CO2 eq.) | 7.9 | 8.7 | 9.6 | 10.3 | 10.8 | 11.5 | 12.3 | 13.0 | 13.7 | 14.3 | 14.8 | 14.7 | 14.6 | 15.1 | 13.6 | 12.9 |
| Domestic (Gg CO2 eq.) | 7.9 | 8.6 | 9.5 | 10.2 | 10.7 | 11.4 | 12.2 | 12.9 | 13.6 | 14.2 | 14.6 | 14.6 | 14.3 | 14.9 | 13.2 | 12.5 |
| Industrial (Gg CO2 eq.) | 0.07 | 0.08 | 0.09 | 0.09 | 0.10 | 0.11 | 0.11 | 0.12 | 0.12 | 0.13 | 0.14 | 0.14 | 0.29 | 0.30 | 0.36 | 0.38 |
| **D3. Reduction of organics to landfill to ≤95 kt by 2016** | | | | | | | | | | | | | | | | |
| BAA kt | 216 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Gg waste to disposal sites | | | | | | | | | | | | | | | | |
| paper, paper pulp and products | 70 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| food waste | 126 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| non-food /garden | 20 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| Reduction in emissions from D3 (Gg CO2 eq.) | 0 | 5 | 20 | 34 | 47 | 60 | 71 | 80 | 89 | 96 | 102 | 106 | 110 | 112 | 114 | 114 |
| **D4. Separate organics collection** | **0%** | **3%** | **5%** | **8%** | **10%** | **12%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** | **15%** |
| BAA separately collected (Gg) | 293 | 285 | 278 | 271 | 262 | 254 | 245 | 236 | 226 | 216 | 206 | 196 | 185 | 174 | 163 | 151 |
| remaining BAA (Gg) | 0 | 9 | 14 | 22 | 26 | 30 | 37 | 35 | 34 | 32 | 31 | 29 | 28 | 26 | 24 | 23 |
| Gg waste to disposal sites | 293 | 276 | 264 | 249 | 236 | 223 | 208 | 200 | 192 | 184 | 175 | 166 | 157 | 148 | 138 | 128 |
| paper, paper pulp and products | | | | | | | | | | | | | | | | |
| food waste | 94 | 89 | 85 | 80 | 76 | 72 | 67 | 65 | 62 | 59 | 57 | 54 | 51 | 48 | 45 | 41 |
| non-food /garden | 171 | 161 | 154 | 145 | 138 | 130 | 121 | 117 | 112 | 107 | 102 | 97 | 92 | 86 | 81 | 75 |
| Reduction in emissions from D4 (Gg CO2 eq.) | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 2.8 | 4.7 | 7.2 | 9.5 | 11.5 | 13.3 | 14.9 | 16.3 | 17.6 | 18.7 | 19.5 |
| **2F Product Uses as Substitutes for Ozone Depleting Substances** | | | | | | | | | | | | | | | | |
| **E1. F-gases recovery** | **0%** | **0%** | **0%** | **0%** | **0%** | **0%** | **1%** | **2%** | **3%** | **4%** | **5%** | **6%** | **7%** | **8%** | **9%** | **10%** |
| Reduction in emissions from E1 (Gg CO2 eq.) | 0 | 0 | 0 | 0 | 0 | 0 | 3.3 | 6.6 | 9.9 | 13.2 | 16.6 | 20.0 | 23.4 | 26.8 | 30.2 | 33.7 |

**Table 14. Changes in the projected emissions from the implementation of the "With measures" scenario**

| | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| **1. Energy** | **5744** | **5645** | **3573** | **3549** | **3262** |
| 1.A.1.a. Public electricity and heat production | 2839 | 2739 | 828 | 946 | 787 |
| 1.A.2. Manufacturing industries and construction | 470 | 612 | 564 | 554 | 545 |
| 1.A.3. Transport | 1936 | 1849 | 1739 | 1607 | 1489 |
| 1.A.3.a. Domestic aviation | 36 | 39 | 67 | 53 | 56 |
| 1.A.3.b. Road transportation | 1898 | 1809 | 1670 | 1552 | 1432 |
| 1.A.3.d. Domestic navigation | 2 | 1 | 2 | 2 | 1 |
| 1.A.4. Other sectors | 499 | 445 | 442 | 441 | 441 |
| 1.A.4.a. Commercial/Institutional | 90 | 78 | 77 | 77 | 76 |
| 1.A.4.b. Residential | 339 | 305 | 303 | 301 | 301 |
| 1.A.4.c. Agriculture/Forestry/Fishing | 70 | 63 | 62 | 63 | 63 |
| **2. Industrial processes** | **1157** | **1464** | **1473** | **1464** | **1454** |
| 2.A. Mineral Industry | 765 | 1080 | 1081 | 1083 | 1084 |
| 2.A. of which cement production | 752 | 1068 | 1068 | 1068 | 1068 |
| 2.A. of which other non-cement production | 13 | 12 | 13 | 14 | 15 |
| 2.D. Non-energy products from fuels and solvent use | 4 | 4 | 4 | 4 | 4 |
| 2.F. Product uses as substitutes for ODS(2) | 327 | 320 | 326 | 315 | 304 |
| 2.G. Other product manufacture and use | 61 | 60 | 61 | 62 | 63 |
| **3. Agriculture** | **579** | **581** | **580** | **576** | **572** |
| 3.A. Enteric fermentation | 229 | 233 | 247 | 247 | 247 |
| 3.B. Manure management | 198 | 182 | 165 | 161 | 156 |
| 3.D. Agricultural soils | 152 | 166 | 168 | 168 | 168 |
| 3.H. Urea application | 0.8 | 0.4 | 0.4 | 0.4 | 0.4 |
| **5. Waste** | **494** | **487** | **421** | **461** | **511** |
| 5.A. Solid Waste Disposal | 445 | 439 | 281 | 227 | 174 |
| 5.B. Biological treatment of solid waste | 0.01 | 0.01 | 0.02 | 0.03 | 0.04 |
| 5.D. Wastewater treatment and discharge | 49 | 48 | 139 | 234 | 337 |
| **TOTAL (excl. LULUCF)** | **7974** | **8177** | **6047** | **6049** | **5800** |
| **Change compared to 1990** | **40%** | **44%** | **6%** | **6%** | **2%** |
| **Change compared to 2005** | **-14%** | **-12%** | **-35%** | **-35%** | **-38%** |
| **Change compared to 2013** | | **3%** | **-24%** | **-24%** | **-27%** |
| **Change compared to BaU projections** | | **0%** | **-26%** | **-21%** | **-27%** |
| **Change compared to WM projections** | | **4%** | **-12%** | **-14%** | **-20%** |

