

The Austrian Report on Demonstrable Progress

under the Kyoto Protocol

The Report on Demonstrable Progress was compiled by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management.

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Contents

- 1 Introduction 1
- 1 Chapter 1 Domestic Policies and Measures..... 3
 - 1.1 Policy-making Process..... 4
 - 1.2 Policies and Measures by Sector..... 6
- 2 Chapter 2 Trends and Projections of Greenhouse Gas Emissions.....13
 - 2.1 Greenhouse Gas Emission Trends 1990 to 2003..... 14
 - 2.2 Greenhouse Gas Emission Projections to 2020 17
- 3 Chapter 3 Evaluation of the Contribution of Domestic Measures and Use of the Kyoto Mechanisms21
 - 3.1 General Approach to Reach the Kyoto Target..... 22
 - 3.2 Effects of Implemented Policies and Measures 22
 - 3.3 Planned Policies and Measures..... 24
 - 3.4 Use of the Kyoto Mechanisms 26
- 4 Chapter 4 Other Commitments27
 - 4.1 National System for Greenhouse Gas Inventory 28
 - 4.2 National Programmes to Mitigate Climate Change..... 28
 - 4.3 Adaptation Measures 29
 - 4.4 Transfer of Technology 29
 - 4.5 Co-operation on Research and Systematic Observation..... 30
 - 4.6 Public Awareness on Climate Change Issues 31
 - 4.7 Assistance to Developing Countries 31
- 5 Appendix A: References33
- 6 Appendix B: EU Common and Co-ordinated Policies and Measures34

Introduction

Austria is Party to the United Nations Framework Convention on Climate Change (UNFCCC) and Party to the Kyoto Protocol. Austria signed the Kyoto Protocol in April 1998 and ratified it on 31 May 2002 as one of the 15 Member States of the European Union, who have agreed to fulfil their commitments under the Kyoto Protocol jointly according to Art. 4 of the Protocol.

Austria has documented the measures taken to combat climate change in its First National Communication to UNFCCC in 1994 for the first time. Austria has developed a comprehensive national strategy to reduce greenhouse gas emissions and to fulfil its commitments under the Kyoto Protocol (*Climate Strategy*), which was adopted by the Federal Government in 2002. Based on a recent evaluation of its effects, the *Climate Strategy* is currently under review and is going to be amended.

Article 3 paragraph 2 of the Kyoto Protocol requests that each Party included in Annex I shall, by 2005, have made demonstrable progress in achieving its commitments under the Protocol. In line with decisions 22/CP.7 and 25/CP.8 of the UNFCCC this reports provides information on the following issues:

1. Domestic policies and measures, including legal and institutional arrangements for the implementation of the commitments as well as programmes for domestic enforcement;
2. Trends in, and projections of, national greenhouse gas emissions;
3. An evaluation, how domestic measures will contribute to fulfilment of the Party's commitments under Article 3;
4. Activities and actions undertaken in fulfilment of the Party's commitments under Articles 10 and 11.

This report is based on Austria's Fourth National Communication to UNFCCC and contains comparable information, although less extensive. Focus is put on the development of the Austrian climate policy since 1990 and on the progress achieved so far. More detailed information can therefore be found in the Fourth National Communication.

Chapter 1

Domestic Policies and Measures

Due to Austria's federal structure, jurisdiction on measures related to climate change mitigation is distributed between different levels of administration. The following sections describe the policy making process in Austria and policies and measures for the reduction of greenhouse gas emissions since 1990, including the National Climate Strategy adopted in 2002.

1.1 Policy-making Process

1.1.1 Administrative Structures

Austria is a federal state comprised of nine federal provinces. Government responsibilities are shared by three levels of territorial authority, the Federation, the nine federal provinces ("*Länder*") and the municipalities.

Decisions related to policies and measures can be taken at different levels: Legislative measures at the Federation level and the level of the nine *Länder* (federal provinces), administrative measures at federal and *Länder* level, and at the level of districts and municipalities. The Federal Constitution Act contains detailed provisions on the distribution of jurisdictions between the Federation and the *Länder*.

Examples of Federation jurisdiction with respect to climate change are: issues of trade, industry and mining, emissions trading, taxation, price regulation and crisis management for energy supply, transport (e.g. regulations on motor vehicles, infrastructure issues with respect to national railways, roads and waterways). Examples of *Länder* jurisdiction with respect to climate change are: issues of residential building construction and residential heating; road construction and public transport; regional planning. In some important climate change-related policies, jurisdiction is distributed among the Federation and the *Länder*, e.g. energy policy, waste management and agriculture. Policies and measures with respect to climate change at the municipal level range from land-use planning, public transport and local road construction to public buildings and procurement.

Common and co-ordinated policies and measures (CCPMs) to combat climate change are also an element of EU policy. They are implemented and transposed into national law at the appropriate level. CCPMs are mentioned in Section 1.2 and listed in Appendix B.

1.1.2 Institutional Arrangements for Designing a National Climate Change Programme

The Federal Ministry for Agriculture and Forestry, Environment and Water Management has a co-ordinating function with respect to the overall climate change policy in Austria. However, jurisdiction for measures to reduce greenhouse gas emissions and to fulfil the other obligations under the UNFCCC is distributed among several federal ministries and other territorial authorities (*Länder*, municipalities). To support the co-ordination of measures, different committees have been established.

The *Interministerial Committee to Coordinate Measures to Protect Global Climate* (IMC Climate Change) was founded in 1991 during the preparations for the UNFCCC. It is established at the Federal Ministry for Agriculture and Forestry, Environment and Water Management and consists of representatives of the federal ministries concerned by the subject matter, representatives of the Austrian system of social partnership and a common representative of the *Länder*. It advises the Minister for Agriculture and Forestry, Environment and Water Management on matters concerning climate change activities at the federal level, inter alia for those related to the UNFCCC and for editing of the National Communications.

After the negotiation of the Kyoto-Protocol and after Austria had committed itself to the demanding 13% reduction target within the EU burden sharing agreement, the *Kyoto-Forum* was established at the Federal Ministry for Agriculture and Forestry, Environment and Water Management in 1999 as an initiative to combine the efforts of the different levels of state. The *Kyoto-Forum*, comprising high-level representatives of the *Länder* and of the associations of municipalities and towns, shall support and supervise the strategy for reaching the Kyoto-target.

1.1.3 The Role of Climate Policy

Measures to reduce greenhouse gas emissions are embedded in different sectoral policies. These sectoral policies have contributed to combating climate change partly even before the UNFCCC entered into force and are still the relevant framework for developing the national climate policy.

- Energy policy, for example, has recognised the need for energy saving since the 1970ies. A target for reducing CO₂ emissions from energy consumption was incorporated in the Energy Report of the Federal Government at the beginning of the 1990ies. Most CO₂ emissions are energy related and energy policy measures with respect to reducing energy consumption and increasing the share of renewable energy sources are essential for the national climate policy. The measures according to the latest Energy Report of Federal Government are in line with those of the national Climate Strategy.
- Transport policy needs to take account of environmental aspects in general; modernisation of rail infrastructure and measures to improve the modal split in favour of environmentally friendly modes of transport are recognised as being of increasing importance.
- Agriculture and forestry are sources and sinks of greenhouse gases. Promotion of environmentally friendly production methods is an important part of the Austrian agricultural policy and sustainable forest management practices have quite a long tradition in Austria.
- There are also links between climate policy and other areas of environmental policy. Waste management aims at an efficient use of resources, reduction of material flows and minimisation of organic compounds deposited to landfills.

All policies are embedded in a general approach of sustainable development. The Austrian government has adopted the Austrian *Strategy on Sustainable Development* in April 2002. Protection of the climate system is one of the main targets of the strategy, and the Climate Strategy constitutes an integral part of the Strategy on Sustainable Development.

1.1.4 The National Strategy

Based on the results of previous studies and after extensive discussions in the above mentioned committees and in several sectoral working groups Austria's *Climate Strategy 2010* was adopted by the federal government and the council of provincial governors in 2002 (BMLFUW, 2001). After three years of implementation, the effects of *Climate Strategy* have recently been evaluated by independent consultants. The resulting report provides one of the tools to amend the Climate Strategy over the coming months. To that end, three sectoral working groups have been re-established (energy, transport, economic instruments) and are mandated to explore and propose the most promising additional policies and measures that could safeguard Austria's compliance with the Kyoto target during the first commitment period. The package of additional policies and measures in the framework of the *Climate Strategy II* is planned to be adopted by the end of 2006. The planned measures shown in this chapter refer to the draft as of August 2006.

It should be highlighted that most *Länder* (e.g. Vienna, Upper Austria, Lower Austria, Salzburg) already formulated their own regional climate change programmes, taking into account specific regional circumstances, needs and areas of jurisdiction. These programmes ideally supplement the national programme, which can only describe at an abstract level framework conditions and guidelines for provincial action.

1.2 Policies and Measures by Sector

1.2.1 Energy

Measures to reduce greenhouse gas emissions in the energy sector cover both energy demand in the domestic sector and energy supply. Whereas at the time of the First National Communication a large share of measures was in the planning stage, many measures have been implemented during the last ten years. The amendment of the *Climate Strategy*, which is currently negotiated, focuses on an enhancement and reinforcement of some of the measures.

Renewable energy sources have a remarkable share in gross energy consumption, with about 10 % biomass and 10 % hydropower, the latter accounting for about two third of total domestic electricity production. Biomass and biofuels have grown from 9.5 to 10.0 % of gross domestic consumption from 1997 to 2004; wind power, photovoltaics, solar and geothermal energy and heat pumps altogether, although still being on a quite low level, have almost doubled in that period.

