2005 Climate Policy Progress Report of the Netherlands

Submitted to the European Commission pursuant to Decision No 280/2004/EC, Article 3(2), by the Ministry of Housing, Spatial Planning and Environment of the Netherlands, in March 2005 and updated in May 2005 pursuant to Decision No 280/2004/EC, Article 5(3).

Introduction to the May update

This is an updated version of the Climate Policy Progress Report submitted to the European Commission in March 2005. It is based on Article 5(3) of Decision No. 280/2004/EC, which allows Member States to submit updated information on emission projections no later than 15 June 2005. The report has been updated in order to reflect data in the National Inventory Report 2005 (not yet available when the original version of the report was being finalized in March) as a well as a a revised version of the report *Reference Projections Energy and Emissions 2005-202*0 [*Dril et. al., 2005*] issued by the national research institutes ECN and MNP/RIVM in May 2005.

The institutes revised their report in order to change their conclusions about the possible import or export of CO_2 emissions allowances during the second trading period of the European CO_2 emissions trading scheme. Their reasons for doing so are set out in the introduction to the revised verion of [*Dril et.al., 2005*]. In the earlier version of their report the institutes concluded that Dutch companies would be net buyers of allowances if the ceiling were to remain at its current (2005-2007) level. In the revised version, they conclude that Dutch companies may have room to be net sellers of allowances if the ceiling remains where it currently is. The projected domestic energy balances and emissions remain however unaltered in the revised version.

The changes relative to the March 2005 submission include the following.

- Annex 6 has been revised to reflect historic emission data from the National Inventory Report 2005.
- Figures 2-2, 2-3, 2-4, 2-5 and 2-6 have been adjusted to reflect the most recent inventory data for the years 1990 through 2003.
- A reference in section 1.9 to an analysis of the impact of the CO_2 emissions trading scheme has been eliminated to reflect the conclusions of the revised reference projections [*Dril et.al., 2005*].

In addition, it is important to note new insights which are relevant when drawing policy conclusions based on the results of the reference projections. These new insights have been noted in the introduction to the revised version of [*Dril et.al., 2005*].

First, the projections were based on preliminary emission figures for the year 2002, which for a number of sources (CO_2 from refineries and CH_4 from the category 'other') were lower than the final figures reported in the National Inventory Report 2005. And second, [*Dril et.al., 2005*] reports projections of transport sector emissions dating from 2003, which do not include emissions from fisheries or defense activities. (Emissions from these sectors have only been calculated separately and included in the national totals since 2005.) Assuming that the emissions from these sources remain constant until 2010 and 2020, the projections for 2010 and 2020 reported in this submission may also be underestimated by about 3 Mtonnes.

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0. Introduction

This is the first report to be submitted by the Netherlands under Decision No. 280/2004/EC. The last report under the old monitoring mechanism (Decision 93/389/EEC as last amended by Regulation (EC) No 1882/2003) was submitted in March 2004 under the name *Note Regarding Developments in Dutch Climate Change Policy [MHSPE, 2004]* .

The 2005 report provides an overview of the Netherlands' policies and their effects since 1990. 1990 was chosen as the starting point in order to enable the European Commission to paint a complete picture of the Netherlands' efforts in the European Union's report on demonstrable progress to be submitted to the UNFCCC in January 2006.

The structure and content of the report follow not only the Implementing Provisions adopted under 280/2004/EC (Commission Decision 2005/166/EC) but also the UNFCCC reporting guidelines (FCCC/CP/1999/7). Many sections of the report will therefore be used in the Netherlands' own demonstrable progress report and its 4th National Communication to the UNFCCC, enabling the Netherlands to fulfill its international reporting obligations as efficiently as possible.

In accordance with Decision 280/2004/EC, article 3.2, this report contains the following four chapters:

1. Policies and measures
2. Projections of future emissions
3. Implementation of relevant Community legislation and policies; legal and institutional steps to prepare to implement commitments under the Kyoto Protocol and arrangement for and national implementation of compliance and enforcement procedures
4. Institutional and financial arrangements and decision making procedures to coordinate and support activities related to participation in the mechanisms under art. 6, 12 and 17 of the Kyoto Protocol, including the participation of legal entities.

For ease of presentation, nine appendices present in tabular format some of the information required by Decision 280/2004/EC and the Implementing Provisions. The appendices deal with the following topics:
Annex 1: Summary Table Policies and measures in the Netherlands
Annex 2: Policies which have expired or been repealed since previous report to the European Commission
Annex 3: Mandatory parameters on projections pursuant to Annex IV, Implementing Provisions
Annex 4: IPCC source categories related to sectoral definitions
Annex 5: Policies and measures in the three policy variants
Annex 6: Emissions projections by scenario, policy variant and year
Annex 7: Mandatory indicators for projections pursuant to Annex III, Implementing Provisions
Annex 8: Emissions projections for international bunkers
Annex 9: Implementation of Common and Coordinated Policies and Measures in the Netherlands

The submission closes with a list of references.

1. Policies and measures

This chapter describes policies and measures implemented since 1990 which have had, or are expected to have, a large impact on greenhouse gas emissions in the Netherlands, even if the primary objective of the policy is (or was) not directly related to climate change. The scope of the chapter is limited to domestic and EU policies and measures implemented in the Netherlands. Chapter 4 is devoted to institutional and financial arrangements regarding use of the Kyoto mechanisms Joint Implementation and the Clean Development Mechanism by the Dutch government.

The chapter is organized by sector using the sectoral definitions requested by the UNFCCC guidelines (Energy, Transport, Industry, Agriculture, Forestry, and Waste). It also includes paragraphs on policies in the the buildings sector (households and services sector) and on cross-sectoral policies. Annex 4 presents an overview of how IPCC source categories can be transposed into the sectoral definitions used in this report.

Each section describes groups of policies and measures organized by greenhouse gas; only the most important ones are described in detail. The paragraphs need to be read in conjunction with Annex 1, which provides the following information required by Decision 280/2004/EC by sector in tabular form:

- greenhouse gas affected
- name of policy
- objective or activity affected
- type of policy
- status
- implementing entity
- quantitative estimate of emission reduction impacts after 2000
- linkage with CCPM's

Each section closes with a summary table showing the effects realized in the sectors in terms of avoided emissions in the year 2000 as well as projected effects in the years 2005, 2010, 2015 and 2020. The projected effects have been estimated against the background of the Global Economy scenario described in chapter 2. The effects are presented for clusters of policies and measures affecting the different sectors rather than for individual measures. In analyses performed at a fairly high level of aggregation, it is often neither possible not meaningful to separate out the impacts of individual instruments and programs which aim at the same emission source or activity. In order to gain insights into the relative merits of different policies at a less highly aggregated level, each year one sector is chosen for an in-depth ex post evaluation of (cost) effectiveness. The government has completed two such in-depth evaluations, for the sectors transport and buildings. The results are presented in section 1.4 and section 1.8 respectively.

The descriptions of policies in the main text include the actual and expected interaction with other relevant policies and measures and with Common and Coordinated Policies and Measures of the European Union (CCPM's). Impacts other than emission reductions (including economic impacts to the extent feasible, costs, non-greenhouse gas mitigation benefits and interactions with other policies and measures) are described in the text where possible, but are not presented in the Summary Table. The cost calculation methods used in the Netherlands are described in the box on page 4.

Annex 2 provides a summary of policies which have been repealed or have expired since the Netherlands' last report to the European Commission in March of 2004.

In keeping with Article 3 (2) section a, subsection vi of Decision 280/2004/EC, the chapter closes with paragraph 1.9 on the supplementarity of the Netherlands' climate change policies. The word 'supplementarity' refers to the extent to which domestic action constitutes a significant element of the efforts undertaken at national level and use of the Kyoto mechanisms is supplemental to domestic action. Paragraph 1.9 also serves to fulfill the requirement imposed on Member States by Article 1.8 of Directive 2004/101/EC (also known as the Linking Directive).

The indicators required by Article 3 (2) section a, subsection iv of Decision 280/2004/EC are presented in Annex 7 rather than in this chapter since they are tied to the results of the projections reported in chapter 2.

Methods for calculating costs

The Financial Costs Method expresses costs as they are perceived by market parties such as households and businesses. This method works with the different energy prices paid by final users of energy in the various sectors, including distribution margins, taxes, excise duties and VAT (where relevant). Annual capital costs are calculated with the (estimated) interest rates that are paid on average by the various sectors of the economy. Cost-effectiveness may be presented either including or excluding the effect of tax schemes and other government policies which affect capital outlays differently in individual sectors.

The National Costs Method, on the other hand, presents the costs and benefits of measures for the Netherlands as a whole. This method is used to provide a consistent basis for comparing the cost-effectiveness of measures regardless of who took or paid for them. Costs for one sector are often benefits for another. While this information is certainly relevant for the sectors involved, the costs and benefits cancel each other out at the national level. The method uses national shadow prices for energy and a social discount rate is used in calculating capital costs.

Government costs are simply the outlays made by the government in connection with the policy in question (subsidy budgets or foregone tax revenues, administrative and enforcement costs, and costs incurred for monitoring, reporting and outreach programs). Government expenditures are translated into annuities in order to enable comparisons between one-time outlays and recurring yearly benefits. The annuities are calculated for a period of 10 years using a social discount rate of 4 percent.

1.1 Cross Sectoral Policies

Some policies apply to more than one sector. Existing instruments that are cross sectoral include: *Energy Investment Tax Deduction (EIA), CO_2 Reduction Program/General, Reduction Program Non-CO_2 Gases, Energy Tax, Environmentally Friendly Electricity Production Program (MEP), Long-Term Agreements, Benchmark Covenant, CO_2 Emissions Trading* and *Climate Covenant* with provinces and municipalities. The sectors affected by these policies are shown in the Table 1-1. The policies are described in the sections where their impacts are greatest (indicated in Table 1-1), except for the CO_2 Reduction Program, the Reduction Program Non-CO_2 Gases, and CO_2 Emissions Trading which are described in this section.

Table 1-1: Cross sectoral policies and where to find descriptions of them

instrument	*sector affected*						*described in section*
	house-holds	*services*	*agriculture*	*industry*	*energy*	*transport*	
Energy tax	X	x	x	X			1.8
Climate Covenant	X	x	x	X	x		1.8
ElAl		x	x	x	x	X	1.3
Long-Term Agreements Energy Efficiency		x	x	x			1.3
Benchmark Covenant				x	x		1.3
CO_2 Reduction Program/General			x	x	x		1.1
Reduction Program Non-CO_2 Gases			x	x	x	x	1.1
MEP			x	x	x		1.2
CO_2 Emissions Trading				x	x		1.1

The summary table in Annex 1 present the emissions reduction effects of these cross sectoral instruments in the sectors where the effects occur.

CO_2 Reduction Program/General (status = implemented)
The CO_2 Reduction Program provides support to large scale investment projects which contribute substantially to reducing national emissions of CO_2. The aim of the program is to encourage investment in projects which are not yet profitable enough for independent market introduction. Cost-effectiveness is the chief criterium for assessing projects, the avoided emission per euro of subsidy must be as large as possible. The program also makes information and experience acquired through the projects supported available to a broader public, such as research institutes and institutions of higher learning. The budget for the program is € 351 million. The goal of the program is to reduce emissions by 4 or 5 Mtonne CO_2-equivalents per year in 2008-2012, due to the investment projects.