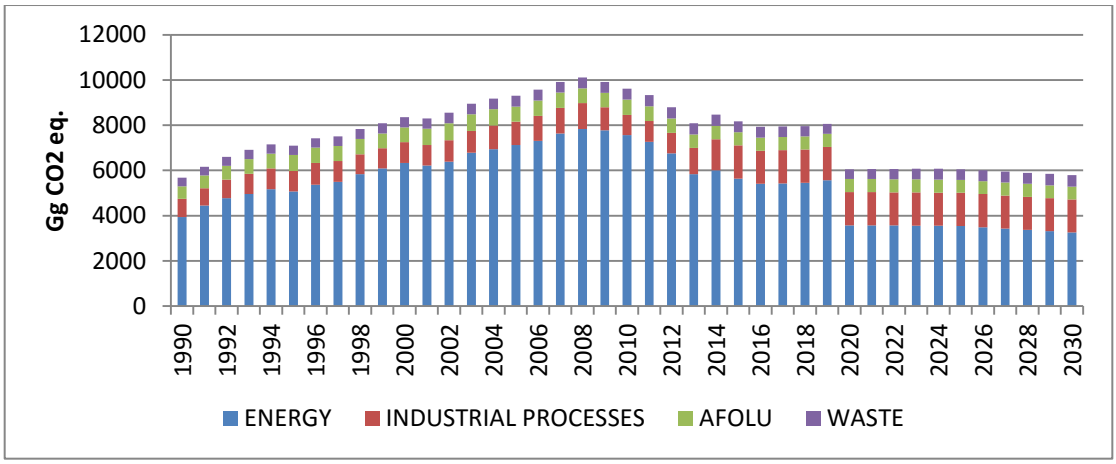


**Figure 7. With additional measures: Total GHG emissions by sector (Gg CO2 eq.) 1990-2030**

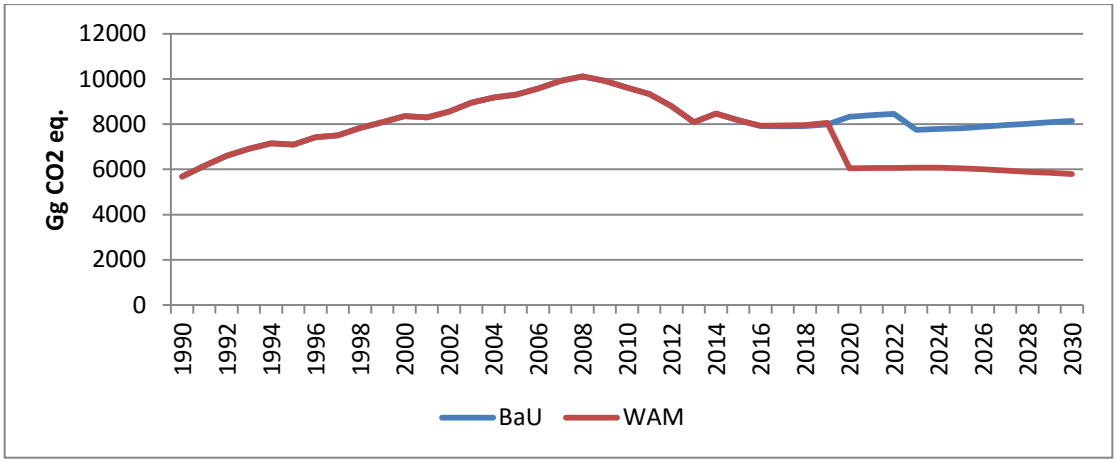


**Figure 8. With additional measures: Total GHG emissions compared to BaU (Gg CO2 eq.) 1990-2030**

**Table 15. With additional measures: Total GHG emissions by gas 2013-2020**

| Gg CO2 eq. | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| CO2 | 6440 | 6611 | 4551 | 4528 | 4251 |
| CH4 | 843 | 831 | 764 | 799 | 842 |
| N2O | 326 | 378 | 371 | 371 | 365 |
| HFCs & SF6 | 327 | 320 | 326 | 315 | 304 |
| **TOTAL** | 7974 | **8177** | **6047** | **6049** | **5800** |

### 3.4.1. Sensitivity Analysis

Sensitivity analysis was carried out using the change in the total at 1% change of each measure. The results of the calculations for the "With measures" scenario are presented in Table 16.