Promotion of electricity from renewable energy sources other than large hydro power started in the early 1990ies with a voluntary agreement on preferential feed-in tariffs and subsidies. In the course of the liberalisation of electricity markets a target of 4 % of total domestic electricity production was laid down by law and feed-in tariffs had to

be fixed at *Länder* level. The *Green Electricity Act*, which has entered into effect 2003, aims at an increase of electricity from renewable energy sources other than large hydro power from 70 % in 1997 to the indicative target of 78.1% in 2010 by means of a uniform feed-in tariffs system for Austria. At the same time, the target for “green electricity” was increased to 8 % of total production in 2008 and 10 % in 2010. In addition, a new investment funding scheme has been decided for medium sized hydropower plants (10-20 MW) and highly efficient fossil fuel CHP plants in 2006.

Financial support for rural bio-energy district heating systems is provided by the Federation and the *Länder*; many projects are co-funded by the European Union. From 1990 to 2004, installed power in biomass district heating systems has increased from about 0.2 to 1.1 GW.

A considerable share (about 90 %) of energy industries’ emissions is covered by the European Emissions Trading Scheme, which started in 2005. That instrument is playing an important role for further reducing CO₂ emissions from combustion of fossil fuels. Information can be found in the section on cross-sectoral policies and measures at the end of this chapter.

The strategy to reduce GHG emissions from space heating is based on the following pillars:

- Thermal improvement of existing building stock
- Enhanced technical standards for new buildings
- Increasing share of renewable energy sources and district heating
- Increasing boiler efficiency
- Switching to fuels with lower (fossil) carbon content

Thermal minimum standards for new buildings are defined in the *Technical Construction Regulations* of the *Länder*. An agreement between the *Länder* and the Federation on common minimum standards (“Energy saving agreement”) was concluded in 1980 and amended in 1995; the standards have been further tightened in most *Länder* throughout the last years. A majority of dwellings is constructed or renovated with public support in Austria; the *Länder* administer subsidies of almost 2 billion € annually for *housing support programmes*. In earlier years, these support schemes have lacked thermal quality standards. During recent years, however, all *Länder* have started to introduce specific incentive schemes for energy efficient construction (improved insulation, zero energy houses etc.). Support schemes for thermal renovation of dwellings have been introduced too. An agreement between the *Länder* and the Federation has been concluded in 2005 that provides for further improved standards as a prerequisite for receiving subsidies and for a shift of subsidies in favour of the thermal renovation of existing dwellings.

Financial support is also granted for the replacement of old heating systems by highly efficient systems based on renewable energy, for use of solar energy and for district heating. As a result, for example, solar collector surface has increased by a factor of almost ten since 1990 and amounts to more than 1/3 m² per capita, which ranks among the top in the world.

As far as energy demand of public buildings is concerned, the Federal Government has launched a Programme on Third Party Financing (*Contracting*) for energy-saving investments in federal public buildings. After two years of project management, for

nearly 400 buildings, suitable energy saving contractors have already been found and remarkable results can already be monitored. Similar *Contracting Programmes* also take place in the *Länder*. Several new initiatives are planned to improve conditions and raise the acceptance of this relatively new instrument with respect to public provincial and municipal buildings.

Relatively new instruments are certification schemes for the integrated energy performance of buildings. This kind of certificates is expected to give appropriate price signals on the real estate market since energy consumption of houses, apartments and offices becomes transparent for the consumer. The respective requirements of the EU Directive on the Energy Performance of Buildings (2002/91/EC) are currently transposed into national law in Austria.

With respect to public awareness, numerous campaigns concerning domestic energy saving have been performed at Federal, *Länder* and municipal level and by NGOs; advising services by publicly funded energy agencies and training programmes for specific target groups have been established and have become increasingly popular throughout the last decade. In 2004 the climate change initiative *klima:aktiv* has been initiated by the Ministry of Environment. Several thematic programmes have been launched in the framework of *klima:aktiv*, which cover inter alia the areas construction, energy efficiency, and renewable energy sources. The initiative combines various market-constituent measures and effectuates target-oriented implementation, by providing easier access to target groups and resources for attaining the commonly set targets, by enhanced transfer of know-how with support in vocational training and networking of important actors, by the organisation and development of quality assurance and standards as well as by target group-specific information and marketing.

1.2.2 Waste Management

Methane emissions from waste management sources in Austria have decreased by about one third from 1990 to 2004. This is mainly due to improved landfill gas recovery, for which public funds have been made available, and rising quota of separate collection and treatment of waste. Very strict limits on the total organic carbon content regarding waste deposited to landfills have finally been set in the *Landfill Regulation*, which has been enacted in 1996.

Energy recovery from waste is one of the targets of Austrian waste policy, which is beneficial for CO₂ emission reduction in other sectors. Heat from waste incineration supplied to district heating networks, for example, reduces emissions from households. Therefore, federal subsidies have been introduced for highly efficient incineration plants.

Apart from legislation and subsidies, sector-specific concepts for waste prevention and recovery have been developed and several programmes and initiatives for realising waste minimisation potentials have been implemented at Federation and *Länder* level.

1.2.3 Transport

Different from other sectors with more or less stable or decreasing emissions trends since 1990, the transport sector in Austria shows an extraordinary growth. CO₂ emissions from transport have been growing by almost 90 % from 1990 to 2004. The trend, however, is to a large extent related to the increase of fuel which is sold in Austria but consumed outside Austria (“fuel tourism”). This is due to the fact that price differences in relation to most neighbouring countries have been growing since the mid 1990ies. Important routes for long-distance freight traffic cross Austria and the integration of eastern neighbour states into the European economic area has led to additional traffic demand especially on transit routes.

Policies and measures aim to stabilise and reverse the current emissions trend. A mix of different instruments, such as regulatory, fiscal and awareness-raising has been introduced since the beginning of the 1990ies under participation of all levels of policy-making.

A fuel consumption based passenger car registration levy was introduced in the early 1990ies; annual current taxes – based on motor power and, therefore, indirectly on fuel consumption – have been increased considerably in 2000. A mileage based highway toll for lorries and trucks was introduced in 2004. A mandatory target of a 5.75 % share of biofuels for transport fuels, to be reached step by step until 2008, has entered into force in 2004. Labelling of new passenger cars with respect to their fuel consumption is compulsory since 2001, in order to allow consumers making their choice for “climate friendly” cars. The labelling scheme is an element of an EU strategy to bring down average CO₂ emissions from new passenger cars to 120 g/km; an other element is the conclusion of agreements between the European Commission and European, Japanese and Korean associations of car manufacturing industries to reduce average fuel consumption of cars sold by these manufacturers.

Considerable public funds have been allocated to the extension and modernisation of the railway infrastructure in the 1990ies; infrastructure enhancement and other promotional measures have also been performed in favour of combined freight transport. Public authorities have promoted unified fares systems for passenger transport; since the end of the 1990ies the areas of 8 transport and tariff associations cover the whole of Austria. During the last years the *Länder* in co-operation with municipalities have started to optimise the public transportation network based on comprehensive regional traffic concepts.

Model projects and programmes for environmentally sound mobility have been initiated in the 1990ies, aiming at a reallocation of passenger transport from private cars towards public transport services, cycling and walking. Projects have been established in the fields of tourism and mobility management. R&D programmes have focused on e.g. transport technology, telematic applications and logistic systems. In 2005, measures focused on raising public awareness with regard to climate-friendly modes of mobility and consulting services for mobility management in companies, public institutions, schools and on regional level have been brought together and enhanced under the label *klima:aktiv→mobil* by the Ministry of Environment together with partners.

1.2.4 Industry

Mitigation measures in industry focus on CO₂ emissions, as Austrian industry causes only small proportions of N₂O emissions. Starting in the 1980ies, energy consulting services have been provided free of charge for industry, funded by the Federation and some *Länder*. Financial support is available under the Environmental Support Act for energy saving measures and the use of renewable energy sources in industry; specific attention had been given to combined heat and power plants in the 1990ies.

A considerable share of industry emissions (about 80 %) is covered by the European Emissions Trading Scheme, which started in 2005. That instrument will play the most important role with respect to industry's greenhouse gas mitigation. Information can be found in the section on cross-sectoral policies and measures at the end of this chapter. Measures related to fluorinated gases have been enacted in 2002 and have impacts on some industrial branches; more information can be found in the section on cross-sectoral policies and measures.

1.2.5 Agriculture and Forestry

Since the 1990ies measures within the Austrian Programme for Environmentally Compatible Agriculture (*ÖPUL*), which is co-financed by the EU, have gained increasing importance to reduce greenhouse gas emissions from agriculture. Subsidies are granted for especially environment-friendly and sustainable approaches to agriculture, e.g. manure management (which reduces methane emissions), reduced use of mineral fertilisers (which reduces N₂O emissions from soils) and organic farming. The number of organic farms has increased by a factor of more than 10 since 1990; almost one tenth of arable land is managed according to organic criteria. As an accompanying measure, training programmes for farmers on ecologically sound production methods are provided.

Given the fact that Austria is one of the most densely wooded countries in Central Europe with forests covering more than 47% of the federal territory, the possibilities to increase carbon sinks by increasing forest cover are limited. Nevertheless, forest area has still increased by some percent since the first forest inventory in the 1960ies. It has been a guiding principle of Austrian forest management policy for more than 100 years to use forests in an economically sustainable manner, balancing the relevant ecological, economic and social functions. Austrian forest management mainly focuses on the targets to maintain the biodiversity, productivity, regeneration capacity and vitality of forests and to improve adaptation to changing – specifically climatic – conditions.