Reduction Program Non-CO_2 Gases (status = implemented)
The Reduction Program Non-CO_2 Gases (known by its Dutch acronym ROB) was set up in 1999 and is expected to run until 2012. Its object is to reduce Dutch emissions of the non-CO_2 greenhouse gases to an average level of 33 Mtonne CO_2-equivalents in the period 2008-2012. The ROB program is run by SenterNovem with an approach based on close cooperation between government and the private sector. Its activities, divided among 14 projects, include improving information about emission factors and emission levels, subsidizing research into and development of new emission reduction methods and techniques and encouraging implementation of measures. The government has made a total of about € 200 million available over the period 1999-2012 for subsidies, grants and tax breaks in this area. The ROB subsidy budget in 2004 amounted to €1.5 million.

CO_2 Emissions Trading (Status = implemented)
The Dutch Allocation Plan was finalised in August 2004. The allocation decision was completed in October 2004. Allocations have been made to 206 installations which together emit about 40% of total CO_2 emissions in the Netherlands. Excluded from the allocation decision are 93 installations for which the Commission has agreed to an opt-out. A positive decison on another opt-out request for 47 installations is still to be officially confirmed by the Commission. Forty-eight companies have appealed the decision. A final decision on the appeals is expected from the Dutch State Advisory Council in September 2005. The national registry is nearly ready to go into operation.

Emission permits have been granted to almost all installations concerned, which means that their monitoring protocols have been verified and approved by the Netherlands Emission Authority. Aside from final details to be resolved, Directive 2003/87/EC has been implemented in the Netherlands.

1.2 Energy

CO_2

CO_2 policies relating to the energy sector have traditionally fallen into three general categories: those aimed at encouraging the use of renewable energy (such as the special provisions under articles 36o, 36i, and 36r of the *Energy Tax*, the *Environmentally Friendly Electricity Production Program*, the *Intergovernmental Wind Energy Agreement* known as BLOW and the *Coal Covenant*), those aimed at increasing the penetration of combined heat and power (such as the *special gas price*, the *energy tax exemption* for combined heat and power (CHP) gas and own use of CHP electricity, the *CO_2 Reduction Program)* and those aimed at improving the efficiency of electric power plants (electric power producers and refineries participate in the *Benchmark Covenant* aimed at achieving the world top in energy efficiency, described further in section 1.3). The *Energy Investment Tax Deduction* (EIA) supports measures in all three categories.
As of 1 January 2005, *CO_2 emissions trading* has entered into force in the Netherlands, as prescribed by Directive 2003/87/EC.

A number of the most important policy instruments currently in effect are described below.

Coal Covenant (status = implemented)
The government and the owners of existing coal-fired power plants signed this negotiated agreement in 2002. The companies committed themselves to increasing the amount of biomass used in their plants, with the goal of reaching an average during the period 2008-2012 that corresponds with 503 MW_e of installed biomass-capacity, good for 3.2 Mtonne of CO_2 emission reduction. In 2003 (the last year for which a monitoring report is available) their use of biomass was good for 0.7 Mtonne of CO_2 reduction, corresponding to 121 MW_e of installed biomass capacity. The companies also agreed that both their coal- and gas-fired power plants would participate in the Benchmark Covenant to improve energy efficiency. As part of this agreement, the government changed the fuel tax on fuel inputs to electricity production into a tax on kWh-output as part of the energy tax as of 1 January 2001.

Intergovernmental Wind Energy Agreement (BLOW) (status = implemented)
The Intergovernmental Wind Energy Agreement (known by its Dutch acronym BLOW) was signed in July 2001. It contains agreements between central government, the provinces and the municipalities aimed at realizing 1500 MW of onshore wind power capacity in 2010.

Environmentally Friendly Electricity Production Program (MEP) (status = implemented)
This subsidy program was introduced in July 2003 and replaced special provisions in the energy tax designed to encourage the supply of renewable energy. The MEP program provides subsidies for environmentally friendly electricity generation, specifically that based on renewable energy and combined heat and power. This subsidy is granted for a maximum period of 10 years and the amount of the subsidy depends on both when the investment is made and the type of installation. Table 1-2 presents the current subsidy rates.

Table 1-2: rates of subsidies for environmentally friendly electricity generation (MEP)

subsidy granted in	***type of installation***	***€/kWh 1 Jan 04- 30 June 04***	***€/kWh 1 July 04- 31 Dec 04***	***€/kWh from 1 Jan 05***
2004	< 50 MW capacity, non-contaminated biomass	0.067	0.082	0.097
	< 50 MW capacity, contaminated biomass	0.029	0.029	0.029
	> 50 MW capacity, non-contaminated biomass	0.04	0.055	0.07
	>50 MW capacity, non-contaminated biomass	0.029	0.029	0.029
	landfill gas in power plant	0.0	0.006	0.21
	landfill gas in waste incinerator, efficiency > 26%	0.029	0.029	0.029
	on shore wind power	0.048	0.063	0.078
	off shore wind power	0.067	0.082	0.097
	solar	0.067	0.082	0.097
	wave, tidal power	0.067	0.082	0.097
	hydropower	0.067	0.082	0.097
	combined heat and power, delivered to the grid[1]	0.0057	0.026	0.022

[1]The advantage of the energy tax exemption on own use is accounted for. As of July 2004, only electricity produced CO_2 neutrally is subsidized. This is roughly 19 percent of electricity.

CH_4

Low CH_4 oil and gas production and distribution (status = implemented)

In 1995 the Dutch government negotiated an *environmental covenant* with oil and gas producers with the aim of reducing methane emissions from their activities by 10% in 2000 relative to 1990. This target was exceeded, with reductions of 65% being achieved in 2001. The environmental covenant was reinforced by *long term agreements on energy efficiency* with the companies in the sector. Besides energy savings these agreements also stimulated the implementation of measures which led to reductions in CH_4 emissions, such as less venting of natural gas. As of 2000 all installations within the oil and gas industry were required to install state of the art technology by the Netherlands' Emissions Regulations (NeR).

Summary energy sector

The following box presents a summary of the emission reduction impacts of the policies and measures affecting emissions from the energy sector in the period 1990-2020.

Summary of Emission Reductions in the Energy Sector, in Mtonne CO_2-equivalent avoided emissions per year						
policy cluster	***gas***	***realized***	***projected***			
		2000	***2005***	***2010***	***2015***	***2020***
combined heat and power	CO_2	4.2	1.0	1.9	1.6	1.3
renewable energy	CO_2	1.0	1.5	4.1	9.4	18.8
CO_2 emissions trading	CO_2	--	0.3	1.1	3.6	1.0
low methane oil and gas production and distribution	CH_4	1.5	0.3	0.3	0.3	0.3
total		6.7	3.1	7.1	14.9	21.4

1.3 Industry

CO_2

Policies affecting CO_2 emissions generally are aimed at improving industrial energy efficiency. They include the *Energy Efficiency Benchmarking Covenant*, *Long Term Agreements* (LTA's) with industrial sectors backed up by *environmental permits* based on the Environmental Management Act, and the *Energy Investment Tax Deduction* regime within the corporate income tax (known as the EIA). The *CO_2 Reduction Program/General*, a cross sectoral subsidy scheme described in section 1.1, is also available to firms in the industrial sector.

With the introduction of *CO_2 emissions trading* as of 1 January 2005, the impact of policies aimed at encouraging energy savings is expected to decline as the market price of CO_2 allowances becomes the driving force behind investments in energy efficiency by the companies falling under the trading scheme.

Benchmarking Covenant (status = implemented)

The Benchmarking Covenant between national and provincial governments, and industrial representatives dates from 1999. It is a negotiated agreement in which participating firms (energy intensive companies with annual energy consumption of 0.5 PJ or more) have committed to achieving (and/or holding) a position among the most energy-efficient in their business, in the world, no later than 2012. International standards of comparision (benchmarks) are developed for each industrial process covered by the agreement. An independent Verfification Bureau Benchmarking facilitates and monitors the process. The benchmarks (and long term agreements, see following paragraph) are also used in allocating emission allowances under the CO_2 Emissions Trading Scheme.

Long Term Agreements on Energy Efficiency and Environmental Permits (status = implemented)

Negotiations between the government and less energy intensive industries have resulted in a second generation of Long Term Agreements on energy efficiency. The government supports these agreements with fiscal incentives such as the EIA, described below, and enforces them with environmental permits. Measures agreed under these agreements are taken over in the permit. Companies which do not participate in the agreements are required (in their permits) to take all energy-saving measures with an internal rate of return of at least 15% after taxes. The national government has devoted € 14 million to enable permitting authorities to step up their activities to reinforce the role of energy measures in environmental permits since 2001.

Energy Investment Tax Deduction (EIA, status = implemented)

The Energy Investment Tax Deduction allows entrepreneurs who invest in relatively innovative energy-efficient technologies or in renewable energy to deduct part of their investment costs from their corporate income tax under certain conditions. The scheme was introduced in 1997. Lists of eligible technologies and equipment are updated annually. The annual budgets for the scheme are presented in the following table.

Table 1-3: Budget EIA, in mln euro per year

1997	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
20	63	70	90	144	253	153	169	137

N_2O

Low N_2O nitric acid production (status = planned)

There are two companies which produce nitric acid in the Netherlands, emitting on average 5.3 Mtonne CO_2-eq. of N_2O emissions per year. The National Climate Policy Implementation Plan identified N_2O reduction from these plants as a reserve measure, to be prepared for future implementation should circumstances warrant such. In 2002 the Cabinet decided to 'activate' this measure, and put it into effect regardless of whether it were necessary for achieving the Kyoto target. A Best Reference Document (BREF) pursuant to Directive 96/61/EC (Integrated Pollution Prevention and Control) is currently being drafted for the fertilizer industry. The BREF (entitled Large Volume Inorganic Chemicals – Ammonia, Acid and Fertilisers) is expected to be completed in mid-2005. The permitting authorities will then have to amend the permits of the installations involved to bring them in line with the BREF by 30 October 2007. The total emission reduction potential of measures in nitric acid production plants has been estimated at 4 Mtonne CO_2-eq. in 2010. How much of this potential will be captured will depend on how the BREF defines Best Available Technology for this process. Several promising technologies are currently under development.

HFC

Low HFC HCFC production (status = implemented)

There is one producer of HCFC-22 in the Netherlands. The *environmental permit* for this plant required installation of an afterburner to reduce emissions of HFC-33. More than € 10 million has been invested in this afterburner since 1997, with the government contributing about € 0.25 million in subsidy for the reserve unit (from the *Reduction Program Non-CO_2 Gases*). The cost-effectiveness of the afterburner has been estimated at € 0.30/tonne CO_2-equivalent [*Harmelink et. al., 2005*].