**Table 16. Change in total of "With Additional Measures" scenario at 1% change of each measure**

| | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|
| 1. Energy | 0.972% | 0.920% | 0.862% | 0.847% |
| B1. Reduction in fuel consumption for transport from the promotion of public transport | 0% | 0.007% | 0.010% | 0.025% |
| B2. Reduction in CO2 emissions from road transport from promotion of low CO2 vehicles | 0.012% | 0.017% | 0.036% | 0.032% |
| C1. Reduction of emissions from manure management from the promotion of AD for animal waste | 0.004% | 0.003% | 0.004% | 0.005% |
| D1. Reduction of emissions from controlled waste management sites from biogas recovery | 0.009% | 0.039% | 0.056% | 0.057% |
| D2. Reduction of emissions from wastewater treatment from the promotion of AD for sewage sludge | 0.003% | 0.002% | 0.003% | 0.002% |
| D3. Reduction of organics to landfill to ≤95 kt by 2020 | 0% | 0.011% | 0.022% | 0.022% |
| D4. Separate organics collection | 0% | 0.001% | 0.003% | 0.004% |
| E1. F-gases recovery | 0% | 0% | 0.004% | 0.006% |

Sensitivity analysis split on total emissions covered by Decision No 406/2009/EC, total emissions included in the scope of the Union's emissions trading scheme established by Directive 2003/87/EC and total LULUCF emissions (MMR IR Art. 23(2)(b)) is not available.

### 3.4.2. Directive 2003/87/EC and Decision No 406/2009/EC

The total ETS / ESD emissions for the "With additional measures" projections are presented in Table 17 and Figure 9.

**Table 17. ETS and ESD emissions according to the "With additional measures" scenario**

| Gg CO2 eq. | 2013 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| Total ETS GHGs | 4071 | 4088 | 3330 | 3464 | 3609 |
| Total ESD GHGs | 3903 | 4089 | 2717 | 2585 | 2191 |
| Total GHGs | 7974 | 8177 | 6047 | 6049 | 5800 |

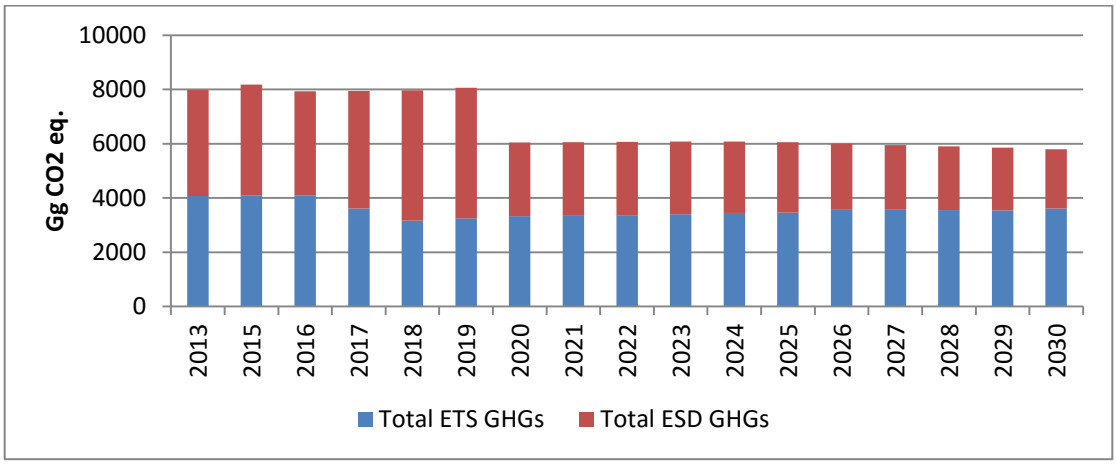


**Figure 9. ETS and ESD emissions according to the "With additional measures" scenario**

## 3.5. Information available to the public (MMR Art. 13(3) and Art. 14(4))

Assessment of the costs and effects of national policies and measures is not available.

Table 4 of Annex XII in MMR has not been applied because a model has not been applied for the purposes of these projections.

Implementation of Union policies and measures that limit or reduce greenhouse gas emissions by sources or enhance removals by sinks is available in the report "Cyprus' climate policies and measures and GHG projections, March 2016" accessible in Greek at the website of the Department of Environment[7].

[7] http://www.moa.gov.cy/moa/environment/environment.nsf/EC029F8F560B17B0C2257F61004BEAFB/$file/PaMs&PROJ-public%20information.pdf

National projections of greenhouse gas emissions by sources and removals by sinks along with relevant technical reports that underpin those projections, including descriptions of the models and methodological approaches used, definitions and underlying assumptions are available in the report "Cyprus' climate policies and measures and GHG projections, March 2016" accessible in Greek at accessible in Greek at the website of the Department of Environment[7].