Products of agriculture and forestry are also of considerable importance to reduce energy related emissions in other sectors. Austria's fossil CO₂ emissions would be considerably higher without wood as an energy source for space heating, without oil-

seeds from rape and sun flower to substitute diesel in the transport sector, and without biogas and solid biomass for combined heat and power generation.

1.2.6 Cross-cutting Policies and Measures

As substitutes for the “Montreal gases”, HFCs increased steadily between 1990 and 1999, without a trend reversal in sight for coming years. Also for SF₆ a considerable increase was expected for the future. That was why the Austrian Ordinance on Fluorinated Gases was enacted, which entered into force in 2002. The ordinance was designed to reduce and phase-out the use of HFCs, PFCs and SF₆ in all relevant applications. HFCs for the production of insulation material, construction foams and refrigeration and air conditioning appliances and the use of these products, SF₆ in sound-absorbing windows, in tires and insulated switchgear installations and semi-conductors and the use of fluorinated gases in fire-fighting systems are concerned. In order to give incentives to the market for “early phase-out”, prior to full entry into force of the above-mentioned regulation, the Federation and the *Länder* are capable to refrain from the use of products equipped with fluorinated gases within public procurement guidelines. Some *Länder* grant subsidies according to their housing support schemes only when no construction products containing fluorinated gases are used.

As energy prices affect the amount of energy consumption, energy taxes are widely used to influence energy consumption and the share of energy sources. Austria introduced an energy tax on electricity and natural gas in 1996 and increased the tax rate for electricity in 2000. Existing taxes on natural gas and mineral oil for heating purpose were increased significantly in 2004, a tax on coal was introduced. Whereas fossil transport fuels are subject to tax, biofuels are exempt.

By implementation of EU directive 2003/87/EC, the European Emissions Trading Scheme (EU ETS) entered into effect by 1 January 2005. About 200 energy intensive installations from industry and energy production sectors are covered by the scheme in Austria. The emissions cap for the EU ETS sectors during the pilot trading phase 2005-2007 provides for CO₂ emissions reductions of approximately 1.65 Mt (in comparison to business as usual scenarios). Excess emissions need to be compensated by purchase of additional allowances on the market. The National Allocation Plan for the second trading phase is currently under preparation. The instrument is one of the major tools for Member States to comply with Kyoto Protocol targets during the commitment period 2008-2012.

Chapter 2

Trends and Projections of Greenhouse Gas Emissions

Austria's greenhouse gas emissions show a rising trend between 1995 and 2003, which is caused to a high extent by emissions from road transport and to some extent by increasing electricity demand as well as industry production. Details on the sectoral emissions and projected future development are shown on the following pages.

2.1 Greenhouse Gas Emission Trends 1990 to 2003

As reported in Austria's 2005 inventory submission to the UNFCCC (Anderl et al., 2005), total greenhouse gases showed an increase of 16.6% from the base year to 2003. In the period from 1999 to 2003 Austria's total greenhouse gases increased by 13.9%. In 2003 Austria's CO₂ emissions amounted to 76.21 Tg, which is an 83% share of all greenhouse gas emissions. Total emissions of the greenhouse gases CO₂, N₂O, CH₄, HFCs, PFCs and SF₆ were 91.6 Tg CO₂ equivalent in the year 2003, with the transport sector contributing about one quarter of total emissions, followed by energy industries and other energy sectors¹ with about one sixth each (see also Table 2.1).

CH₄ emissions decreased by one fifth and N₂O emissions decreased slightly, but the trend of total greenhouse gases is dominated by the 24 % increase of CO₂ emissions, which occurred mainly since 2000 (see Figure 2.1).

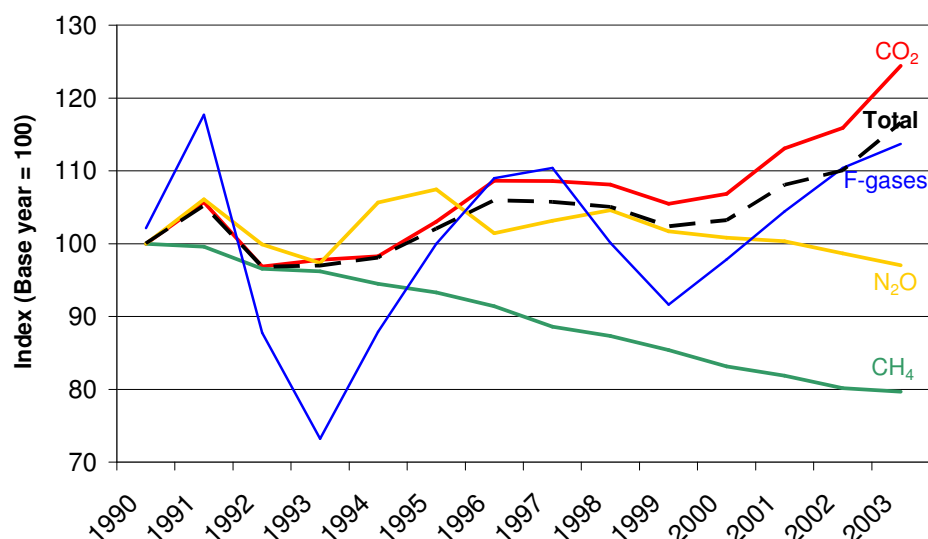


Figure 2.1: GHG emission trend (excluding land-use change and forestry), split into gases

Emission trends are quite different for the individual sectors (see Figure 2.2). An analysis of the driving forces for the emission trends was performed in the first assessment report on the implementation of the National Climate Strategy (Benke et al., 2006). Results of the analysis are shown below together with the trends.

The energy sector is responsible for 76 % of total greenhouse gas emissions in 2003 and exhibits a 26 % increase of emissions from the base year to 2003, which is mainly due to a strong increase of emissions from the sub-sector transport.

¹ The subsector 'Other Sectors' comprises Commercial/Institutional, Residential and Agriculture/Forestry/Fisheries.

Emissions from sub-sector *energy industries* are 18 % higher in 2003 compared to 1990. An important reason for the increase are different weather conditions in these years, which have led to considerably lower electricity production from hydro power in 2003. The resulting substitution of hydro power by thermal power can explain the difference in emissions. Apart from weather, other factors like the increase in the demand for electricity (by one third) and for heat from district heating (which has doubled) would have led to an emission increase by one third; that increase was compensated by reduced fuel intensity in public power and heat plants, by increased use of biomass in district heating plants, by reduced carbon intensity of fossil fuels as well as by an increase of electricity imports to meet the higher electricity demand.

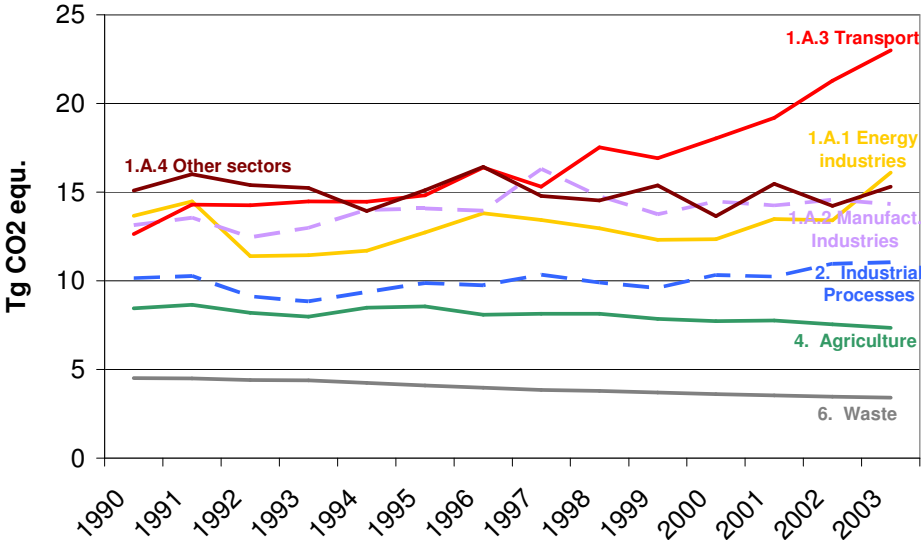


Figure 2.2: GHG emission trend split into sectors

Emissions from *manufacturing industries and construction* increased by 9 %, just as emissions from *industrial processes* did. The increase was considerably lower than the increase in industrial production; the production of steel, for example, increased by almost 50 % in that period, the growth of industrial production in the other branches was more than two times higher than that of CO₂ emissions. The increase in production value would let expect an emission increase of about one fourth, but this effect was partly compensated inter alia by reduced carbon intensity of the fossil fuels used and by increased use of renewable fuels.

Emissions from *transport* have almost doubled with a 83 % increase from 1990 to 2003, although transport demand in Austria has increased considerably less. The rise in emissions is caused to a large extent by road fuel sold in Austria but consumed abroad (“fuel tourism”). Figure 2.3 shows a comparison of greenhouse gas emissions from road transport on Austrian roads and emissions calculated on basis of fuel sold in Austria. The increase in (domestic) transport demand alone would have led to an emission increase by about one third, which was partly compensated by a decrease in fuel consumption per kilometre; that is why emissions from domestic transport increased by about 20 %.