Reduction Program Non-CO_2 Gases (status = implemented)

In the context of the Reduction Program Non-CO_2 Gases agreements have been reached between government and industry to reduce emissions of HFC's and PFC's resulting from use in stationary cooling equipment, car airco's, foams, spray cans and the semiconductor industry. A ceiling of 0.44 Mtonne has been set on emissions of SF_6/PFC in the environmental permit for the semi-conductor industry.

PFC

Low PFC aluminium production (status = implemented)

The Dutch government has negotiated an *environmental covenant with the aluminium industry* which included emission reduction targets for a large number of pollutants, including both PFC's and CO_2. The government has also provided financial support (amounting to € 1,5 million from two different subsidy programs, the *CO_2 Reduction Program* and the *Non-CO_2 Reduction Program*) for modernisation of one of the two production plants, which resulted not only in reduction of PFC emissions, but also in decreased electricity use and reduced emissions of fine particulates. As of 2003 both of the aluminium production plants located in the Netherlands had switched from Side-Worked Prebake to Pointfeeder Prebake. The environmental permits of the installations concerned set a maximum level on emissions of PFC's.

Summary industry sector

The following box presents a summary of the emission reduction impacts of the implemented policies and measures affecting emissions from the industry sector in the period 1990-2020.

Summary of Emission Reductions in the Industry Sector, in Mtonne CO_2-equivalent avoided emissions per year						
policy cluster	***gas***	***realized***	***projected***			
		2000	***2005***	***2010***	***2015***	***2020***
energy efficiency	CO_2	3.2	0.9	1.4	2.1	2.1
CO_2 emissions trading	CO_2	-	-	0.3	0.5	0.3
low HFC HCFC production	HFC	5.4	1.9	1.9	1.9	1.9
Reduction Program Non-CO_2 Gases	HFC/PFC	--	0.5	1.0	1.0	1.0
low PFC aluminium production	PFC	1.1	1.1	1.1	1.1	1.1
total		9.7	4.4	5.7	6.6	6.4

1.4 Transport

CO_2

Policies and programs which affect CO_2 emissions in the transport sector can be grouped loosely into four main categories. Some of the policies are intended either directly or indirectly to reduce emissions of CO_2, while others are aimed primarily at other policy goals but also generate CO_2 reduction as a welcome side effect. They include the following:

1. Policies aimed at improving *fuel efficiency through technical measures on vehicles* include energy labelling of new vehicles, a rebate on fuel efficient cars which was in effect in 2002, the ACEA covenant with car manufacturers and various subsidy programs such as 'Quieter, Cleaner and More Economical Traffic and Transport in Urban Areas' (Stiller, Schoner en Zuiniger Verkeer en Vervoer in Stedelijk Gebied, SSZ) and the CO_2 Reduction Program/Freight Transport.
2. Policies aimed at improving *fuel efficiency through driving behavior and discouraging vehicle use* such as the program Buy Fuel Efficient! Drive Fuel Effiicient! (Koop Zuinig! Rij Zuinig!, KZRZ) which was followed by The New Driving Force in 1999, stepped up enforcement of speed limits, various tax measures aimed at stimulating econometers, on-board computers and cruise control, and programs aimed at logistical and other measures (such as the programs Rational Energy Use in Traffic and Transport (REV) followed by Energy Savings in Transport (EBIT), Transactie, Ketenmobiliteit, Transportpreventie).
3. Policies aimed at encouraging *modes of transport* with smaller emission impacts (Transactie/Modal Shift, program Korte Ritten, fiscal measures encouraging bicycle use and public transportation).
4. A fourth group is more difficult to categorize since it includes policies with various different kinds of effects. Excise duties on motor fuels have primarily a revenue raising function, but also impact on CO_2 emissions through their effect on fuel prices. The CO_2 Reduction Program/Passenger Transport aims to support investments in materials and the training of municipal officials, while the objective of the EU Biofuels Directive is to encourage use of renewable energy in the transport sector.

The cost effectiveness for the government of the policy instruments deployed in the transport sector during the period 1999-2003 are presented in the following table. For a description of cost estimating methods, see the text box on page 4.

Table 1-4: Cost effectiveness of the policies in the transport sector 1999-2003

instrument	*Mtonne avoided emission in 2003*	*government costs, mln euro*	*annuity, mln euro per year*[1]	*cost-effectiveness, euro/tonne*
The New Driving Force	0.17	13.8	1.7	7 – 14
EU Agreement with car manufacturers	0-0.3	0	0	0
Energy labelling of cars and energy premium	0.12	±50	6.2	±50[2]
Transaction Modal Shift	0 – 0.1	13.3	1.6	16 - ∞
Energy investment tax deduction, EIA	0.1 – 0.2	33	4.1	20 – 40

[1]10 year depreciation period, 4% interest

[2]The reported costs are for the energy premium only, while the avoided emission pertains to both the label and the premium. The cost effectiveness of the premium alone is therefore likely to be higher than the € 50/ton reported.

A number of the policies and programs currently in effect or in the planning stage are described in greater detail in the following sections.

The New Driving Force (status = implemented)
The New Driving Force program has been introduced in two phases, building further on a previous program called Buy Fuel Efficient! Drive Fuel Efficient! The objective of the program is to reduce CO_2 emissions by changes in driving behavior. The program has four different modules: in-car apparatus, licensed drivers, driver education and research. The government made € 11 million available for this program in 1999 and an additional € 10 million for a second phase in the period 2004-2006. Results from the year 2004 indicate emissions savings of about 0.2 Mtonne. Projections indicate avoided emissions of about 0.9 Mtonnes in 2010.

CO_2 Reduction Program/Passenger Transport (status = implemented)
The objective of the subsidy program, which was launched in 2000, is to reduce CO_2 emissions by means of investments in material. The program also covers projects to train municipal officials in the application of energy aware design methods for dealing with traffic in residential neighborhoods. The government has reserved € 4 million per year for this program.

CO_2 Reduction Program/ Freight Transport (status = implemented)
This program makes subsidies available to a wide variety of projects which have to do with transportation of freight and which save fuel and thereby reduce CO_2 emissions. Costs incurred in connection with investment in technology, utilization of technology and outreach activities that reduce CO_2 emissions from transport can be eligible for subsidy under this program. The government has reserved € 3.5 million per year for this program.

Energy Labelling of Vehicles (status = implemented)
Energy labels on vehicles were introduced in the Netherlands in 2001, pursuant to Directive 1999/94/EC. The labels indicate both fuel consumption and CO_2 emissions of new passenger cars. The Netherlands' scheme goes further than that required by Directive 1999/94/EC since fuel consumption is reported in terms of relative fuel consumption compared to other types of cars of similar size as well as in absolute terms.

EU Biofuels Directive (status = planned)
The government announced its intentions regarding the biofuels directive in its Traffic Emissions Policy Document issued in 2004. It is doing its utmost to introduce an incentive scheme for biofuels from 2006. The necessary research and preparation, including the funding, are underway. Results of these preparatory activities will be announced this year. The 2% biofuels target includes niche markets. In addition to reducing CO_2 emissions, another important objective is setting in train innovations which target second generation fuels. Preparations are being made in cooperation with the market (oil companies, chemicals companies etc.) and non-governmental organizations in a such way to avoid lock-in effects (holding on to first generation biofuels too long).

CO_2 differentiation in vehicle purchase tax (status = planned)
The Traffic Emissions Policy Document announced that the government is examining how the amount of purchase tax levied on passenger cars and motorcycles can be linked to vehicle fuel efficiency, with a view to introducing this measure from 1 January 2006. A precondition is that the measure should be budget-neutral. The possibility of exempting hybrid and hydrogen-powered cars which meet certain requirements is also being examined.

N_2O
There are no policies aimed specifically at N_2O emissions from the traffic sector in the Netherlands. NO_x policies have led to more petrol-fueled passenger cars being equipped with catalytic converters, resulting in higher N_2O emissions per kilometer. Since the share of petrol-fueled cars with catalytic converters has increased strongly since 1990, the average N_2O emission factor also rose dramatically in the period 1990-1999 (from 9 to 15 mg/km), dropping again slightly to 12 mg/km in 2003.

Summary transport sector
The following box presents a summary of the emission reduction impacts of the policies and measures affecting the transport sector in the period 1990-2020.

Summary of Emission Reductions in the Transport Sector, in Mtonne CO_2-equivalent avoided emissions per year

policy cluster	***gas***	***realized***	***projected***			
		2000	***2005***	***2010***	***2015***	***2020***
technical measures in vehicles	CO_2	--	0.2	0.4	0.4	0.4
driving behavior/ discouraging vehicle use/shifting modal split	CO_2	--	0.5	0.9	0.9	0.9
other (chiefly excise duties)	CO_2	1.2	--	--	--	--
total		1.2	0.7	1.4	1.3	1.3

1.5 Agriculture

CO_2
The largest agricultural source of CO_2 emissions in the Netherlands is the greenhouse horticulture sector, which is responsible for about 80 per cent of emissions in the sector.
The most important policies affecting CO_2 emissions from geenhouse horticulture are the *Glami Covenant* and regulations referred to as the *Orders In Council Greenhouse Horticulture*. These policies aim at improving energy efficiency and are described in greater detail in the following paragraphs. In addition *Long Term Agreements* on Energy Efficiency have also been negotiated with a number of other agricultural

subsectors. The cross sectoral policies *MEP*, *EIA* and the *CO_2 Reduction Program* also affect CO_2 emissions in the agricultural sector.

Glami Covenant (status = implemented)
In the context of the Glami covenant, agreed with the government in 1997, the greenhouse horticulture sector is striving to improve its energy-efficiency index by 65% in 2010 relative to the baseline of 1980. The energy-efficiency index is defined as primary fuel use per unit product. This means that the index can be improved by a fall in primary fuel consumption, a rise in physical production or a combination of both. Results from the monitoring of the covenant are presented in the following table.

Table 1-5: Development of the energy-efficiency index in the greenhouse horticulture sector

	1980	***1990***	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***	***2002***	***2003[1]***
energy-efficiency index	100	67	60	63	58	60	57	56	52	52	50-51

[1] estimate
Souce: LEI, (2004), *Energie in de glastuinbouw van Nederland; Ontwikkelingen in de sector en op de bedrijven t/m 2003,* Den Haag.

Orders in Council Greenhouse Horticulture (status = adopted)
In addition to the general objective of the Glami Covenant described in the previous paragraph, crop specific energy norms at the level of firms have also been set down in Orders in Council. Greenhouse operators are required to register their energy use per m^2 of greenhouse floor space.

CH_4
There are no specific policies aimed at reducing emissions of the non-CO_2 gases from the agricultural sector although there are programs which subsidize research and development and practical experimentation. As yet these programs have had no measurable effect on emissions.

The milk quota which is part of the Common Agricultural Policy has had an impact on the size of the dairy herd in the Netherlands and on the associated CH_4 emissions. Manure policies which regulate the application of nitrogen to the soil also impact on the size of the livestock population.