# Annex I: "Without measures" scenario - activity data

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| GDP-Nominal (€mn) | 17415 | 17795 | 18302 | 18961 | 19688 | 20390 |
| GDP - Real (€mn) | 15145 | 15368 | 15677 | 16026 | 16368 | 16668 |
| Population | 847008 | 850773 | 854393.7 | 857815 | 860977.4 | 863891.5 |
| **Energy** | | | | | | |
| Total electricity production (GWh) | 4252 | 4155 | 4255 | 4365 | 4580 | 5509 |
| Electricity production from RES (GWh) | 507 | 699 | 719 | 735 | 755 | 895 |
| Electricity production from conventional fuels (TJ) | 29087 | 26075 | 25937 | 25907 | 26580 | 12405 |
| Gas | 4716 | 4228 | 4206 | 4201 | 4310 | 23901 |
| HFO | 0 | 0 | 0 | 0 | 0 | 0 |
| Diesel | 0 | 0 | 0 | 0 | 0 | 0 |
| Energy demand (TJ) | 53875 | 55371 | 56343 | 58162 | 59842 | 60398 |
| Air transport - domestic | 540 | 625 | 689 | 796 | 893 | 929 |
| Jet kerosene (total domestic & international) | 10618 | 12290 | 13550 | 15671 | 17571 | 18287 |
| road transport | 9656 | 9693 | 9747 | 9798 | 9822 | 9834 |
| Gasoline | 15003 | 14907 | 14732 | 14516 | 14361 | 14232 |
| Diesel | 9656 | 9693 | 9747 | 9798 | 9822 | 9835 |
| Biofuels | 298 | 298 | 300 | 302 | 305 | 307 |
| cement industry | 6335 | 6241 | 6083 | 5942 | 5852 | 5812 |
| Gas oil | 43 | 43 | 43 | 43 | 43 | 43 |
| RFO | 243 | 245 | 249 | 253 | 256 | 257 |
| Liquefied Petroleum Gas | 47 | 47 | 47 | 47 | 47 | 47 |
| Other solid fuels | 96 | 94 | 91 | 88 | 86 | 85 |
| Biomass | 278 | 281 | 288 | 294 | 299 | 301 |
| Pet-coke | 5236 | 5133 | 4960 | 4802 | 4700 | 4655 |
| Industrial waste (non-renewable) | 392 | 397 | 406 | 415 | 421 | 424 |
| other industries | 1666 | 1670 | 1673 | 1677 | 1681 | 1682 |
| Gas oil | 563 | 565 | 567 | 570 | 573 | 576 |
| RFO | 696 | 700 | 702 | 704 | 705 | 704 |
| Liquefied Petroleum Gas | 234 | 232 | 232 | 231 | 231 | 231 |
| Other kerosene | 87 | 86 | 86 | 86 | 86 | 86 |
| Solid biofuels | 86 | 86 | 86 | 86 | 86 | 86 |
| households | 4573 | 4559 | 4554 | 4555 | 4553 | 4547 |
| Gas oil | 2439 | 2427 | 2420 | 2418 | 2415 | 2410 |
| Liquefied Petroleum Gas | 1463 | 1461 | 1462 | 1465 | 1465 | 1464 |
| Biomass | 278 | 278 | 278 | 279 | 279 | 279 |
| Other kerosene | 393 | 393 | 393 | 394 | 394 | 394 |
| services | 1322 | 1320 | 1318 | 1319 | 1320 | 1319 |
| Gas oil | 558 | 556 | 555 | 555 | 555 | 555 |
| Light Fuel Oil | 3124 | 3121 | 3117 | 3114 | 3112 | 3110 |
| Liquefied Petroleum Gas | 520 | 518 | 517 | 517 | 517 | 516 |
| Biomass | 204 | 205 | 205 | 206 | 207 | 207 |
| agriculture | 1320 | 1313 | 1310 | 1308 | 1307 | 1307 |
| Gas oil | 809.0197 | 802.3067 | 799.3151 | 798.3862 | 797.7153 | 796.9341 |
| Liquefied Petroleum Gas | 47.32756 | 47.32905 | 47.38174 | 47.46999 | 47.53513 | 47.56345 |
| Biomass | 463.693 | 463.5428 | 463.1797 | 462.6411 | 462.2307 | 462.0369 |
| **Industry** | | | | | | |
| Cement production (t) | 2000000 | 2000000 | 2000000 | 2000000 | 2000000 | 2000000 |
| Ceramics production (t) | 100000 | 140000 | 250000 | 450000 | 520000 | 561600 |
| Lime production (t) | 3181 | 3502 | 3824 | 4145 | 4466 | 4787 |
| Lubricant use (t) | 7 | 7 | 7 | 7 | 7 | 7 |
| **Agriculture** | | | | | | |
| Dairy cattle | 0% | 1% | 2% | 3% | 4% | 5% |
| Other cattle | 0% | 1% | 2% | 3% | 4% | 5% |
| Sheep | 0% | 2% | 4% | 6% | 8% | 10% |
| Goats | 0% | 2% | 4% | 6% | 8% | 10% |