Table 2.1: Emissions 1990 to 2003 by gases and by sectors (in Tg CO₂ equivalent)

GREENHOUSE GAS EMISSIONS	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CO ₂ emissions (without LUCF)	61.26	61.26	64.75	59.35	59.90	60.20	63.12	66.56	66.53	66.22	64.61	65.45	69.28	70.99	76.21
<i>Net CO₂ emissions/removals</i>	<i>52.25</i>	<i>52.25</i>	<i>52.98</i>	<i>50.91</i>	<i>51.14</i>	<i>52.56</i>	<i>56.07</i>	<i>61.37</i>	<i>54.84</i>	<i>53.51</i>	<i>51.98</i>	<i>51.81</i>	<i>55.93</i>	<i>59.68</i>	<i>63.44</i>
CH ₄	9.80	9.80	9.76	9.46	9.43	9.26	9.14	8.96	8.68	8.56	8.37	8.15	8.02	7.86	7.81
N ₂ O	5.71	5.71	6.06	5.71	5.56	6.03	6.14	5.79	5.89	5.97	5.81	5.76	5.73	5.64	5.54
HFCs	0.56	0.22	0.33	0.39	0.44	0.51	0.56	0.64	0.73	0.81	0.87	1.02	1.12	1.22	1.31
PFCs	0.07	1.08	1.09	0.46	0.05	0.06	0.07	0.07	0.10	0.04	0.06	0.07	0.08	0.09	0.10
SF ₆	1.14	0.50	0.65	0.70	0.79	0.99	1.14	1.22	1.12	0.91	0.68	0.63	0.64	0.64	0.59
Total (without CO₂ from LUCF)	78.54	78.57	82.65	76.06	76.18	77.05	80.16	83.24	83.05	82.51	80.40	81.08	84.87	86.43	91.57
<i>Total (with net CO₂ emissions/removals)</i>	<i>69.52</i>	<i>69.56</i>	<i>70.87</i>	<i>67.63</i>	<i>67.42</i>	<i>69.41</i>	<i>73.11</i>	<i>78.05</i>	<i>71.36</i>	<i>69.81</i>	<i>67.77</i>	<i>67.44</i>	<i>71.53</i>	<i>75.12</i>	<i>78.79</i>

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1. Energy	54.95	54.95	58.77	53.93	54.57	54.54	57.20	61.02	60.28	60.29	58.87	59.01	62.93	64.03	69.33
1.A.1 Energy Industries	13.67	13.67	14.47	11.39	11.43	11.69	12.73	13.81	13.42	12.95	12.31	12.33	13.49	13.41	16.11
1.A.2 Manufact. Ind. and Construction	13.14	13.14	13.56	12.45	12.99	14.00	14.09	13.95	16.31	14.78	13.75	14.48	14.25	14.58	14.34
1.A.3 Transport	12.64	12.64	14.29	14.27	14.47	14.45	14.83	16.39	15.30	17.52	16.91	18.04	19.18	21.28	23.00
1.A.4 Other Sectors	15.08	15.08	16.02	15.39	15.24	13.94	15.11	16.43	14.77	14.54	15.37	13.64	15.48	14.23	15.30
1.A.5 Other	0.04	0.04	0.04	0.03	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04
1.B Fugitive Emissions from Fuels	0.38	0.38	0.39	0.40	0.40	0.41	0.42	0.38	0.43	0.45	0.49	0.47	0.49	0.48	0.55
2. Industrial Processes	10.11	10.15	10.27	9.12	8.84	9.38	9.88	9.75	10.35	9.90	9.59	10.33	10.23	10.96	11.05
3. Solvent and Other Product Use	0.52	0.52	0.47	0.42	0.42	0.40	0.42	0.41	0.42	0.40	0.39	0.41	0.43	0.43	0.43
4. Agriculture	8.46	8.46	8.64	8.19	7.97	8.49	8.56	8.09	8.14	8.15	7.86	7.72	7.75	7.55	7.35
5. Land-Use Change and Forestry	-9.01	-9.01	-11.77	-8.43	-8.76	-7.64	-7.05	-5.19	-11.69	-12.71	-12.64	-13.65	-13.34	-11.31	-12.77
6. Waste	4.50	4.50	4.50	4.40	4.37	4.24	4.10	3.97	3.85	3.78	3.70	3.60	3.53	3.47	3.41
7. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

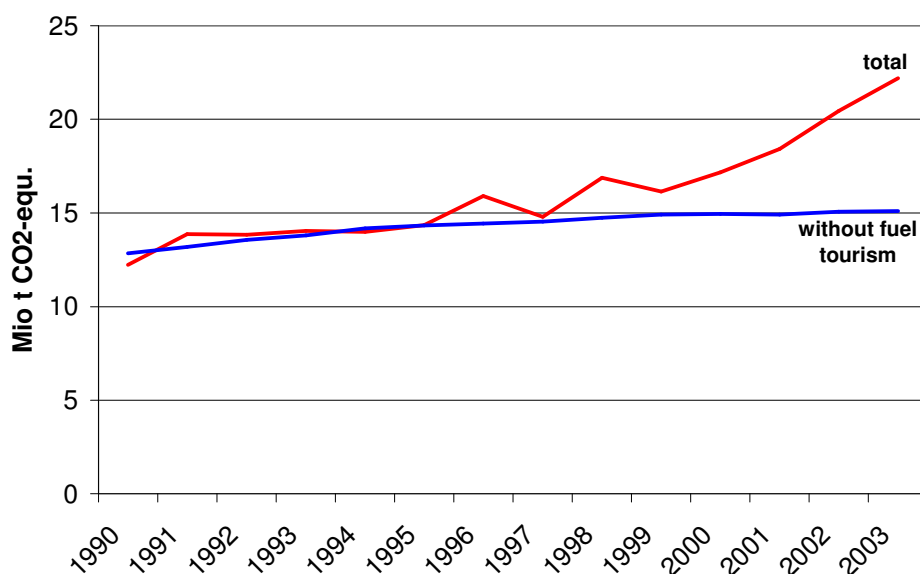


Fig 2.3: Greenhouse gas emissions of road transportation – total and without fuel tourism.

Emissions from *other sectors* (i. e. combustion in the residential, institutional, commercial and agriculture sector) in 2003 were on a level comparable to that of the base year. Emissions from space heating are slightly higher in 2003 compared to 1990; the increase is mainly due to different weather conditions in these years. If a correction for heating degree days is applied, the emissions are on virtually the same level in both years. Emissions would have increased by about 20 % due to the increase in number and average size of dwellings; that increase was compensated by improved carbon intensity of fossil fuels (mainly a switch from coal to gas), improved boiler efficiency, increased share of district heating and a lower energy demand per square metre living-space.

Emissions from the sectors agriculture and waste show a downward trend. The 13 % decrease of emissions from agriculture is due to decreasing livestock numbers and reduced fertiliser use. Emissions from waste decreased by about one fourth, mainly because the amount of landfilled waste has decreased and methane recovery from landfills has been improved.

2.2 Greenhouse Gas Emission Projections to 2020

For the amendment of Austria's National Climate Strategy, efforts have been undertaken to estimate the development of greenhouse gas emissions according to implemented and adopted measures and the effect of planned measures. These most recent figures (mid 2006) from the draft National Climate Strategy II are based on energy projections, CO₂ projections for the EU-ETS sectors and expert judgements and are available for the year 2010. (The draft Climate Strategy II has not yet been adopted by the Austrian Federal Government.)

In addition, model calculations have been performed in 2005, which provide a "With Measures" scenario and a "With Additional Measures" scenario up to 2020. The calculations have been performed by the Austrian Institute of Economic Research

and by the Umweltbundesamt; the model for emission calculations is based on the methods of the emissions inventory.

2.2.1 Projections According to the Draft National Climate Strategy II

In the framework of a consensual process to formulate an amendment to the National Climate Strategy ("Climate Strategy II") towards the Kyoto target under the EU burden sharing agreement, model based projections in combination with experts' judgements have been utilized to determine the expected development of greenhouse gas emissions according to the structure of the draft strategy. The figures reflect not only the outcome of the energy projections of the Austrian Institute of Economic Research (Kratena, 2005) and bottom-up calculations from the assessment report on the implementation of the "Climate Strategy I" (Benke et al., 2006). They also take into account recent CO₂ emissions projections for the sectors of the EU emissions trading scheme (Dunkel et al., 2006), which were the basis for an interministerial consensus on the Second National Allocation Plan.

Results from the draft Climate Strategy II are shown in Table 5.1. Total greenhouse gas emissions are expected to be slightly higher than 90 Tg CO₂ equivalent in 2010 with implemented and adopted measures and to be substantially lower (around 77 Tg) with planned measures. As indicated in Table 5.1, the Kyoto Target can only be reached by substantial use of the Kyoto Mechanisms (8-9 Tg annually).