N_2O
While there are no specific policies aimed at reducing emissions of N_2O from the agricultural sector, the norms applying to application of manure to the soil and the nitrogen norms applying to total use of manure and artificial fertilizer do have an impact. N_2O emissions, and to a lesser extent CH_4 emissions, fall as these norms become more stringent. However, manure management rules aimed at reducing emissions of ammonia (NH_3) have the opposite effect on N_2O emissions. Injecting manure into the ground results in suboptimal nitrification and higher N_2O emissions than spreading manure on the surface, but is necessary in order to keep NH_3 emissions in check.

Summary agriculture sector

The following box presents a summary of the emission reduction impacts of the policies and measures affecting the agriculture sector in the period 1990-2020.

Summary of Emission Reductions in the Agriculture Sector, in Mtonne CO_2-equivalent avoided emissions per year						
policy cluster	***gas***	***realized***	***projected***			
		2000	***2005***	***2010***	***2015***	***2020***
energy savings in greenhouse horticulture	CO_2	0.9	0.2	0.4	0.8	0.7
livestock reduction	CH_4	2.0	0.1	0.3	0.15	--
manure management	N_2O	-1.5	0.4	0.6	0.3	--
total		1.4	0.7	1.3	1.25	0.7

1.6 Forestry

CO_2

The *National Ecological Network* and creating *recreational facilities* are the most important goals of the national forestry strategy. Combating climate change is just one of the benefits of this strategy.

The creation of around 728,500 hectare of National Ecological Network by 2018 is a central theme of nature policy. The National Ecological Network is a cohesive network of high quality nature reserves on land and in the water. Around 275,000 hectare must be added to the current area of nature reserves to complete the network. Only a part of this area will be afforested.
To counter the continuing shortage of day recreational facilities in urban areas around 20,000 hectare of large scale green areas will be created by 2013. Only a part of this area will be afforested.

1.7 Waste

CH_4

Government policies include both those aimed at reducing the amount and composition of waste to be dumped and those aimed at collection and utilization of landfill gas for energy production.

The general objective of waste policies is to reduce the amount of waste generated and dumped. Waste should be dumped at landfill sites only when there is no other waste treatment option available. The amount of dumped waste fell from 14 Mtonne in 1990 to about 5 Mtonne in 2000 and is still decreasing. It has been estimated that this reduction in the amount of waste to be dumped reduced methane emissions by 4 Mtonne CO_2-equivalents in 2000 [*Jeeninga et.al., 2002*]. This was achieved through a variety of policies and measures, such as separate collection of vegetable, fruit and garden waste from other household waste, useful application of waste, the expansion of incineration capacity, and discouraging waste dumping through landfill bans and high dumping tariffs contained in environmental taxes.

Policy instruments deployed to encourage the collection and utilization of landfill gas include regulations as well economic instruments (subsidy programs and tax incentives). The regulations (*Environmental Management Act*, (NeR, 1994), *Decree on Soil Protection from Landfills* (1993) and *Decree on Landfills and Waste Landfills Bans* (1997)) are aimed at both reducing methane formation and at reducing emissions while the landfill is in operation and after it has been closed.

Total investment costs for landfill gas collection and utilisation projects in the period 1990-2003 have been estimated at € 35 to 55 million [*Harmelink et.al., 2005*]. Financing of these investments is very site specific. The landfill gas extraction part of the project is generally financed from dumping charge revenues. In addition, there has been financial support from governmental programs and energy companies for projects which utilize landfill gas in energy production. The following table provides an overview of such financial support.

Table 1-6: Financial support programs for landfill gas collection and utilization

Name of program	***Type of program***	***Period***	***Financial support***
Environmental Action Plan of the energy companies (MAP)	Subsidy for utilisation of landfull gas for energy production	1990-2000	€ 2 to € 4 million
Energy Tax Exemption	Energy production from landfill gas defined as renewable energy and exempted from the Energy Tax	1996-2003	Value of the exemption estimated at € 10 – 15 million
Energy Investment Tax Credit (EIA)	The EIA is available for landfill gas collection and utilisation projects.	1997 – present	Financial support in period 1997-2003 € 0.6 million.
Environmentally Friendly Electricity Production Program (MEP)	The MEP provides operating subsidies for electricity produced from renewable sources. It replaced the Energy Tax Exemption in 2004.	2004 – present	Since 1 July 2004 there is a subsidy available for electricity generated from landfill gas, amounting to € 0,006/kWh.
Non-CO_2 Reduction Program	This program has provided financial support for demonstration projects involving increasing landfill gas production from sites and methane oxidation in top layers.	1999 – present	The total budget for demonstration projects amounts to € 0.7 million.

Source: [*Harmelink et. al., 2005*]

EU Landfill Directive (status = implemented)
Annex 9 provides an overview of how the Landfill Directive has been implemented in the Netherlands, mainly through amendments to previously existing rules and regulations.

Summary waste sector
The following box presents a summary of the emission reduction effects of the policy measures affecting the waste sector in the period 1990-2020.

Summary of Emission Reductions in the Waste Sector, in Mtonne CO_2-equivalent avoided emissions per year						
policy cluster	***gas***	***realized***	***projected***			
		2000	***2005***	***2010***	***2015***	***2020***
landfill policies	CH_4	4.0	3.0	4.0	5.0	6.0

1.8 Buildings sector (households and services)

CO_2
The package of policies deployed in this sector has been designed to address specific issues in three different segments of the target group: new buildings, retrofit of existing buildings, and appliances. The package consists of a mixture of regulations, economic instruments and information and outreach programs, supported by an energy tax. Agreements have been negotiated with important

intermediary parties in the residential sector (such as housing developers and local governments) and with branch organizations in the non-residential sector.

The main policy instrument pertaining to new buildings in both residential and non-residential sectors is the *Energy Performance Norm*.

The most important framework for encouraging energy conservation in existing residential buildings (including appliances) during the period 1990-2000 was the *Environmental Action Plan (MAP)* of the energy companies, which provided both information and financial support for measures to save energy. Financial support continued after the MAP expired in 2000 in a somewhat modified form in the *Energy Premium Rebate (EPR)* program, in effect from 2000 to 2005. The EPR has been repealed but may be replaced with a scheme for subsidizing large-scale projects in existing buidings through a system of tenders, for which the government has made € 34,5 million available if needed. Information on energy saving potential is currently provided through the *Energy Performance Advice* (EPA) program. The MAP and EPR schemes built upon the EU directives on energy labelling of appliances, on the basis of which the most energy efficient appliances can be recognized by their so-called A-label. The government has given energy conservation in buildings an extra boost through agreements signed with provincial and municipal governments (*Climate Covenant*) and umbrella organisations of housing developers (*Sustainable Buildings Covenant*). The energy tax increases the impact of programs and policies aimed at increasing energy conservation in existing buildings because it improves the cost-effectiveness of energy savings measures for the owners.

Various polices have been introduced to encourage energy savings in non-residential buildings. Financial support has been available, first through the *MAP* (1990-2000) and since 1997 also through the *Energy Investment Tax Deduction (EIA)* for commercial firms (1997-present) and the *Energy Investment Subsidy Program for non-Profit Organizations* (*EINP*, 1997 – 2002). *Variable depreciation of energy investments* under the corporate income tax (*Vamil*) was possible from 1997 until 2002. *Long- term agreements on energy efficiency* (*LTA's*) have been signed with a number of subsectors and a start has been made with setting energy use standards based on the *Environmental Management Act*. The *energy tax* increases the impact of these programs and policies as well as it makes investments in energy savings more cost-effective for building owners.

An ex post evaluation of the climate change policies in the buildings sector carried out in 2003[1], estimated the cost-effectiveness of the policies in effect in the buildings sector in the period 1995-2002. Cost-effectiveness was estimated using three different methods, namely the government costs approach, the financial costs approach (also called the final users approach) and the national costs method. These methods are explained further in the text box on page 4.

The following table shows the results of this study.

[1] [*Joosen et.al.,2004*]

Table 1-7: Cost-effectiveness of policies in the buildings sector in 1995-2002

	Mtonne avoided emission in 2002	***government costs euro/tonne***	***financial costs euro/tonne***	***national costs euro/tonne***
Residential Buildings				
Energy Performance Norm (EPN)	0.1 - 0.2	4 - 14	-210 - -6	51 – 121
Energy Premium Rebate (EPR) and Energy Performance Advice (EPA)[1]	0.2 – 0.3	285 - 322	-238 - -155	45 – 117
Environmental Action Plan (MAP)	0.3 - 0.5	32 - 69	-53 - -5	36 – 69
energy tax	0.8 - 2.4	--	--	--
Non-residential Buildings				
EPN	0.1 - 0.3	3 - 12	-146 - +18	-51 - +39
energy tax	0.1 - 0.6			
EIA/Vamil	0.1 - 0.5	13 - 67	-206 - +6	-71 – +26
EINP	0.2 - 1.0	8 - 47	-49 - +53	-7 - +38
LTA	0.0 - 0.1	60 - 191	-309 - +52	-115 - +39
MAP	0.2 - 0.4	27 - 69	-164 - +110	-34 - +137

[1] The relatively high cost-effectiveness numbers for the EPR are in large due to the fact that the scheme was intended not only to reduce CO_2 emissions, but also to increase penetration of renewable energy options in buildings. Photovoltaic solar panels were heavily subsidized under the program. Renewable energy in buildings is generally much less cost-effective than energy conservation when measured against avoided CO_2 emissions.

A number of policies and measures affecting the buildings sector are described in greater detail in the following paragraphs.

Energy Performance Norm (EPN, status = implemented)
The Building Code in the Netherlands was amended in December 1995 to make possible tighter regulations pertaining to energy use in new residential buildings. The object was to realize energy savings of 15 to 20 percent relative to the standards that existed before the Building Code was amended. The standard is expressed as a coefficient. The lower the value of the coefficient, the better the energy performance in the buildings. The coefficient for residential buildings was set originally at 1.4 or lower (approximately equivalent to 1400 m^3 natural gas use per dwelling per year), and tightened to 1.2 or lower as of 1 January 1998 (approximately 1200 m^3 per year) and to 1.0 or lower as of 1 January 2000 (approximately 1000 m^3 per year). The government has announced that the coefficient for residential buildings will be tightened to 0.8 as of 2006. The EPN for non-residential buildings differs by type of building and has been tightened twice since its introduction in 1995, as shown in the following table. The government is currently investigating whether the standard for certain types of buildings can be tightened further.

Table 1-8: EPC standards for non-residential buildngs

in force from	*15 Dec 1995*	*01 Jan 2000*	*01 Jan 2003*
type of building			
meeting (e.g.theater, museum)	3.4	2.4	2.2
prison	2.3	2.2	1.9
non-clinical health care	2.0	1.8	1.5
clinical health care	4.7	3.8	3.6
hotel, restaurant, café	2.2	1.9	1.9
office	1.9	1.6	1.5
accomodation	2.4	2.1	1.9
education	1.5	1.5	1.4
sport	2.8	2.2	1.8
retail sales	3.6	3.5	3.4

Energy Tax (status = implemented)
This tax on natural gas and electricity has been in effect since 1996. Called the regulatory energy tax when it was first implemented, it has become known simply as the energy tax since 2004. It was introduced as part of an operation to 'green' the tax system in the Netherlands. The revenues raised by the tax are returned to taxpayers through reductions in taxes on income. The objective of the tax was therefore twofold: to encourage efficient use of energy and reduce CO_2 emissions from small scale users of energy, and to provide revenues to cover the costs of lowering direct taxes. The rates of the tax have been raised several times since 1996, and other modalities of the tax have also been changed. Some of these changes were made as part of the implementation of the EU energy tax (Directive 2003/96/EC) in the Netherlands.
The current tax rates are presented in the following table.