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Horses | 0% | 0% | 0% | 0% | 0% | 0% |
| Mules & Asses | 0% | 0% | 0% | 0% | 0% | 0% |
| Swine | 0% | -2% | -4% | -6% | -8% | -10% |
| Poultry | 0% | -1% | -3% | -4% | -6% | -10% |
| Daily milk production (kg) | 17.18 | 17.18 | 17.18 | 17.18 | 17.18 | 17.18 |
| % cows pregnant | 72.24 | 72.24 | 72.24 | 72.24 | 72.24 | 72.24 |
| Total Fertilisers N (t) | 0% | 0% | 0% | 0% | 0% | 0% |
| Agricultural production | 0% | 0% | 0% | 0% | 0% | 0% |
| Wheat | 0% | 0% | 0% | 0% | 0% | 0% |
| Barley | 0% | 0% | 0% | 0% | 0% | 0% |
| Oats | 0% | 0% | 0% | 0% | 0% | 0% |
| Beans & pulses (legumes) | 0% | 0% | 0% | 0% | 0% | 0% |
| Potatoes (tubers) | 0% | 0% | 0% | 0% | 0% | 0% |
| Cultivated area | 0% | 0% | 0% | 0% | 0% | 0% |
| Wheat | 0% | 0% | 0% | 0% | 0% | 0% |
| Barley | 0% | 0% | 0% | 0% | 0% | 0% |
| Oats | 0% | 0% | 0% | 0% | 0% | 0% |
| Beans & pulses (legumes) | 0% | 0% | 0% | 0% | 0% | 0% |
| Potatoes (tubers) | 0% | 0% | 0% | 0% | 0% | 0% |
| Manure management - anaerobic digestion | | | | | | |
| dairy cattle | 8% | 10% | 13% | 15% | 18% | 20% |
| other cattle | 8% | 10% | 13% | 15% | 18% | 20% |
| market swine | 63% | 57% | 50% | 43% | 37% | 30% |
| breeding swine | 63% | 57% | 50% | 43% | 37% | 30% |
| poultry | 12% | 13% | 15% | 17% | 18% | 20% |
| sheep | 0% | 0% | 1% | 1% | 1% | 1% |
| goats | 0% | 0% | 1% | 1% | 1% | 1% |
| horses | 0% | 0% | 1% | 1% | 1% | 1% |
| mules & asses | 0% | 0% | 1% | 1% | 1% | 1% |
| Urea applied to soil | 555 | 555 | 555 | 555 | 555 | 555 |
| **Waste** | | | | | | |
| MSW production (kt) | 546.28 | 553.3 | 563.79 | 573.07 | 581.43 | 589.52 |
| MSW production per capita (kg/cap) | 625.75 | 630.92 | 640.1 | 647.95 | 654.87 | 661.65 |
| Waste to disposal sites (%) | 64.0% | 61.5% | 59.0% | 56.4% | 53.9% | 51.4% |
| MSW production to disposal sites per capita (kg/cap) | 400 | 388 | 377 | 366 | 353 | 340 |
| Waste to managed (%) | 32.2% | 32.2% | 59.3% | 97.0% | 97.0% | 97.0% |
| Waste to unmanaged (%) | 67.8% | 67.8% | 40.7% | 3.0% | 3.0% | 3.0% |
| Composition of waste to disposal site | | | | | | |
| paper, paper pulp and products | 27.0% | 27.0% | 27.0% | 27.0% | 27.0% | 27.0% |
| textiles & fabrics | 11.0% | 11.0% | 11.0% | 11.0% | 11.0% | 11.0% |
| wood | 3.1% | 3.1% | 3.1% | 3.1% | 3.1% | 3.1% |
| food waste | 48.8% | 48.8% | 48.8% | 48.8% | 48.8% | 48.8% |
| non-food /garden | 7.9% | 7.9% | 7.9% | 7.9% | 7.9% | 7.9% |
| other | 2.2% | 2.2% | 2.2% | 2.2% | 2.2% | 2.2% |
| Waste composted (kt) | 59.00 | 66.40 | 74.42 | 82.52 | 90.70 | 99.04 |
| Protein, kg/person/yr | 28.81 | 28.81 | 28.81 | 28.81 | 28.81 | 28.81 |
| well operated centralised, aerobic treatment | 83% | 89% | 89% | 89% | 89% | 89% |
| Industrial production | | | | | | |
| alcohol | 654 | 654 | 654 | 654 | 654 | 654 |
| beer | 32895 | 32895 | 32895 | 32895 | 32895 | 32895 |
| soft drinks | 25981 | 25981 | 25981 | 25981 | 25981 | 25981 |
| dairy products | 100890 | 100890 | 100890 | 100890 | 100890 | 100890 |
| meat & poultry | 83554 | 83554 | 83554 | 83554 | 83554 | 83554 |
| refinery | 0 | 0 | 0 | 0 | 0 | 0 |
| soaps & detergents | 6487 | 6487 | 6487 | 6487 | 6487 | 6487 |
| vegetable oils | 12161 | 12161 | 12161 | 12161 | 12161 | 12161 |
| vegetables, fruits & juices | 54512 | 54512 | 54512 | 54512 | 54512 | 54512 |
| wine | 11531 | 11531 | 11531 | 11531 | 11531 | 11531 |