Table 2.2: Projected total emissions according to expert judgements for the draft National Climate Strategy II (in Tg CO₂ equivalent)

	Emissions				With Measures	With Add. Measures
	1990	1995	2000	2004	2010	2010
Energy demand (CO ₂ +N ₂ O+CH ₄)	15.07	15.3	13.9	14.7	14.4	10.8
Energy supply (CO ₂ +N ₂ O+CH ₄)	13.71	12.7	12.5	15.6	17.3	13.6
Waste (CO ₂ +N ₂ O+CH ₄)	3.56	3.1	2.6	2.6	2.2	2.1
Transport (CO ₂ +N ₂ O+CH ₄)	12.76	14.9	18.1	23.9	21.7	16.9
Industry (CO ₂ +N ₂ O+CH ₄ , incl. process)	22.11	22.6	23.4	23.8	26.9	25.2
Agriculture (CH ₄ +N ₂ O)	9.12	9.1	8.3	7.9	7.7	7.2
HFCs, PFCs, SF ₆	1.60	1.5	1.3	1.5	1.4	1.4
other (incl. solvent use)	1.00	1.0	1.1	1.3	0.9	0.9
Land-use, land-use change and forestry (Art. 3.3 KP)					-0.7	-0.7
Total	78.94	80.2	81.3	91.3	91.7	77.3

2.2.2 Projections from the Inventory Methods Based Model

Greenhouse gas emission scenarios have been developed by the Umweltbundesamt (Anderl et al., 2006). The underlying energy scenarios have been calculated by the Austrian Institute of Economic Research as part of a contract with the Federal Ministry of Agriculture, Forestry, Environment and Water Management; these calculations are based on earlier work that had been commissioned by the Federal Ministry of Economics and Labour (Kratena and Wüger, 2005). The "With Measures" scenario comprises implemented and adopted policies and measures up to January 2005 as described in the previous chapter, but no new measures. It is based on

expectations of a continuing growth of population and number of households, growth of GDP of about 2 % and of production value in manufacturing industries of about 3 % annually. The number of cattle is expected to decrease slightly; the amount of landfilled waste will stay more or less constant in the projection period compared to the considerable decrease since 1990. (See also Table 2.3)

Table 2.3: Key variables and trends of the model calculations

	1990	1995	2000	2005	2010	2015	2020
GDP growth, real 2000 [mill. €]	144 584	162 246	187 707	201 604	224 998	250 861	276 970
GDP growth, real 2000 [%]	+5.0	+ 2.2	+ 4.0	+2.2	+2.2	+2.2	+2.0
Production value growth in manufact. indust., real 2000 [%]	~ + 2.7			~ + 3.2		+3.3	
Oil price Brent, real 2000 [€/bbl]				26.12	30.87	30.87	30.87
Population [million pers.]	7.68	7.95	8.01	8.13	8.26	8.35	8.40
Number of dwellings [million]	3.27	3.42	3.63	3.74	3.81	3.92	4.03
cattle [1000 head]	2 584	2 326	2 155	1 989	1 941	1 905	1 896
waste deposition [1000 tons]	2 859	1 912	1 980	971	794	810	823

The overall results of the calculations show that emissions are expected to decrease slightly by about 3 Tg from 2003 to 2010 and to rise again after 2010 (see Table 2.4).

Table 2.4: Past and projected GHG emissions by gas and by CRF sector (in Tg CO₂ equ.)

	Inventory data				Projections			
	1990	1995	2000	2003	2005	2010	2015	2020
CO ₂	61.26	63.12	65.45	76.21	75.03	76.63	79.30	83.56
CH ₄	9.80	9.14	8.15	7.81	7.74	7.19	6.81	6.61
N ₂ O	5.71	6.14	5.76	5.54	4.77	4.64	4.62	4.62
F-Gases	1.80	1.77	1.72	2.00	1.47	1.47	1.37	1.47
Energy industries & fugit. emiss.	14.05	13.15	12.81	16.66	15.56	17.20	18.59	21.69
Manufacturing industries	13.14	14.08	14.48	14.34	14.96	15.58	16.51	17.54
Transport	12.64	14.83	18.04	23.00	22.02	21.58	22.14	22.87
Other sectors	15.12	15.14	13.69	15.34	15.00	14.40	13.75	12.71
Industrial processes & solvents	10.66	10.31	10.74	11.47	10.89	11.13	11.4	11.91
Agriculture	8.46	8.56	7.72	7.35	7.29	7.26	7.33	7.38
Waste	4.50	4.10	3.60	3.41	3.30	2.78	2.39	2.16
Total	78.57	80.16	81.08	91.57	89.01	89.93	92.10	96.26

The projections of the draft Climate Strategy II presented in the previous section and the model calculations show comparable trends (see Figure 2.4).

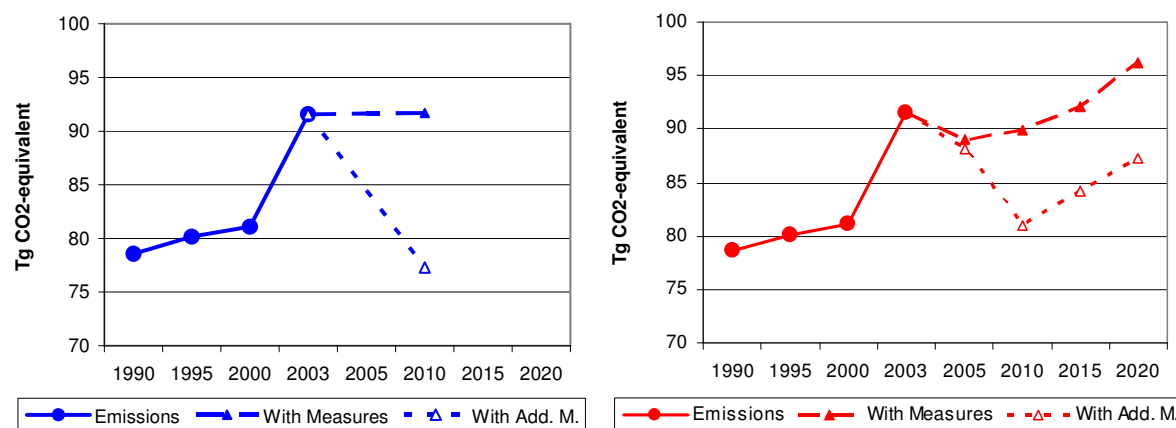


Figure 2.4: Greenhouse gas emissions in Austria – projections according to the expert judgments of the draft Climate Strategy II (left) and the inventory methods based model (right)

As for the past emissions trend, the projected trend is dominated by CO₂. Emissions of CH₄ and N₂O show a falling trend and F-gases altogether stay fairly constant, whereas CO₂ emissions increase after 2010 (see Figure 2.5).

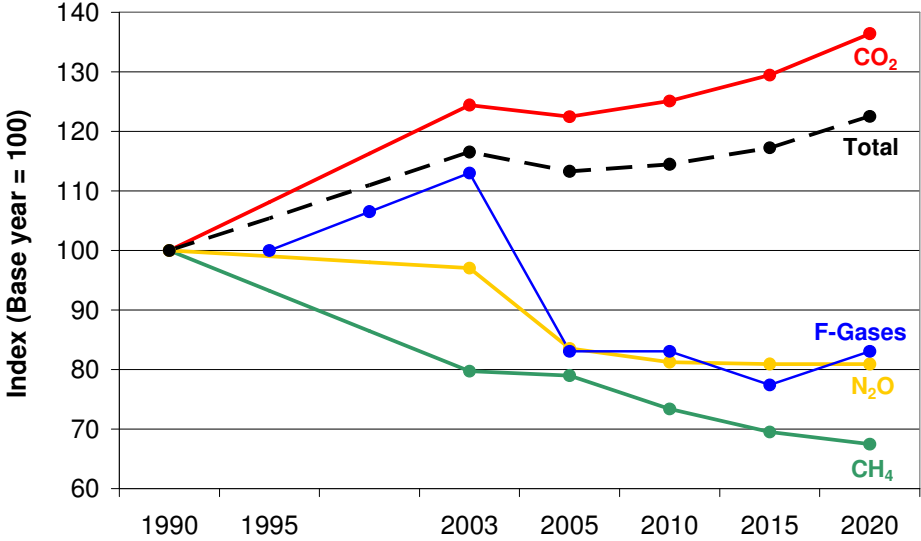


Fig. 2.5: GHG emission projections (without LUCF), split by gas

The projected development is dominated by the subsectors energy industries and transport (cf. Fig. 2.6). After the enormous increase of transport emissions during the last years, which is caused to a high extent by fuel tourism, fuel tourism is expected to stagnate. That effect together with the biofuel directive leads to a slight decrease of emissions until 2010; in the long-term, growing transport demand is expected to raise emissions again. Emissions from energy industries are driven by continuously rising electricity demand, which is projected to increase by 50 % from 2003 to 2020. Emissions from manufacturing industries and construction as well as emissions from industrial processes are projected to increase at a lower rate than industrial production. Energy saving measures and use of renewable energy sources in the residential and commercial sector are expected to lead to decreasing emissions in the near future. The decreasing emission trend in the waste sector is expected to continue, that in the agriculture sector to stagnate.

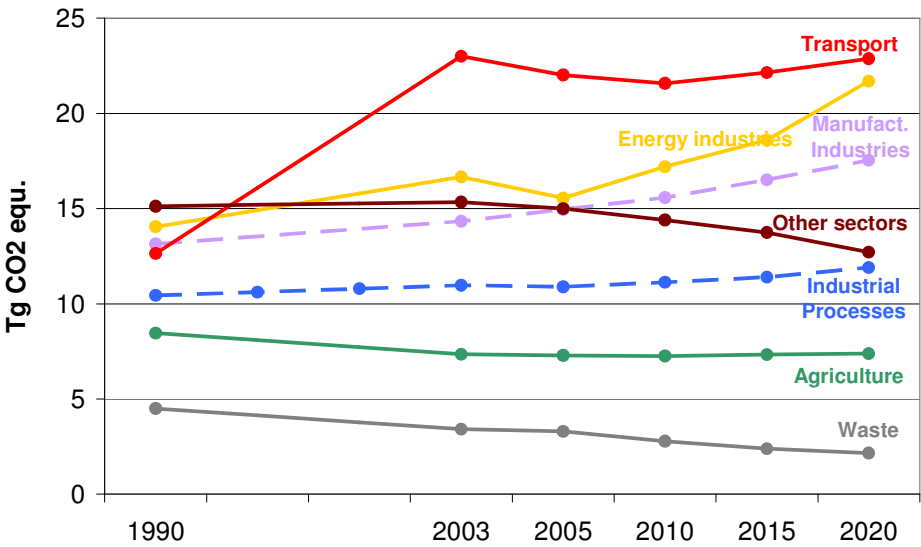


Figure 2.6: GHG emission projections, split into sectors

Chapter 3

Evaluation of the Contribution of Domestic Measures and Use of the Kyoto Mechanisms

It has been shown in the previous chapters that Austria has put a set of policies and measures in place, but that greenhouse gas emission still show rising trends in some sectors. The following sections will list the effect of implemented measures and indicate which further action is planned to reach the Kyoto Target.