Table 1-9: Rates of the energy tax as of January 2005

	1996	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
natural gas (€ct per m^3)										
1-5000 m^3	1.45	2.89	4.33	7.17	9.46	12.05	12.40	12.85	14.29	14.94
5001-170,000 m^3	1.45	2.89	4.33	4.65	5.20	5.63	5.79	6.00	7.27	10.19
170,001-1 mln m^3	0	0	0	0.32	0.70	1.05	1.07	1.11	2.27	3.11
1 mln – 10 mln m^3	0	0	0	0	0	0	0	0	1.13	1.15
>10 mln m^3 non-commercial	0	0	0	0	0	0	0	0	1.06	1.07
>10 mln m^3 commercial	0	0	0	0	0	0	0	0	0.75	0.76
Electricity (€ct per kWh)										
1-10,000 kWh	1.34	1.34	1.34	2.22	3.73	5.84	6.01	6.39	6.54	6.99
10,001-50,000 kWh	1.34	1.34	1.34	1.43	1.61	1.94	2.00	2.07	2.12	2.63
50,001-10 mln kWh	0	0	0	0.10	0.22	0.60	0.61	0.63	0.65	0.86
>10 mln kWh non-commercial	0	0	0	0	0	0	0	0	0.10	0.10
>10 mln kWh commercial	0	0	0	0	0	0	0	0	0.05	0.05

This tax is based on degressive tax rates, but the tax is paid over every bracket. So if a company uses 200,000 m^3 of natural gas per year, for example, they pay €ct 14.29 per m^3 over the first 5000 m^3, €ct 7.27 per m^3 over the m^3's falling between 5000 and 170,000, and €ct 2.27 per m^3 over the m^3 falling between 170,000 and 200,000.

Climate Covenant with provinces and municipalities (status = implemented)
The Climate Covenant is an agreement between central government, the provinces and the municipalities (signed in 2002) regarding efforts to be undertaken by the lower governments in support of national climate change policy. The objective of this instrument is to encourage lower government efforts to reduce emissions, especially through their housing programs and use of renewable energy.The agreement is coupled to a subsidy program which makes funds available for governmental initiatives in these areas. The budget for this scheme is about € 35.6 million. As of 31

December 2004, 204 municipalities and 9 provinces had submitted subsidy applications under this program.

EU Directive on Energy Performance of Buildings (EPBD)(status = adopted)
Several of the requirements contained in the EPBD, such as the setting of energy standards for new construction and major renovation, have already been implemented in the Netherlands. Those still remaining to be implemented generally require only marginal changes to existing policies, such as the EPA and the EPN. The energy certificate required by the EPBD is not expected to generate any direct CO_2 effect in the Netherlands, but it will contribute to awareness building, as will the mandatory renewable energy feasibility study for large buildings.

Summary buildings sector
The following box presents a summary of the emission reduction effects of the policy measures affecting emissions from the buildings sector in the period 1990-2020.

Summary of Emission Reductions in the Buildings Sector, in Mtonne CO_2-equivalent avoided emissions per year						
policy cluster	***gas***	***realized***	***projected***			
		2000	***2005***	***2010***	***2015***	***2020***
energy performance new buildings	CO_2	0.8	0.3	1.1	2.2	3.7
retrofit existing buildings	CO_2	1.8	0.5	1.0	1.5	1.9
energy efficiency appliances	CO_2	1.0	0.3	0.6	0.8	1.0
total		3.6	1.1	2.7	3.5	6.6

1.9 Supplementarity of Netherlands climate change policy

Member States face two reporting requirements pertaining to the supplementarity of their national climate change policies. Decision 280/2004/EU requires Member States to report on the extent to which domestic action actually constitutes a significant element of the efforts undertaken at national level as well as the extent to which the use of joint implementation, CDM and international emissions trading is actually supplemental to domestic actions. The Linking Directive requires Member States to report on the extent to which domestic action actually constitutes a significant element of the efforts undertaken at a national level as well as the extent to which use of the project mechanisms is actually supplemental to domestic action, and on the ratio between domestic action and the project mechanisms.

Definition questions
There are no internationally agreed definitions for the terms 'domestic actions', 'significant' or 'total efforts'. The following paragraphs therefore describe how these terms have been defined for the purposes of this submission.

First, domestic actions are defined as measures taken by companies, private citizens and government which lead to lower emissions of greenhouse gases in the Netherlands than would have occurred in the absence of those measures.

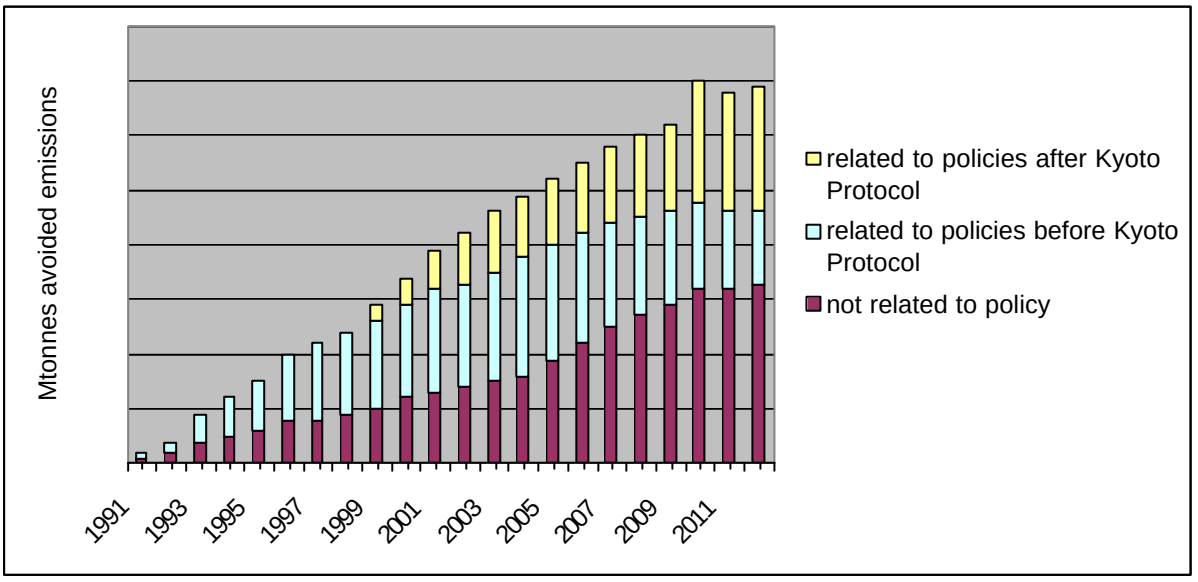
Second, given the requirement in the Linking Directive to report on the ratio between domestic actions and use of the project mechanisms, it is necessary to define indicators of total efforts which allow for quantitative comparisons. Three such indicators which can be linked to measures taken by companies, citizens and government, are avoided emissions (or emission reductions), costs incurred and investments.

In this submission 'avoided emissions' is used as the primary indicator of effort. Emission reductions provide after all a common denominator allowing for comparison between the effects of domestic actions and the effect of using the project-based mechanisms. However, insight is also provided into 'costs incurred' and 'investments' as indicators of effort, since the ratio between domestic action and use of the project mechanisms changes considerably depending on which indicator is used.

Third, in assessing how 'significant' such actions are, this submission distinguishes among three sets of domestic actions. The largest set of actions encompasses all measures taken since 1990 which still have an impact on emissions in 2010. Within this set of total measures a subset is identified consisting of those which can be linked to government policies (for example, because they are taken in order to comply with regulations or because they are financed partly through subsidy programs or prefential tax treatment). The set of policy-related actions is then further subdivided according to the period in which the policy in question was introduced, before or after the Kyoto Protocol was signed in 1997. This distinction makes it possible to separate the stepped up policy efforts made in response to the Kyoto Protocol from the policy efforts which already being made before the protocol was signed.

Figure 1-1 aids in visualizing the distinctions drawn by these definitional issues. The figure presents in a stylized form the indicator 'avoided emissions' for the years 1990 through 2012.

Figure 1-1: Avoided emissions due to domestic actions



The figure shows that emissions are avoided every year as a result of measures taken in the past. For example, if a household buys a solar powered hot water boiler in 1997, then it avoids the emissions that would otherwise have been caused by its use of natural gas for heating water over the whole life of the boiler. The effort is made in 1997 with the purchase of the boiler, the effect of the effort occurs annually every year until the boiler is written off, and the annual avoided emission is the indicator of the effort. If the boiler was purchased in response to a policy instituted by the government, then the avoided emission is considered to be policy related.

Results

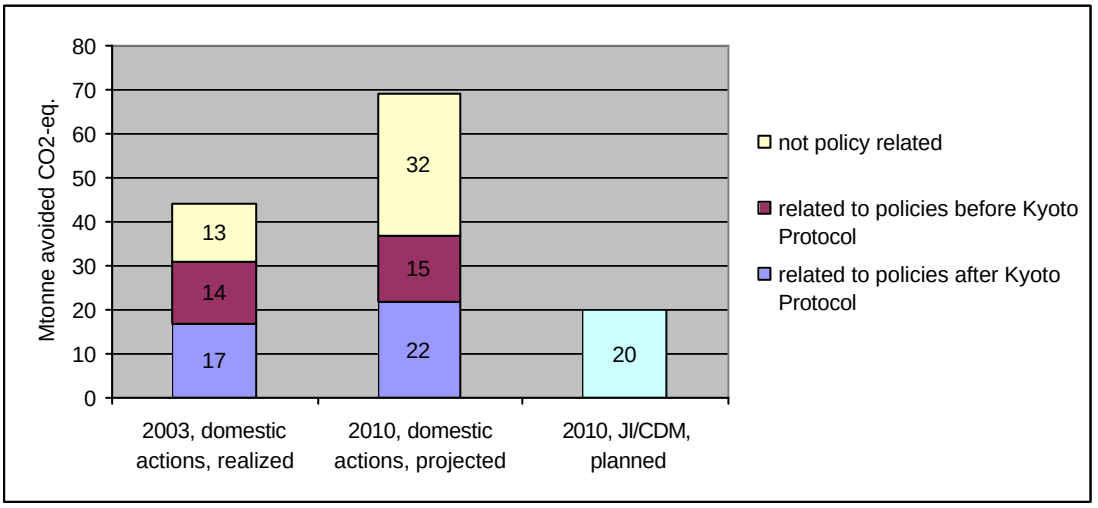
In quantifying the indicators of domestic effort, a methodological distinction was made between efforts realized in the period 1990-2003, and efforts projected in the period 2004-2010. Specific studies ([*Boonekamp et.al., 2005*] and [*Harmelink et. al., 2005])* were commissioned to determine ex post the quantity of emissions avoided by domestic actions taken in the period 1990-2003. The projections of future emission reductions were based largely on [*Dril et. al., 2005*] . The background scenario for the projections was the Global Economy scenario described further in section 2.2 and the policy variant was the 'with measures' projection described in section 2.3. The results are presented as avoided emissions in the year 2010, chosen because it is considered representative of the commitment period 2008-2012. The results are presented in the following table.