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|
| GDP-Nominal (€mn) | 21308 | 22266 | 23268 | 24315 | 25410 | 26553 |
| GDP - Real (€mn) | 17084 | 17511 | 17949 | 18398 | 18858 | 19329 |
| Population | 866694 | 869564 | 872461 | 875376 | 878281 | 881212 |
| **Energy** | | | | | | |
| Total electricity production (GWh) | 5677 | 5844 | 6012 | 6179 | 6347 | 6481 |
| Electricity production from RES (GWh) | 895 | 895 | 895 | 895 | 895 | 895 |
| Electricity production from conventional fuels (TJ) | 12595 | 12778 | 0 | 0 | 0 | 0 |
| Gas | 24268 | 24620 | 0 | 0 | 0 | 0 |
| HFO | 0 | 0 | 0 | 0 | 0 | 0 |
| Diesel | 0 | 0 | 0 | 0 | 0 | 0 |
| Energy demand (TJ) | 59782 | 58236 | 57142 | 56431 | 56089 | 55999 |
| Air transport - domestic | 902 | 825 | 773 | 744 | 734 | 736 |
| Jet kerosene (total domestic & international) | 17748 | 16231 | 15217 | 14642 | 14434 | 14478 |
| road transport | 9846 | 9851 | 9859 | 9851 | 9838 | 9819 |
| Gasoline | 14167 | 14154 | 14098 | 14002 | 13906 | 13813 |
| Diesel | 9847 | 9851 | 9859 | 9852 | 9838 | 9819 |
| Biofuels | 308 | 308 | 309 | 310 | 312 | 314 |
| cement industry | 5799 | 5788 | 5765 | 5732 | 5704 | 5679 |
| Gas oil | 43 | 43 | 43 | 43 | 43 | 43 |
| RFO | 257 | 257 | 257 | 258 | 259 | 259 |
| Liquefied Petroleum Gas | 47 | 47 | 47 | 47 | 47 | 47 |
| Other solid fuels | 85 | 85 | 84 | 84 | 83 | 83 |
| Biomass | 301 | 301 | 301 | 302 | 304 | 305 |
| Pet-coke | 4642 | 4632 | 4607 | 4571 | 4540 | 4513 |
| Industrial waste (non-renewable) | 424 | 424 | 425 | 426 | 428 | 430 |
| other industries | 1682 | 1680 | 1678 | 1677 | 1677 | 1677 |
| Gas oil | 577 | 578 | 578 | 579 | 581 | 582 |
| RFO | 702 | 700 | 697 | 694 | 692 | 690 |
| Liquefied Petroleum Gas | 231 | 231 | 231 | 231 | 232 | 232 |
| Other kerosene | 86 | 86 | 86 | 86 | 86 | 86 |
| Solid biofuels | 86 | 86 | 86 | 86 | 86 | 86 |
| households | 4538 | 4532 | 4526 | 4525 | 4526 | 4527 |
| Gas oil | 2404 | 2400 | 2395 | 2394 | 2395 | 2395 |
| Liquefied Petroleum Gas | 1462 | 1461 | 1459 | 1459 | 1459 | 1459 |
| Biomass | 279 | 279 | 279 | 280 | 280 | 280 |
| Other kerosene | 393 | 393 | 392 | 392 | 392 | 392 |
| services | 1318 | 1315 | 1314 | 1313 | 1312 | 1312 |
| Gas oil | 554 | 553 | 552 | 552 | 551 | 551 |
| Light Fuel Oil | 3108 | 3106 | 3104 | 3102 | 3101 | 3099 |
| Liquefied Petroleum Gas | 516 | 515 | 514 | 513 | 513 | 513 |
| Biomass | 208 | 207 | 207 | 208 | 208 | 208 |
| agriculture | 1308 | 1311 | 1313 | 1316 | 1319 | 1321 |
| Gas oil | 798.908 | 801.752 | 803.445 | 806.224 | 808.977 | 810.586 |
| Liquefied Petroleum Gas | 47.6018 | 47.641 | 47.6713 | 47.7024 | 47.731 | 47.7539 |
| Biomass | 461.873 | 461.764 | 461.724 | 461.768 | 461.912 | 462.172 |
| **Industry** | | | | | | |
| Cement production (t) | 2000000 | 2000000 | 2000000 | 2000000 | 2000000 | 2000000 |
| Ceramics production (t) | 606528 | 655050 | 707454 | 764051 | 825175 | 891189 |
| Lime production (t) | 5109 | 5430 | 5751 | 6072 | 6394 | 6715 |
| Lubricant use (t) | 7 | 7 | 7 | 7 | 7 | 7 |
| **Agriculture** | | | | | | |
| Dairy cattle | 5% | 5% | 5% | 5% | 5% | 5% |
| Other cattle | 5% | 5% | 5% | 5% | 5% | 5% |
| Sheep | 10% | 10% | 10% | 10% | 10% | 10% |
| Goats | 10% | 10% | 10% | 10% | 10% | 10% |
| Horses | 0% | 0% | 0% | 0% | 0% | 0% |
| Mules & Asses | 0% | 0% | 0% | 0% | 0% | 0% |
| Swine | -10% | -10% | -10% | -10% | -10% | -10% |
| Poultry | -10% | -10% | -10% | -10% | -10% | -10% |