3.1 General Approach to Reach the Kyoto Target

Austria ratified the Kyoto Protocol as one of the 15 Member States of the European Union, who have agreed to fulfil their commitments under the Kyoto Protocol jointly according to Art. 4 of the Protocol. Austria has committed itself to a 13% reduction target within the EU burden sharing agreement.

Austria is committed to reach a considerable share of its greenhouse gas emission reductions obligation by domestic policies and measures. Domestic measures are important for a lasting long-term reduction of emissions. Emission reduction strategies and plans have been developed at different levels of administration. The Federal Government has approved a national strategy with a set of domestic measures for the relevant sectors in 2002, several *Länder* have established and implemented regional strategies and the nine *Länder* and more than 600 municipalities have joined the *Climate Alliance* and have set activities to reduce carbon dioxide emissions within their domain. Many and diverse activities have been set to raise public awareness on climate change issues in general and on energy saving and greenhouse gas mitigation measures relevant to the public.

The flexible instruments of the Kyoto Protocol, especially JI and CDM, are seen as additional possibilities to contribute to a mitigation of global greenhouse gas emissions with positive side aspects like an accelerated transfer of environmentally friendly technologies to developing countries and between Annex I countries. Austria will make use of these additional instruments. They will allow compensating for recent developments such as the extraordinary increase of fuel tourism, which has made CO₂ emissions from transport grow much more than expected.

3.2 Effects of Implemented Policies and Measures

Policies and measures already implemented are expected to provide a significant contribution for achieving the Kyoto Target. It has to be mentioned, however, that the highly fragmented responsibilities for climate change mitigation among the Federation, Regions and Municipalities still cause some difficulties for coherent monitoring and evaluation of the effects of policies and measures. That is due to a lack of complete and comparable information on policies and measures and also due to the fact that some measures were undertaken, primarily for other environmental, social or economic needs and that GHG mitigation had been a positive, but rarely measured and evaluated, side effect.

The first comprehensive evaluation of measures is shown in the first assessment report on the implementation of the National Climate Strategy I and was undertaken by the Umweltbundesamt and the Austrian Energy Agency (Benke et al., 2006). It is

a bottom-up analysis of measures of the National Climate Strategy implemented between 2000 and 2003. As listed in Chapter 1, considerable efforts for the reduction of greenhouse gas emissions were undertaken before 2000 too; the effects of these measures, however, could not or could only partly be calculated in the assessment report. Therefore, the effects shown below for the different sectors may be underestimations. A greenhouse gas emission scenario “without measures” with 1990 as the reference year would be adequate to describe the total effect of the mitigation efforts including measures implemented in the 1990ies, but such a scenario is not available for Austria at present. The assessment report also shows the driving forces of the emission trend 1990–2003, which have been analysed by means of a decomposition analysis. These results suggest that factors, which lead to a decrease of emissions, already have a significant effect on emissions; other factors, which lead to an increase of emissions, though have compensated or outweighed the reduction in some sectors.

The assessment of the implementation of the National Climate Strategy and the results of the decomposition analysis are shown below for the individual sectors:

- The effect of measures of the National Climate Strategy implemented from 2000 to 2003 in *energy industries* is expected to be an emission reduction of 2.4 Tg CO₂-equ in 2010, which corresponds to almost 17 % of the emissions in 1990. Factors like the reduced fuel intensity in public power and heat plants, increased use of biomass in district heating plants and reduced carbon intensity of fossil fuels have brought about an emission reduction in the order of 4 Tg from 1990 to 2003 compared to an increasing trend (see also Section 2.1); these factors can be partly attributed to policies and measures implemented in that sector.
- The effect of implemented measures of the National Climate Strategy regarding *space heating* is expected to be an emission reduction of 1.2 Tg CO₂-equ in 2010, which corresponds to about 10 % of the emissions from space heating in 1990. Factors like the improved carbon intensity of fossil fuels (mainly a switch from coal to gas), improved boiler efficiency, increased share of district heating and a lower energy demand per square metre living-space have led to an emission reduction in the order of 2 Tg from 1990 to 2003, which has compensated the influence of the rising number and average size of dwellings. These factors can at least be partly attributed to policies and measures implemented in that sector.
- Emissions from *waste management* have continuously decreased since 1990 due to improved landfill gas recovery, rising quota of separate collection and treatment of waste and the ban on the landfilling of biodegradable waste. The effect of implemented measures of the National Climate Strategy is expected to be an emission reduction of 0.4 Tg CO₂-equ in 2010. An emission reduction of almost 40 % from 1990 to 2010 is expected for the sector.
- The effect of implemented measures of the National Climate Strategy in the *transport* sector is expected to be an emission reduction of 1.4 Tg CO₂-equ in 2010, which corresponds to more than 10 % of the emissions from this sector in 1990. The enormous increase in fuel tourism, however, has completely frustrated all efforts to reduce transport emissions. The improved fuel efficiency observed (decrease in fuel consumption per kilometre) corresponds to an emission reduction in the order of 1 Tg from 1990 to 2003; that reduction, however, could not even completely compensate the emission increase caused by rising domestic transport demand.

- The effect of implemented measures of the National Climate Strategy in *manufacturing industries* and *industrial processes* is expected to be an emission reduction of 1.6 Tg CO₂-equ in 2010, which is about 7 % of the emissions from that sector in 1990. Factors like the reduced carbon intensity of the fossil fuels used and by increased use of renewable fuels have led to an emission reduction in the order of 2 Tg from 1990 to 2003, compared to the increasing trend. These factors can at least be partly attributed to policies and measures implemented in that sector.
- Emissions from *agriculture* have continuously decreased since 1995. The effect of implemented measures of the National Climate Strategy is expected to be an emission reduction of 0.3 Tg CO₂-equ in 2010. An emission reduction of 14 % from 1990 to 2010 is expected for the sector.
- The effect of implemented measures of the National Climate Strategy concerning *fluorinated gases* is expected to be an emission reduction of 0.7 Tg CO₂-equ in 2010, which corresponds to about 40 % of the base year emissions.

Based on bottom-up evaluation from the first assessment report on the implementation of the National Climate Strategy, the aggregate effect of policies and measures *implemented* between 2000 and 2003 is estimated as 7.9 Tg CO₂ equivalent for 2010 in total, which corresponds to 10 % of the greenhouse gas emissions in the base year. The largest share is attributed to the mitigation of CO₂, for which a reduction of 6.1 Tg is expected. It must be pointed out that these figures do not cover the effect of some of the measures listed in Chapter 1 that have been implemented before 2000 and that the effect of all measures implemented since 1990 is likely to be higher.

Decomposition analysis shows that factors that decrease emissions have brought about an emission reduction in the order of 10 Tg CO₂ equivalent from 1990 to 2003. That reduction may partly be attributed to policies and measures implemented since 1990. However, factors leading to an increase of emissions and especially fuel tourism dominate the emission trend.

3.3 Planned Policies and Measures

The expected effect of implemented and adopted measures will not be sufficient to achieve Austria's Kyoto Target of a 13 % emission reduction. According to the "With Measures" scenario, greenhouse gases emissions of 89.9 Tg CO₂ equivalent are expected for the year 2010. Austria will therefore not be able to meet the target with implemented and adopted measures only.

An amendment of the National Climate Strategy is currently negotiated. The draft amendment contains several planned measures that are expected to bring about a significant additional emission reduction by 2010. Planned measures include inter alia:

- for the *energy supply* sector the further development of targets for renewable energy sources and an energy efficiency programme (which will also be of relevance for the *manufacturing industry*), and enhancement of support for biomass district heating systems;

- for the *energy supply* sector and the *manufacturing industry* the National Allocation Plan for the second trading phase under the European Emissions Trading Scheme (EU ETS), which is currently under preparation;
- regarding *space heating* a further tightening of energy relevant standards in building code and housing support schemes as well as an enhancement of Third Party Financing programmes for energy-saving investments in public buildings;
- for the *transport sector* a further internalisation of external costs from road transport and measures to further increase the share of biofuels;
- for agriculture an intensification of measures to reduce methane emissions, to promote organic farming and to support production and use of biogas.

The effect of *planned* policies and measures has been estimated in the draft Climate Strategy II for the year 2010 as 14.4 Tg CO₂ equivalent for all greenhouse gases, where 2.2 Tg are allocated to energy supply, 3.6 to space heating, 4.8 to transport, 0.5 to industry, 0.5 to agriculture and other sectors and the rest to the EU emissions trading scheme.

The total effect of planned policies and measures can also be derived from a “With Additional Measures” scenario, which has been calculated alongside the “With Measures” scenario (Anderl et al., 2006). It must be noted that the model calculations were done during 2005 and could not exactly take into account the policies and measures described in the draft Climate Strategy II. However, they can give an indication of the possible effect of measures under discussion. The results of the scenario and the modelled effect, calculated as the difference between these two scenarios, are shown in Table 3.1. The calculations show a lower effect for the year 2010 (by more than 4 Tg) compared to the draft strategy. The main reason is that the model calculation did not take into account the contribution of the EU ETS during the trading period 2008-2012, by which the cap for trading sectors will be substantially reduced. Further differences do exist with regard to CH₄ and N₂O emissions, where the draft Climate Strategy II detects a considerably higher additional reduction potential than model calculations have shown.