Table 1-10: Avoided emissions in 2010 due to domestic efforts in the period 1990-2012

type of effort	***Mtonne avoided CO_2-equivalents in 2010***		
	CO_2	***Non-CO_2***	***total***
related to policies instituted after the signing of the Kyoto Protocol	18	4	22
related to policies instituted before the signing of the Kyoto Protocol	10	5	15
not policy related	32	0	32
total domestic efforts	60	9	69

The government intends to use the project-based mechanisms to purchase 100 Mtonne CO_2-equivalent emission reductions during the commitment period, an average of 20 Mtonne per year. The following figure indicates how those 20 Mtonne compare to the indicators of domestic effort presented in Table 1-10. The figure also presents the realized emissions reductions in the year 2003 separately to illustrate the difference between the actual efforts thus far and the projected efforts during the coming years. (The figures for 2010 already reflect the realized effects in 2003. The two sets of figures can therefore not be added together.)

Figure 1-2: domestic actions related to government use of JI and CDM in 2010



The effect of CO_2 emissions trading in the projections of avoided emissions requires special attention when interpreting the results of Figure 1-2. Based on assumptions about the CO_2 price in Europe in the period 2008-2012 (described further in Annex 5), the analysis identifies cost-effective investments in CO_2 reduction within the Netherlands. The effect of these investments is expressed as avoided emissions and is included in Figure 1.2.

As Figure 1-2 shows, the ratio between domestic actions and use of the project-based mechanisms depends on which domestic actions are included in the comparison. Avoided emissions due to total domestic efforts leads to a ratio of 69/20, while policy related efforts result in a ratio of 37/20. If only the efforts related to policies introduced after the signing of the Kyoto Protocol are included, then the ratio drops to 22/20.

When costs or investments are used as an indicator of effort rather than avoided emissions, the ratio of domestic efforts to use of the project-based mechanisms becomes even greater. The government has reserved about € 600 million for purchasing emission reductions via the mechanisms during the period 2008-2012, or an average of € 120 million per year. The annual net cost of total domestic actions affecting CO_2 in 2010 has been estimated in [*Boonekamp, 2005*] at € 2900, more than a factor 20 higher, while total investments affecting CO_2 over the period 1990-2010 have been estimated at € 57 billion.

2. Projections

The projections described in this chapter are taken mainly from [*Dril et.al., 2005*]. Emissions associated with two socio-economic scenarios (given the names Strong Europe and Global Economy) are presented for three different policy variants ('without measures', 'with measures' and 'with additional measures'). The methodologies and assumptions underlying the projections are described in sections 2.1, 2.2 and 2.3.

Section 2.4 presents results for the years 2005, 2010, 2015, and 2020, subdivided by gas and by sector. Emission projections for international marine and aviation bunkers located in the Netherlands are described in section 2.5, while section 2.6 is devoted to uncertainty and sensitivity analyses. Section 2.7 describes the preliminary results of projections of the carbon balance in Dutch forests.

2.1 Description of methodologies, models

Autonomous social developments are reflected in growth series for activity data (industrial production, passenger-km, livestock numbers, etc.). These developments result in turn in a demand for energy, including non-energy-use of fuels (e.g. feedstock). Efficiency improvements also play an important role. These are modelled, based on assumptions about technological progress, policies and developments in energy prices and the incentive these produce for investing in energy conservation. Subsequently the energy supply is modelled. The final step is the calculation of emissions.

Macro-economic and sectoral growth projections are derived from modelling exercises performed by the Netherlands' Bureau for Economic Policy Analysis (CPB) using the Athena model [*Vromans, 1998]*. This model determines economic growth in approximately 20 different sectors. Macro-economic consistency is assured based on data regarding population and the labour market. Information on the international demand for products and prices is based on calculations carried out with the Worldscan general equilibrium model [*Geurts, 1993]* and is used as an input to Athena.

The economic growth output of the Athena model is further differentiated into about 60 subsectors, which are important for emissions, and together with information on developments in physical production capacity, are used as input for the SAVE model by the Netherlands' Energy Research Center (ECN) [*Boonekamp, 1994]*. SAVE was originally designed to project energy use and energy efficiency improvement with both key economic parameters and structural developments as input. Results from earlier runs of the SAVE model have been compared with the NEMO model of the CPB. The comparison between NEMO, a top-down model, and SAVE, a bottom-up model, resulted in improvements to both models.

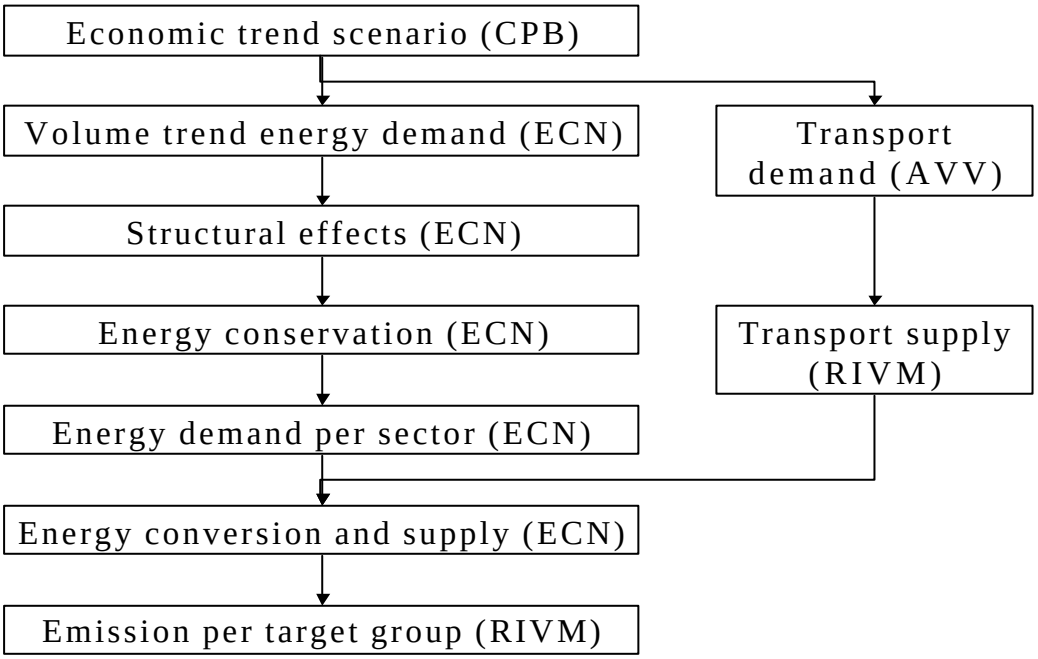
The SAVE model contains submodules for the sectors households, services, industry and agriculture. These modules simulate final energy use based on extensive information about technologies. The SAVE model also takes the effect of environmental and energy policies into account. The development of energy demand can be decomposed into a volume, a structural, a climate, and an energy saving effect.

ECN uses several models for energy supply. Simulation models comparable to SAVE are used to project renewable energy, production of natural gas, and growth in combined heat and power. Road and rail traffic is simulated with the Transport Research Centre's (AVV's) national system of models, based on a spatial planning model and economic data from the CPB. The energy use of the transport sector is

calculated by the Bureau for Environmental and Nature Policy Analysis of the National Institute of Public Health and Environment (MNP/RIVM), taking into account information from the Netherlands Railways, the Netherlands Aviation Safety Board and the Transport Research Centre. ECN uses the linear programming model SERUM to calculate production streams in the petroleum refining sector. The POWERS model, which was recently developed in cooperation with Erasmus University of Rotterdam [*Rijkers, 2001]*, generates equilibrium in the electricity market based on final demand for electricity and determines electricity supply and prices simultaneously. POWERS is a multi-actor adaptive model of the Dutch electricity market. This means that the decisions regarding production volume, allocation of the plants, and price setting made by each market player are based on information from the previous period. Finally, the linear programming model SELPE is used to generate physical equilibria for all energy streams.

The outputs of SELPE, fuel combustion and the non-energy-use of fuels per sector, are used to calculate the energy related CO_2 emissions per sector. Based on sectoral figures from CPB, ECN and MNP/RIVM (transport), MNP/RIVM also calculates the non-CO_2 greenhouse gas emissions per sector. In this calculation climate policy affecting non-CO_2 greenhouse gases is taken into account.

Figure 2-1 :Sequence of calculations and input of various institutes



Several important changes have been introduced into the approach for projecting future emissions since publication of the previous Reference Projection in 2002. It is important to keep these changes in mind when comparing the projections reported in this submission to projections reported previously or to inventory data as reported in the Netherlands National Inventory Report 2004. The approaches used in [*Dril et. al., 2005*] are consistent with those applied in the National Inventory Report 2005 [*NIR, 2005*]. However, NIR 2005 had not yet been finalized when the projections described in this submission were being prepared. The emission figures for the years 2000-

2002 reported to the European Commission on 15 January 2005 therefore form the starting point for the projections presented in this chapter.

The most important changes in the approach include the following. First, sectoral definitions have shifted slightly to align more closely with IPCC source categories and Dutch government departments' policy responsibilities for certain sectors. Where formerly combined heat and power joint ventures were allocated to the industry sector using the heat, they are now included under electricity production in the energy sector. Off-road vehicles and mobile equipment such as tractors, earth moving equipment and the like, are now included under the transport sector, rather than in the sector where they are used, as was the case in the past. Annex 4 shows how IPCC source categories are allocated to sectors for the purposes of the projections reported in this chapter.

Second, the projections now take account of the trend towards rising outside air temperature observed in the past decades. In the past, projections of future energy use for space heating were based on the assumption that future temperatures would remain constant at the average level of the past thirty years. Now it is assumed that there will be a structural rise in outside air temperatures in the future. The effect of this new method for dealing with expected outside air temperature is presented in the following table. More information about this 'climate change correction' is presented in the text box on page 26.

Table 2-1: Impact of the new method of accounting for rising temperatures, expressed as changes in Mtonne CO_2 emissions per year relative to the former method

		SE		***GE***	
	2000	***2010***	***2020***	***2010***	***2020***
direct impact on installations used for space heating	-3	-4.3	-5.4	-4.3	-5.5
impact of additional investment in and use of cooling equipment	0	0.6	1.6	0.7	1.8
reflected in the scenario's	-3	-3.7	-3.9	-3.6	-3.7
estimated impact of fewer investments in insulation	0	0-0.1	0-0.2	0-0.1	0-0.2
estimated impact of car airco and other effects	0	-0.2-+0.2	-0.5-+0.5	-0.2-+0.2	-0.7-+0.7

Finally, adjustments have been made to data regarding historic emissions as a result of new insights acquired during the preparation of the Netherlands' National System under article 5 of the Kyoto Protocol. The most important changes relative to the National Inventory Report 2004 are described in the National Inventory Report 2005. On balance the adjustments have little impact on the total emissions of greenhouse gases in the base year. However, they do result in a shift between CO_2 and the non-CO_2 gases, with CO_2 being lower than previously thought and the non-CO_2 gases being higher.