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|
| Daily milk production (kg) | 17.18 | 17.18 | 17.18 | 17.18 | 17.18 | 17.18 |
| % cows pregnant | 72.24 | 72.24 | 72.24 | 72.24 | 72.24 | 72.24 |
| Total Fertilisers N (t) | 0% | 0% | 0% | 0% | 0% | 0% |
| Agricultural production | 0% | 0% | 0% | 0% | 0% | 0% |
| Wheat | 0% | 0% | 0% | 0% | 0% | 0% |
| Barley | 0% | 0% | 0% | 0% | 0% | 0% |
| Oats | 0% | 0% | 0% | 0% | 0% | 0% |
| Beans & pulses (legumes) | 0% | 0% | 0% | 0% | 0% | 0% |
| Potatoes (tubers) | 0% | 0% | 0% | 0% | 0% | 0% |
| Cultivated area | 0% | 0% | 0% | 0% | 0% | 0% |
| Wheat | 0% | 0% | 0% | 0% | 0% | 0% |
| Barley | 0% | 0% | 0% | 0% | 0% | 0% |
| Oats | 0% | 0% | 0% | 0% | 0% | 0% |
| Beans & pulses (legumes) | 0% | 0% | 0% | 0% | 0% | 0% |
| Potatoes (tubers) | 0% | 0% | 0% | 0% | 0% | 0% |
| Manure management - anaerobic digestion | | | | | | |
| dairy cattle | 21% | 21% | 22% | 22% | 23% | 23% |
| other cattle | 21% | 21% | 22% | 22% | 23% | 23% |
| market swine | 32% | 34% | 36% | 38% | 40% | 42% |
| breeding swine | 32% | 34% | 36% | 38% | 40% | 42% |
| poultry | 21% | 22% | 23% | 24% | 25% | 26% |
| sheep | 1% | 1% | 1% | 1% | 2% | 2% |
| goats | 1% | 1% | 1% | 1% | 2% | 2% |
| horses | 1% | 1% | 1% | 1% | 2% | 2% |
| mules & asses | 1% | 1% | 1% | 1% | 2% | 2% |
| Urea applied to soil | 555 | 555 | 555 | 555 | 555 | 555 |
| **Waste** | | | | | | |
| MSW production (kt) | 598.37 | 607.2 | 616.31 | 625.52 | 634.91 | 644.69 |
| MSW production per capita (kg/cap) | 669.41 | 677.09 | 684.95 | 692.88 | 700.95 | 709.38 |
| Waste to disposal sites (%) | 48.9% | 46.4% | 43.8% | 41.3% | 38.8% | 36.3% |
| MSW production to disposal sites per capita (kg/cap) | 327 | 314 | 300 | 286 | 272 | 257 |
| Waste to managed (%) | 97.0% | 97.0% | 97.0% | 97.0% | 97.0% | 97.0% |
| Waste to unmanaged (%) | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| Composition of waste to disposal site | | | | | | |
| paper, paper pulp and products | 27.0% | 27.0% | 27.0% | 27.0% | 27.0% | 27.0% |
| textiles & fabrics | 11.0% | 11.0% | 11.0% | 11.0% | 11.0% | 11.0% |
| wood | 3.1% | 3.1% | 3.1% | 3.1% | 3.1% | 3.1% |
| food waste | 48.8% | 48.8% | 48.8% | 48.8% | 48.8% | 48.8% |
| non-food /garden | 7.9% | 7.9% | 7.9% | 7.9% | 7.9% | 7.9% |
| other | 2.2% | 2.2% | 2.2% | 2.2% | 2.2% | 2.2% |
| Waste composted (kt) | 107.71 | 116.58 | 125.73 | 135.11 | 144.76 | 154.73 |
| Industrial production | | | | | | |
| alcohol | 654 | 654 | 654 | 654 | 654 | 654 |
| beer | 32895 | 32895 | 32895 | 32895 | 32895 | 32895 |
| soft drinks | 25981 | 25981 | 25981 | 25981 | 25981 | 25981 |
| dairy products | 100890 | 100890 | 100890 | 100890 | 100890 | 100890 |
| meat & poultry | 83554 | 83554 | 83554 | 83554 | 83554 | 83554 |
| refinery | 0 | 0 | 0 | 0 | 0 | 0 |
| soaps & detergents | 6487 | 6487 | 6487 | 6487 | 6487 | 6487 |
| vegetable oils | 12161 | 12161 | 12161 | 12161 | 12161 | 12161 |
| vegetables, fruits & juices | 54512 | 54512 | 54512 | 54512 | 54512 | 54512 |
| wine | 11531 | 11531 | 11531 | 11531 | 11531 | 11531 |

| | 2027 | 2028 | 2029 | 2030 | | |
|---|---|---|---|---|---|---|
| GDP-Nominal (€mn) | 27748 | 28997 | 30302 | 31665 | | |
| GDP - Real (€mn) | 19813 | 20308 | 20816 | 21336 | | |
| Population | 884152 | 887102 | 890089 | 893160 | | |
| **Energy** | | | | | | |
| Total electricity production (GWh) | 6616 | 6750 | 6885 | 7019 | | |
| Electricity production from RES (GWh) | 895 | 895 | 895 | 895 | | |
| Electricity production from conventional fuels (TJ) | 0 | 0 | 0 | 0 | | |
| Gas | 0 | 0 | 0 | 0 | | |
| HFO | 0 | 0 | 0 | 0 | | |
| Diesel | 0 | 0 | 0 | 0 | | |
| Energy demand (TJ) | 56061 | 56114 | 56178 | 56257 | | |
| Air transport - domestic | 746 | 754 | 763 | 773 | | |
| Jet kerosene (total domestic & international) | 14672 | 14844.1 | 15021.6 | 15212.9 | | |
| road transport | 9795 | 9770 | 9743 | 9711 | | |
| Gasoline | 13727 | 13652 | 13586 | 13523 | | |
| Diesel | 9795 | 9771 | 9743 | 9711 | | |
| Biofuels | 316 | 318 | 319 | 320 | | |
| cement industry | 5657 | 5638.02 | 5621 | 5605.87 | | |
| Gas oil | 43 | 43 | 43 | 43 | | |
| RFO | 260 | 260 | 261 | 261 | | |
| Liquefied Petroleum Gas | 47 | 47 | 47 | 47 | | |
| Other solid fuels | 82 | 82 | 81 | 81 | | |
| Biomass | 306 | 306 | 307 | 308 | | |
| Pet-coke | 4488 | 4467 | 4448 | 4431 | | |
| Industrial waste (non-renewable) | 431 | 432 | 433 | 434 | | |
| other industries | 1676 | 1675 | 1674 | 1673 | | |
| Gas oil | 583 | 584 | 584 | 585 | | |
| RFO | 688 | 686 | 684 | 681 | | |
| Liquefied Petroleum Gas | 232 | 233 | 233 | 234 | | |
| Other kerosene | 86 | 86 | 86 | 87 | | |
| Solid biofuels | 86 | 86 | 87 | 87 | | |
| households | 4526 | 4526 | 4525 | 4524 | | |
| Gas oil | 2395 | 2394 | 2394 | 2393 | | |
| Liquefied Petroleum Gas | 1459 | 1458 | 1458 | 1457 | | |
| Biomass | 281 | 281 | 282 | 282 | | |
| Other kerosene | 392 | 392 | 392 | 392 | | |
| services | 1312 | 1311 | 1311 | 1310 | | |
| Gas oil | 551 | 551 | 551 | 550 | | |
| Light Fuel Oil | 3098 | 3097 | 3096 | 3094 | | |
| Liquefied Petroleum Gas | 512 | 512 | 512 | 511 | | |
| Biomass | 208 | 209 | 209 | 209 | | |
| agriculture | 1322 | 1322 | 1323 | 1322 | | |
| Gas oil | 811.304 | 811.366 | 810.788 | 809.45 | | |
| Liquefied Petroleum Gas | 47.772 | 47.786 | 47.7962 | 47.8026 | | |
| Biomass | 462.586 | 463.19 | 464.047 | 465.234 | | |
| **Industry** | | | | | | |
| Cement production (t) | 2000000 | 2000000 | 2000000 | 2000000 | | |
| Ceramics production (t) | 962484 | 1039482 | 1122641 | 1212452 | | |
| Lime production (t) | 7036 | 7357 | 7679 | 8000 | | |
| Lubricant use (t) | 7 | 7 | 7 | 7 | | |
| **Agriculture** | | | | | | |
| Dairy cattle | 5% | 5% | 5% | 5% | | |
| Other cattle | 5% | 5% | 5% | 5% | | |
| Sheep | 10% | 10% | 10% | 10% | | |
| Goats | 10% | 10% | 10% | 10% | | |
| Horses | 0% | 0% | 0% | 0% | | |
| Mules & Asses | 0% | 0% | 0% | 0% | | |
| Swine | -10% | -10% | -10% | -10% | | |
| Poultry | -10% | -10% | -10% | -10% | | |
| Daily milk production (kg) | 17.18 | 17.18 | 17.18 | 17.18 | | |
| % cows pregnant | 72.24 | 72.24 | 72.24 | 72.24 | | |
| Total Fertilisers N (t) | 0% | 0% | 0% | 0% | | |