Table 3.1: “With Additional Measures” scenario and aggregate effect of planned policies and measures according to model calculations (in Tg CO₂ equivalent)

	With Additional Measures				Effect of planned PaMs			
	2005	2010	2015	2020	2005	2010	2015	2020
CO ₂	74.23	67.74	71.39	74.67	0.80	8.89	7.91	8.89
CH ₄	7.74	7.16	6.78	6.58	0.00	0.03	0.03	0.03
N ₂ O	4.77	4.60	4.59	4.59	0.00	0.04	0.03	0.03
HFCs, PFCs, SF ₆	1.47	1.47	1.37	1.47	0.00	0.00	0.00	0.00
Total	88.21	80.97	84.13	87.31	0.80	8.96	7.97	8.95

Both the *planned* policies and measures of the draft strategy and the “With Additional Measures” scenario of the model calculations indicate that the actual approach is appropriate to show demonstrable progress in greenhouse gas mitigation by 2005 and to follow Austria’s Kyoto target under the EU burden sharing agreement. The remaining gap of 8-9 Tg CO₂ equivalent between expected emissions during the commitment period 2008-2010 and the assigned amount of 68.7 Tg CO₂ equivalent will be bridged by utilising the project-based flexible mechanisms of the Kyoto Protocol.

3.4 Use of the Kyoto Mechanisms

The Austrian JI/CDM Programme aims to contribute to achieving the Austrian reduction commitment under the Kyoto Protocol through the application of the project-related flexible mechanisms, Joint Implementation and Clean Development Mechanism. The programme foresees the purchase of emission reduction credits from JI or CDM projects, which lead to avoidance or reduction of greenhouse gas emissions, as well as the financing of particular immaterial services, such as baseline studies etc., which are necessary with respect to JI or CDM projects. Based on the amendment of the Environmental Support Act the Programme was launched in August 2003. Kommunalkredit Public Consulting (KPC) was appointed for the Programme Management.

Several calls for JI and CDM projects have been published since the launch of the programme and a relevant number of projects are already contracted, corresponding to emissions reductions in the order of 7.5 Tg CO₂-equivalent during the commitment period 2008-2012. In total, the government is planning to purchase ERUs and CERs corresponding to 35 Tg CO₂-equivalent (7 Tg annually 2008-2012). A purchase budget of 36 million € annually from 2006 to 2012 is guaranteed by law (after 1 million € in 2003, 12 million € in 2004 and 24 million € in 2005). The total budget available for purchase of emissions reductions therefore will amount to 289 million €. Recent information can be found at <http://www.klimaschutzprojekte.at>.

Chapter 4

Other Commitments

Apart from the reduction of greenhouse gas emissions, Parties to the Kyoto Protocol have taken on other commitments. The following sections describe how Austria is meeting its commitments under Article 10 and 11 of the Protocol.

4.1 National System for Greenhouse Gas Inventory

The *Umweltbundesamt* is identified as the single national entity with overall responsibility for the national greenhouse gas emissions inventory by law. The responsibilities for the inventory planning, preparation and management are specified and are all allocated within the *Umweltbundesamt*.

The national greenhouse gas inventory is prepared by the inspection body for GHG inventories within the *Umweltbundesamt* which will soon be accredited as inspection body according to the International Standard ISO 17020 *General Criteria for the operation of various types of bodies performing inspections*. The accreditation audit of the *Umweltbundesamt* as inspection body took place in September 2005. Official conclusion of the accreditation took place in early 2006. The Quality Management System (QMS) also includes the necessary procedures to ensure quality improvement of the emission inventory. These comprise documentation and attribution of responsibilities of any discrepancy found and of the findings by UNFCCC review experts in particular.

The inventory preparation, including identification of key categories, uncertainty estimates and QC procedures, is performed according to the 2000 Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management of Greenhouse Gas Inventories. An update of uncertainty estimates is planned for 2006. The inventory management as part of the QMS includes a control system for data and calculations, for records and their archiving as well as documentation on QA/QC activities. This ensures the necessary documentation and archiving for future reconstruction of the inventory and for the timely response to requests during the review process.

Part of the legal and institutional arrangements in place as basis for the national system concerns the data availability for the annual compilation of the GHG inventory. The main data source for the Austrian inventory preparation is the Austrian statistical office (*Statistics Austria*). The compilation of several statistics is regulated by law; the compilation of the national energy balance is regulated by contracts only. Other data sources include reporting obligations under national and European regulations and reports of companies and associations.

4.2 National Programmes to Mitigate Climate Change

Austria has developed a programme to reduce emission of greenhouse gases, covering all relevant sectors (energy, transport, industry, agriculture and forestry, waste management). The Climate Strategy 2010 was adopted by the federal government and the council of provincial governors in 2002. Policies and measures of the strategy are described in more detail in Chapter 1 of this report.

4.3 Adaptation Measures

The Austrian federal government till now puts priority on the mitigation of greenhouse gas emissions. It should be pointed out, however, that Austria as an alpine country is used to adapt to environmental risks since centuries. The permanent implementation of new adaptation measures motivated by socio-economic and land use changes is beneficial for adapting to a climatic change.

Austrian adaptation measures can be distinguished into measures directly motivated by impacts of observed climate change and existing measures related to environmental risks, which can be or are going to be further optimised with respect to adaptation to climate change. Till now the direct climate change motivated adaptation measures are mainly initiated by private companies or local administrations. The extreme events during the last years, however, highlighted the demand for a broader and coordinated treatment of all potential adaptation measures. Within the ongoing international EC-founded research project AMICA “Adaptation and Mitigation – an Integrated Climate Policy Approach”, an approach to combine long-term climate protection and short- and midterm adaptation measures at the local level shall be developed. A national adaptation plan as such does not yet exist.

Climate change induced adaptation measures can be found in different sectors. With respect to *water resources and agriculture*, for example, the “Marchfeld Kanal” (a channel system to provide irrigation water in an important area for crop production) or insurance instruments against yield losses due to water stress may be mentioned. The vulnerability of Austrian *forests* regarding climate has been shown in first research projects; the National Forest Programme (established in 2005) foresees the development of a detailed research strategy concerning adaptation and of an information and training concept to disseminate recommendations on this matter. Winter tourism is an important economic sector in several Austrian regions, but it is very sensitive to climatic change due to its dependence on snow cover. To reduce that vulnerability, high investments in mainly technical adaptation measures like artificial snow making facilities are made by this sector.

An increasing number of extreme weather events may be the consequence of a warming climate and protection against natural disasters is of importance as an adaptation measure. Preventive measures for protection against natural disasters like torrents, floods and avalanches have a long tradition and a high status in Austria and are perceived as state tasks. They extend from land-use planning to silvicultural and technical precaution measures and they are based on the documentation of damages and the investigation of their causes. Considerable amounts of the budget are spent in this area.

4.4 Transfer of Technology

The energy technology and R&D collaboration programme of the International Energy Agency is important instrument for the transfer of energy related technology. Austria is a member of the IEA and has joined several of the so-called joint

Implementation Agreements which are relevant for greenhouse gas mitigation. Austria participates in work on renewable energy sources (solar heating and cooling, bioenergy, wind energy, heat pumps), energy saving and new vehicle concepts. Non-member countries, especially developing countries in Africa and Asia, take advantage of the work of IEA's Office of Non-Member Countries, which was established to better understand the energy situation of non-member countries and regions, and to develop policy dialogue, cooperation and collaborative projects with these countries.

Austria is member of the Climate Technology Initiative (CTI), which was established in 1995 at the Conference of Parties to the UNFCCC and has a new status as an IEA Implementing Agreement since 2003. Its mission is to promote the objectives of the UNFCCC by fostering international cooperation for accelerated development and diffusion of climate friendly technologies and practises for all activities and greenhouse gases. The main principles of CTI are close collaboration with developing countries and economies in transition and partnership with stakeholders, including the private sector, non-government organisations (NGOs), and other international organisations. CTI performs inter alia capacity building and technical assistance for technology needs assessments as well as technology implementation activities and organizes seminars, symposia and training courses.

Many projects funded by ODA, by NGOs and industry facilitate the transfer of environmentally sound technologies and know-how to developing countries. Use of environmentally sound technology is an important principle for Austrian ODA projects. Several projects in developing countries, funded by the Austrian ODA, are related inter alia to small hydro power, solar thermal energy and photovoltaics, geothermal energy and biogas.

4.5 Co-operation on Research and Systematic Observation

Research co-operation is carried out within Research Framework Programmes of the European Union. Within the 6th Research Framework Programme Austria has joined several so-called "European Research Area Networks" (ERA-Net) related to climate change issues (the ERA-Nets "Bioenergy", "Erabuild", "Hydroenergy" and "Photovoltaic" need to be mentioned). Austrian researchers have participated and participate in a number of joint research projects on climate system studies, climate change impacts, and mitigation and adaptation technologies; details can be found in the National Communications of Austria.

A dense network of observing stations for meteorological and hydrological parameters has been brought about by the rather heterogeneous meteorological patterns in the alpine region. Austria's instrumental time series are amongst the longest in Europe and go back as far as the 18th century. The high altitude meteorological observatory at Hoher Sonnblick (at 3106 metres above sea level) has been operating continuously since 1886, which is the longest continuous and homogeneous meteorological time series for high altitudes worldwide. Austrian data are exchanged within international networks such as the World Weather Watch, the GCOS surface network, the Global Atmosphere Watch, CLIMAT and the Global

Terrestrial Network – Glaciers. During the recent years Austria has increasingly engaged in space-based observation programmes.