2.2 Description of scenario's

The scenario's underlying the emission projections described in this chapter have been derived from two of four economic scenario's described in [*Bollen et.al., 2004*][2]. The projections are based on a further elaboration for the Netherlands of two of these European scenario's, namely Strong Europe (SE) and Global Economy (GE). While

[2] Except for the transport sector which relies on the emissions projections which underpin the Traffic Emissions Policy Document issued by the government in 2004. More information about the projections for the transport sector can be found in [*Brink, 2003*].

both scenario's reflect a world with broad international cooperation, they differ in their orientations.

International cooperation is coupled to public responsibility in SE. European institutions are reformed and the EU grows into a stronger economic and political block. The United States becomes part of a worldwide climate coalition pursuing successful policies which make extensive use of the Kyoto mechanisms. The public responsibility orientation is expressed though relatively even income distribution, greater social security and investments in education and research. A reasonable rate of economic growth is achieved due mainly to the larger markets. Annual average growth in Gross Domestic Product between 2002 and 2020 amounts to 1.7 per cent.

Adjustment to the method for correcting for climate change

During the past twenty years winters have become much warmer on average than they were earlier in the 20th century. However, previous projections of future emissions were unable to take this structural warming into account. In estimating future energy use, it was assumed that winters would follow the same temperature patterns that they had in the past. In the last Reference Projection 2001-2010, energy use in the base year was corrected on the basis of a 30 year progressive average over the period 1972-2001. The use of this approach meant that some account was taken of the fact that winters were becoming warmer on average. However, the same approach was also used in projecting the future, which implicitly meant that the warming trend was not assumed to continue into the future. A recent study [*Visser 2005*] by the National Institute for Public Health and Environment (RIVM) has provided a statistically reliable method for projecting the warming trend into the future.The results are compatible with calculations made by the Royal Netherlands Meteorological Institute (KNMI) with climate models for the near future (up to 2020). The projections presented in the Reference Projections 2005-2020 use this new method, which means they reflect the assumption that winters will continue to become warmer in the future.They also reflect the assumption that summers will become warmer, resulting in increased demand for cooling. These assumptions affect the results of the projections. This most important impacts have been quantified and included in the new projections. Other impacts have been inventoried and roughly estimated. The impacts are:

- Decreasing use of installations for space heating in homes, non-residential buildings and greenhouses. This effect has already occurred and is therefore reflected in historic data.
- More investments in cooling equipment. This impact is relatively uncertain and occurs through both purchases of cooling equipment and installation of heat pumps in new buildings.
- More intensive use of cooling equipment in buildings. This impact occurs mostly in non-residential buildings which already have cooling equipment.
- Fewer investments in insulation and efficient boilers since these investments become less attractive with warmer temperatures. This has a limited impact on energy savings in existing buildings.
- Greater use of air conditioning in cars. This impact has been estimated at no more than 0.1 Mtonnes in 2010.
- Other impacts, such as more cooling of products, changes in consumption patterns, and changes in the efficiency of electricity generation, are small compared to the impact on space heating and cooling.

GE is oriented sharply towards international trade but little political cooperation. A strong emphasis on the personal responsibiity of citizens and corporations results in relatively high economic growth and material welfare. Population growth is highest in the GE scenario. Environmental awareness is not translated into strong regulations and international climate policies fail over the longer term, although in western

Europe climate policy remains strong until 2020. Gross Domestic Product grows by 2.7 per cent per year between 2002 and 2020.

Assumptions regarding nuclear energy differ after 2013 in the two scenario's. The Netherlands' one remaining nuclear plant is assumed to close in 2013 in SE, but continues to operate after 2013 in GE.

Another important difference between the two scenario's is the amount of new coal capacity built. In SE power companies expect the CO_2 price to rise and therefore invest in renewable energy and gas rather than in coal while in GE investors assume that emission ceilings will not be tightened over time and that the CO_2 price will not rise. This assumption leads to investment in 2000 MW of new powder coal capacity after 2010.

Annex 3 of this submission provides in tabular form information on the mandatory parameters for descriptions of projections outlined under point 1 of Annex IV to the Implementing Provisions pursuant to Decision 280/2004/EC.

2.3 Description of policy variants

Annex 5 provides an overview of how each policy measure is included in the three policy variants, 'with measures', 'without measures' and 'with additional measures'. The policy names used are the same as in Chapter 1 on Policies and measures.

The 'with measures' variant

Existing Dutch and EU policies[3] in the areas of energy and climate are assumed to continue in the 'with measures' variant in both SE and GE. Existing policies are those which have been either adopted or implemented as of 1 December 2004. Where existing policy instruments are tied to an expiration date, such as is the case with long term agreements and covenants, it is assumed that the policy pressure which they represent will be continued after the expiration date. Where policy instruments are still in a very early stage of development, such as is the case with CO_2 emissions trading, plausible developments in these instruments are assumed. These assumptions are described in detail in [*Dril et.al., 2005*].

The text box on this page indicates the policies included in the 'with measures' variant.

Policies included in the 'with measures' variant

- CO_2 Emissions Trading
- Energy Tax
- EPA, EPR
- EPN, EPC
- EIA, Vamil, EINP
- CO_2 Reduction Program/General
- Benchmarking Covenant
- LTA's, environmental permit
- Glami Covenant, Orders in Council Greenhouse Horticulture
- MEP, Coal Covenant, BLOW covenant
- EU Agreement with car makers
- Energy labelling cars and appliances
- Excise duties on motor fuels
- Enhanced enforcement of speed limits
- The New Driving Force
- CO_2 Reduction Programs/Passenger and Freight Transport, SSZ
- Reduction Program Non-CO_2 Gases
- Covenant with oil and gas producers
- Milk quota, manure management
- Landfill policies
- Low-HFC HCFC production
- Low-PFC aluminium production

The 'without measures' variant

The 'without measures' variant shows how emissions would develop in the absence of all climate change policies since 2000. The policy effects already realized before 2000 are included in the baseline scenario's. The summary tables presented for each

[3] Annex 1 describes links between national policies and EU policies while Annex 9 indicates how EU policies and measures have been implemented in the Netherlands.

sector in Chapter 1 on Policies and measures provide an indication of the magnitude of the effects already realized.

The 'with additional measures' variant

The 'with additional measures' variant reflects the range of impacts of six policies which are currently either in the planning or study stage in the Netherlands. These policies, if implemented, would generate impacts which are additional to the impacts already reflected in the 'with measures' variant.
The six additional policies considered in this variant as well as something about the status of each are described in the following table.

Table 2-2: Policies included in the 'with additional measures' variant

policy	***status***
CO_2 Tender Scheme for Buildings, with a budget of € 34.5 million, to support large-scale projects in the buildings sector	Implementation depends on need for extra measures in order to meet CO_2 target for buildings sector
CO_2 differentiation in purchase tax on new cars and purchase tax exemption for hybrid cars, as announced by the government in the Traffic Emissions Policy Document in 2004.	Uncertain whether this instrument will be introduced. The Traffic Emissions Policy Document announced that the instrument would be studied with an eye to implementation in 2006.
Kilometer charge. The Mobility Policy Document (issued by the government in 2004) noted two price variants to be studied. The 'additional measures' variant therefore presents a range of possible emission impacts.	Uncertain whether this measure will be introduced before 2010. Effect depends on variant chosen.
Biofuels policy, assuming a target of 2% in 2010.	Uncertain whether this measure will be introduced before 2010.The Traffic Emissions Policy Document announced a target of 2 per cent in 2006.
Technical measures to reduce N_2O emissions from the nitric acid production industry.	Effect will depend on Best Reference Document pursuant to IPPC Directive, espected to be completed in mid-2005.
Implementation of the EU F-gases regulation.	Autonomous improvements in leakage rates from car airco's are already assumed in the scenario's; extra impact expected from regulation after 2015.

2.4 Results

Annex 6 presents the emissions projections by sector and gas for each scenario, policy variant and year following the template produced by the UNFCCC Workshop on Emissions Projections held in Bonn from 6 to 8 September 2004. Annex 7 presents the mandatory indicators listed in Annex III of the Implementing Provisions. The following paragraphs provide a summary of the results for emissions and the total effect of policies.

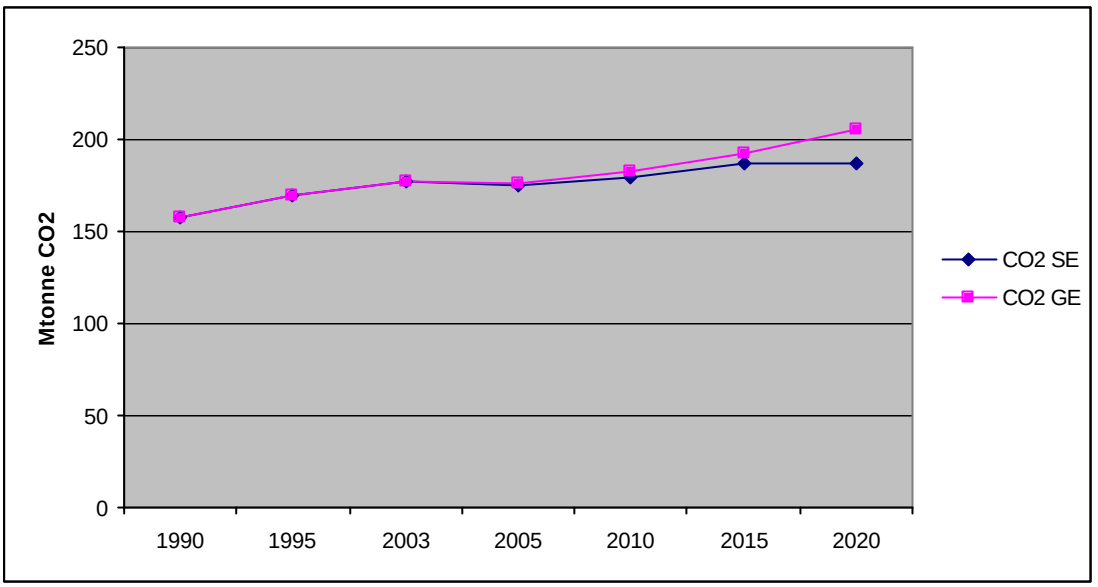
Emissions of greenhouse gases

CO_2 emissions

In the 'with measures' variant domestic CO_2 emissions grow by on average 0.6 per cent per year until 2015 in the SE scenario and then stabilize at around 220 Mtonne per year. In the GE scenario CO_2 emission growth is relatively constant between 2000 and 2020 at about 0.9 per cent per year, a bit less than the growth in total energy use. It should be noted that the projected CO_2 emissions in the 'with measures' variant are higher in 2010 than the actual emissions in 1990 and 2003. This is possible due to the government's decision to purchase 100 Mtonnes of emissions reductions by means of the Kyoto mechanisms and the projected

reduction of the non-CO emissions. The growth occurs largely in the electricity production sector, the industry sector and the transport sector.