| | 2027 | 2028 | 2029 | 2030 | | |
|---|---|---|---|---|---|---|
| Agricultural production | 0% | 0% | 0% | 0% | | |
| Wheat | 0% | 0% | 0% | 0% | | |
| Barley | 0% | 0% | 0% | 0% | | |
| Oats | 0% | 0% | 0% | 0% | | |
| Beans & pulses (legumes) | 0% | 0% | 0% | 0% | | |
| Potatoes (tubers) | 0% | 0% | 0% | 0% | | |
| Cultivated area | 0% | 0% | 0% | 0% | | |
| Wheat | 0% | 0% | 0% | 0% | | |
| Barley | 0% | 0% | 0% | 0% | | |
| Oats | 0% | 0% | 0% | 0% | | |
| Beans & pulses (legumes) | 0% | 0% | 0% | 0% | | |
| Potatoes (tubers) | 0% | 0% | 0% | 0% | | |
| Manure management - anaerobic digestion | | | | | | |
| dairy cattle | 24% | 24% | 25% | 25% | | |
| other cattle | 24% | 24% | 25% | 25% | | |
| market swine | 44% | 46% | 48% | 50% | | |
| breeding swine | 44% | 46% | 48% | 50% | | |
| poultry | 27% | 28% | 29% | 30% | | |
| sheep | 2% | 2% | 2% | 2% | | |
| goats | 2% | 2% | 2% | 2% | | |
| horses | 2% | 2% | 2% | 2% | | |
| mules & asses | 2% | 2% | 2% | 2% | | |
| Urea applied to soil | 555 | 555 | 555 | 555 | | |
| **Waste** | | | | | | |
| MSW production (kt) | 654.77 | 665.46 | 676.68 | 688.54 | | |
| MSW production per capita (kg/cap) | 718.07 | 727.38 | 737.18 | 747.55 | | |
| Waste to disposal sites (%) | 33.8% | 31.2% | 28.7% | 26.2% | | |
| MSW production to disposal sites per capita (kg/cap) | 242 | 227 | 212 | 196 | | |
| Waste to managed (%) | 97.0% | 97.0% | 97.0% | 97.0% | | |
| Waste to unmanaged (%) | 3.0% | 3.0% | 3.0% | 3.0% | | |
| Composition of waste to disposal site | | | | | | |
| paper, paper pulp and products | 27.0% | 27.0% | 27.0% | 27.0% | | |
| textiles & fabrics | 11.0% | 11.0% | 11.0% | 11.0% | | |
| wood | 3.1% | 3.1% | 3.1% | 3.1% | | |
| food waste | 48.8% | 48.8% | 48.8% | 48.8% | | |
| non-food /garden | 7.9% | 7.9% | 7.9% | 7.9% | | |
| other | 2.2% | 2.2% | 2.2% | 2.2% | | |
| Waste composted (kt) | 165.00 | 175.68 | 186.76 | 198.30 | | |
| Industrial production | | | | | | |
| alcohol | 654 | 654 | 654 | 654 | | |
| beer | 32895 | 32895 | 32895 | 32895 | | |
| soft drinks | 25981 | 25981 | 25981 | 25981 | | |
| dairy products | 100890 | 100890 | 100890 | 100890 | | |
| meat & poultry | 83554 | 83554 | 83554 | 83554 | | |
| refinery | 0 | 0 | 0 | 0 | | |
| soaps & detergents | 6487 | 6487 | 6487 | 6487 | | |
| vegetable oils | 12161 | 12161 | 12161 | 12161 | | |
| vegetables, fruits & juices | 54512 | 54512 | 54512 | 54512 | | |
| wine | 11531 | 11531 | 11531 | 11531 | | |