4.6 Public Awareness on Climate Change Issues

Environmental education in schools is an inter-disciplinary instruction principle and issues related to climate protection, such as energy saving and renewable energy, have received increased attention during the recent decades. For more than 20 years, the Forum Environmental Education has been developing and promoting educational programmes, supported by both the Ministry of Education and the Ministry of Environment. Awareness of climate issues in schools is strengthened by various initiatives at Federal and *Länder* level, e. g. by competitions and workshops. Austria also plays an active role in the government based network "Environment and School Initiatives/ENSI", which is devoted to innovation and research in environmental education and education for sustainable development. ENSI brings together school initiatives, school authorities, teacher training, educational research institutions and other stakeholders from more than twenty countries worldwide and has developed an official partnership with UNESCO and UNECE.

Training programmes and seminars have been established by public institutions and regional energy agencies for different target groups. Reliable and independent advisory services on energy issues, which are offered free of charge to private households by energy agencies and several non-profit environmental consulting organisations and partly by the *Länder* authorities themselves, have received enormous interest from the population throughout recent years. Related programmes directed especially at small and medium enterprises exist in many *Länder*. The Federal Ministry of Agriculture and Forestry, Environment and Water Management launched the eight-year initiative "klima:aktiv" with a series of target-group oriented programmes in the areas construction and energy efficiency, transport and mobility, communities and renewable energy sources. Training and advisory services dealing with sustainable farming and forestry are offered by the regional Chambers of Agriculture to their members.

There is substantial public awareness on climate change issues in Austria. Campaigns and initiatives are organised and funded by the Federal Ministry of Agriculture and Forestry, Environment and Water Management and by the *Länder*; they usually focus on concrete recommendations and incentives for measures to protect the climate system, for example in the areas energy, transport and agriculture. Particular mention must be made of the Climate Alliance, which is a partnership between more than 1000 European local authorities and indigenous rainforest peoples with the goal of protecting the earth's atmosphere. In Austria more than 600 municipalities and all *Länder* have joined the Climate Alliance.

4.7 Assistance to Developing Countries

The Global Environmental Facility (GEF) was set up in 1991 in order to help developing countries and, to some extent, countries with economies in transition,

cope with four major environmental problems of basic and world-wide importance, among them the issue of global warming. Austria has provided contributions to the GEF since 1991; the Austrian participation in the GEF has been financed in addition to existing commitments and payments to other international financial institutions. From 2001 to 2004, Austria provided about EUR 25 million.

With respect to bilateral financial assistance, it must be mentioned that projects of the Austrian official development assistance (ODA) have to comply with the target of environmental sustainability; a considerable share of projects has environment protection as main or significant additional target. Programme and project aid of the Federal Ministry for Foreign Affairs amounted to EUR 414 million from 2001 to 2004, which was about 18 % of total Austrian ODA. Several priority regions in Africa, the Himalayas and Central America with a large share of least developed countries are supported in long-term partnerships. Further project-based support was granted by other ministries, *Länder*, municipalities and Austrian NGOs. More than EUR 500 million were contributed to the EU development assistance funds by Austria during this period.

Bilateral efforts on projects of special relevance for climate change mitigation have been concentrated on technical assistance for sustainable use and management of natural resources and on transfer of technology and know-how in the areas of renewable energy sources, energy efficiency and cleaner production. Austria has also contributed to multilateral institutions like the International Development Association, the African and the Asian Development Fund and the International Fund for Agricultural Development. These contributions cannot be attributed specifically to the implementation of the Convention, as such attribution has to be done at the level of each of the institutions in accordance with the activities they have financed.

Appendix A: References

- Anderl M., Freudenschuß A., Halper D., Kurzweil A., Poupa S., Wappel D., Wieser M., 2005: *Austria's National Inventory Report 2005 – Submission under the United Nations Framework Convention on Climate Change*. BE-268; Umweltbundesamt, Vienna, Austria.
- Anderl, M., Böhmer S., Domenig M., Köther T., Krutzler T., Kurzweil A., Lichtblau G., Meister F., Michelberger F., Muik B., Neubauer Ch., Perz K., Pölz W., Poupa S., Ritter M., Riegler E., Schachermayer E., Schwaiger E., Storch A., Wappel D., Wiesenberger H., Wieser M., Zethner G., 2006: *Austria's Projection of Greenhouse Gases 2003-2020*. Umweltbundesamt, Vienna, Austria.
- Benke G., Bogner T., Böhmer S., Domenig M., Gugele B., Hatzenbichler B., Hüttler W., Krutzler T., Kurzweil A., Lang G., Leutgöb K., Lichtblau G., Lutter E., Muik B., Neubauer Ch., Pölz W., Raimund W., Ritter M., Rigler E., Sattler M., Schachermayer E., Schäppi B., Schindler I., Storch A., Schwaiger E., Veigl A., Wiesenberger H., Wieser M., Zethner G., 2006: *Evaluierungsbericht zur Klimastrategie 2002*. Report 0021, Umweltbundesamt, Vienna, Austria.
- BMLFUW, 2001: *Strategie Österreichs zur Erreichung des Kyoto-Ziels (Klimastrategie 2000–2008/2012) – Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management*, Vienna, Austria.
- Dunkel G., Gruber K., Hammer M., Kettner C., Kletzan D., Köppl A., Sanz B., Schabauer D., Schleicher S., Stockmayer M. and Thenius G., 2006: *Fundierung der Entscheidungsgrundlagen für den Zweiten Allokationsplan (NAP-2) im EU-ETS*. KWI Management Consultants und Österreichisches Institut für Wirtschaftsforschung, St. Pölten and Vienna, Austria.
- Kratena K., and Wueger M., 2005: *Energieszenarien für Österreich bis 2020*. Austrian Institute of Economic Research, Vienna, Austria.

Appendix B: EU Common and Co-ordinated Policies and Measures

The following list shows common and co-ordinated policies and measures at EU level and how they have been implemented in Austria.

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC:

Bundesgesetz über ein System für den Handel mit Treibhausgasemissionszertifikaten (Emissionszertifikatengesetz – EZG), BGBl. I Nr. 46/2004, and related ordinances of the Federal Minister of Agriculture, Forestry, Environment and Water Management

Council directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity

Bundesgesetz, mit dem das Energieabgabenvergütungsgesetz geändert wird, BGBl. I Nr. 92/2004,
Bundesgesetz, mit dem das Kohleabgabengesetz geändert wird, BGBl. I Nr. 91/2004

Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market

Bundesgesetz, mit dem Neuregelungen auf dem Gebiet der Elektrizitätserzeugung aus erneuerbaren Energieträgern und auf dem Gebiet der Kraft-Wärme-Kopplung erlassen werden (Ökostromgesetz), BGBl. I Nr. 149/2002

Directive 2004/8/EC on the promotion of cogeneration:

Bundesgesetz, mit dem das Elektrizitätswirtschafts- und –organisationsgesetz, das Gaswirtschaftsgesetz, das Energielenkungsgesetz 1982, das Erdöl-Bevorratungs- und Meldegesetz 1982, das Energie-Regulierungsbehördengesetz, das Bundesgesetz gegen den unlauteren Wettbewerb 1984 und das Wettbewerbsgesetz geändert werden (Energie-Versorgungssicherheitsgesetz 2006), BGBl. I Nr. 106/2006

Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme (EMAS):

Bundesgesetz über begleitende Regelungen zur EMAS-Verordnung (Umweltmanagementgesetz - UMG), BGBl. I Nr. 96/2001 i.d.F. BGBl. I Nr. 99/2004

Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings:

Implementation under preparation

Various Directives on the energy labelling of household appliances:

Implemented by ordinances of the Federal Minister of Economics and Labour

Council Directive 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels:

Vereinbarung zwischen dem Bund und den Ländern gemäß Art. 15a B-VG über die Einsparung von Energie, BGBl. Nr. 388/1995

Shifting the balance between modes of transport, in particular towards rail transport 2001/12/EC, 2001/13/EC, 2001/14/EC of 15/03/01 (“First Railway Package”), 2004/49/EC, 2004/50/EC, 2004/51/EC of 29/04/2004 (“Second Railway Package”):

Bundesgesetz vom 30. April 2004 zur Änderung des Eisenbahngesetzes, BGBl. I Nr. 38/2004 for the “First Railway Package”, “Second Railway Package” (partly) implemented by various acts and ordinances

Directive 2003/30/EC of the European Parliament and the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport:

Änderung der Kraftstoffverordnung, BGBl II Nr.417/2004

Commission Recommendations of 5 February 1999 and 13 April 2000 on the reduction of CO2 emissions from passenger cars (voluntary agreement of the car manufacturers from EU, Japan and Korea to reduce fleet average CO2 emissions to 140 g/km by 2008/09):

Monitoring performed by the Austrian Statistical Office

Directive 1999/94/EC of the European Parliament and the Council of 13 December 1999 relating to the availability of consumer information on fuel economy and CO2 emissions in respect of the marketing of new passenger cars:

Bundesgesetz über die Bereitstellung von Verbraucherinformationen beim Marketing für neue Personenkraftwagen (Personenkraftwagen-Verbraucherinformationsgesetz – Pkw-VIG), BGBl. I Nr. 26/2001 i.d.F. BGBl. I Nr. 34/2006

Council directive 1999/31/EC of 26 April 1999 on the landfill of waste:

Verordnung des Bundesministers für Umwelt über die Ablagerung von Abfällen (Deponieverordnung), BGBl. Nr 164/1996, i.d.F. BGBl. II Nr. 49/2004