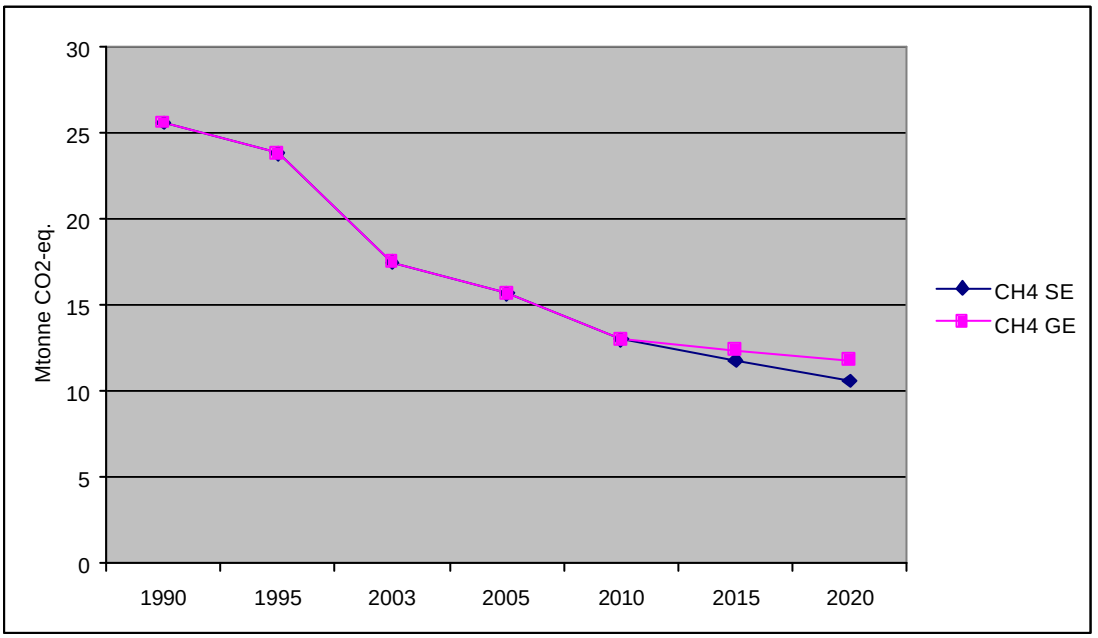
Figure 2-2: Actual and projected CO_2 emissions



CH_4 emissions

CH_4 emissons fall by about 20 to 25 per cent between 2003 and 2010 in both scenario's. This fall is due to a decline in the amount of offshore gas production (30 per cent fall between 2000 and 2010) and to measures taken to reduce emissions from gas production. The scenario's also reflect policies aimed at a reduction in the amount and a change in the composition of waste to be landfilled, which also contributes to the fall in CH_4 emissions. Both scenario's assume continuation of the milk quota and increased productivity until 2010, leading to a fall in numbers of dairy cattle and in CH_4 emissions. After 2010 the milk quota is repealed in both scenario's, but in GE there are greater opportunities for growth in the dairy cattle herd and enhanced productivity leading to greater manure production and higher emissions.

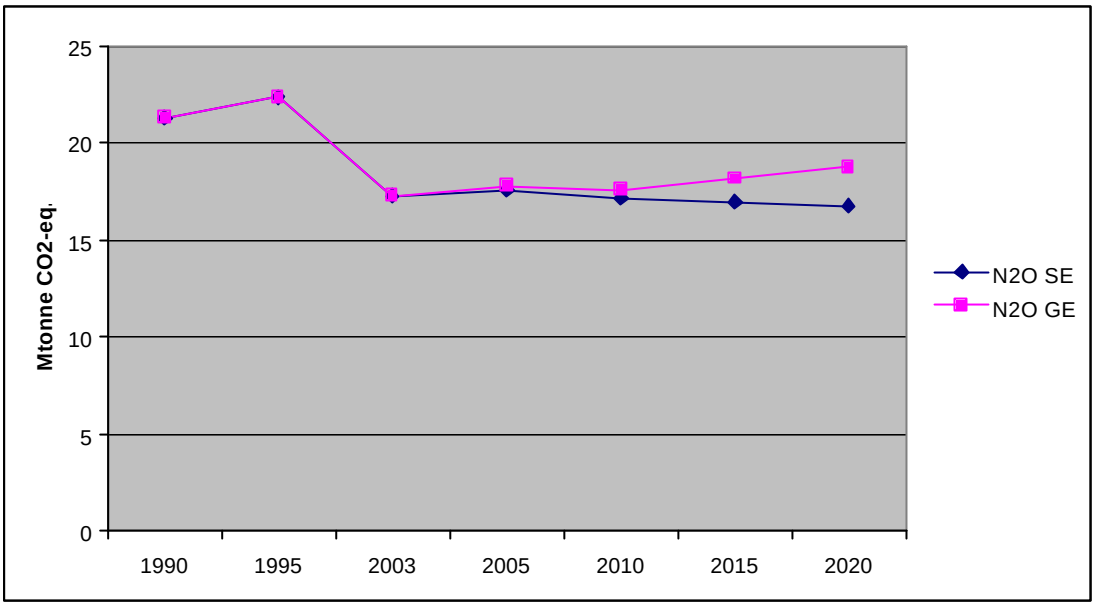
Figure 2-3: Actual and projected CH_4 emissions



N_2O emissions

N_2O emissions remain more or less constant until 2010 in both scenario's but rise again after 2010 in the GE scenario due to developments in the agricultural sector.

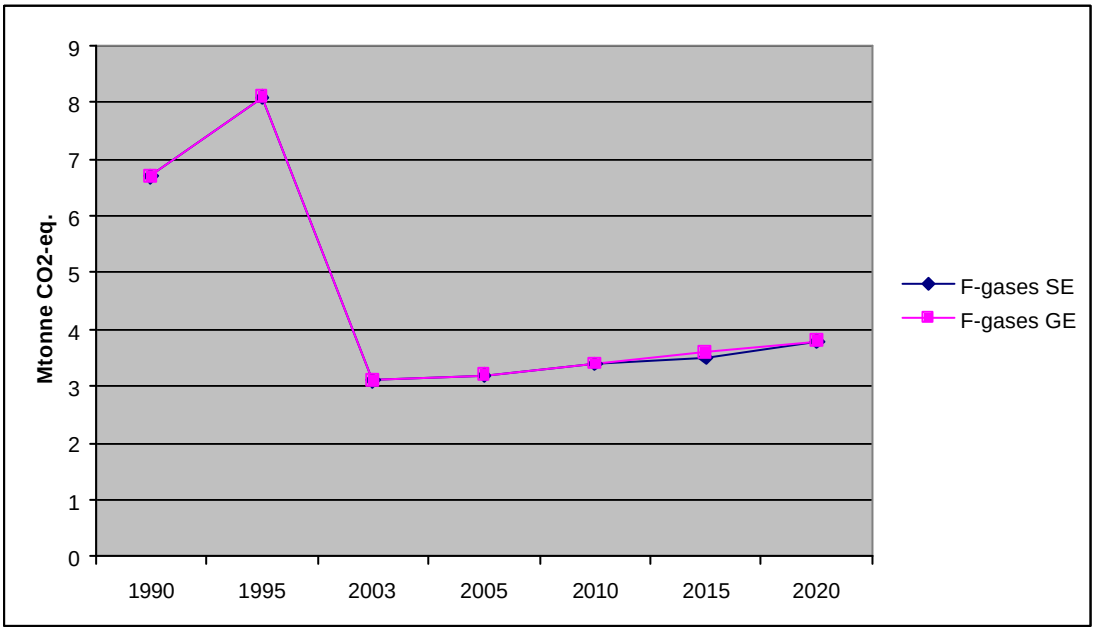
Figure 2-4: Actual and projected N_2O emissions



Emissions of the F-gases

Emissions of HFC's grow by about 20 percent between 2002 and 2010 in both scenario's, due partly to the transition from use of HCFC22 to HFC as a coolant and partly to growth in construction, where HFC's are used in hard foam insulation materials. PFC's decline by about half as result of measures taken in aluminium production pants and the ceiling on emissions in the semiconductor industry.

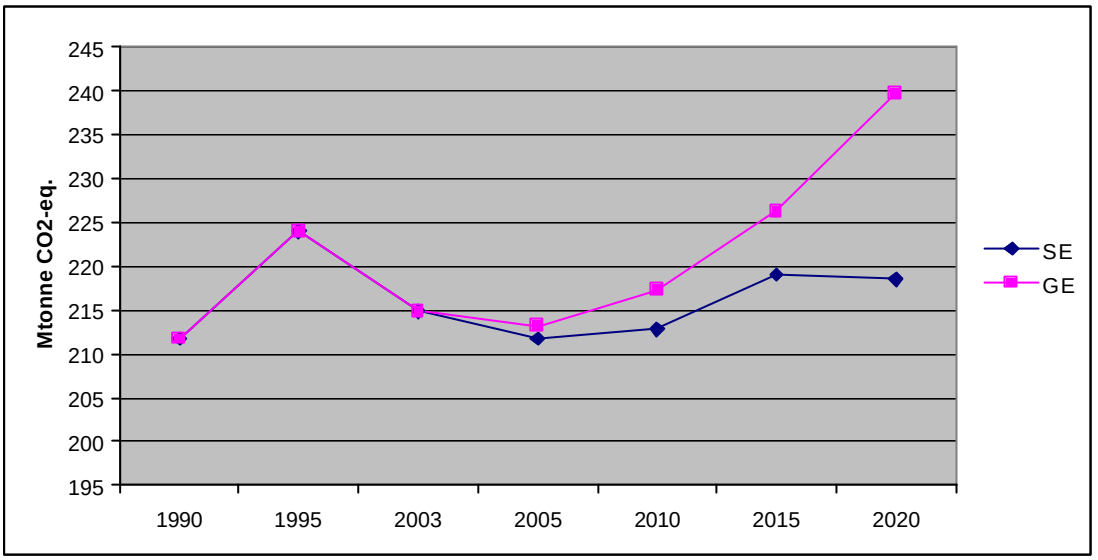
Figure 2-5: Actual and projected F-gas emissions



Total emissions of greenhouse gases
Total emissions of greenhouse gases are just about at their 2002 level in 2010 in the SE scenario (the fall in emissions of CH_4 is sufficient to compensate the growth in CO_2), while in the GE scenario total emissions grow by 2 to 3 per cent between 2002 and 2010. There is further growth in total emissions after 2010 in both scenario's.

The following figure show the projected developments in total emissions in the two scenario's relative to actual developments since 1990.

Figure 2-6: Actual and projected emissions of greenhouse gases (CO_2, CH_4, N_2O and f-gases)1990-2020



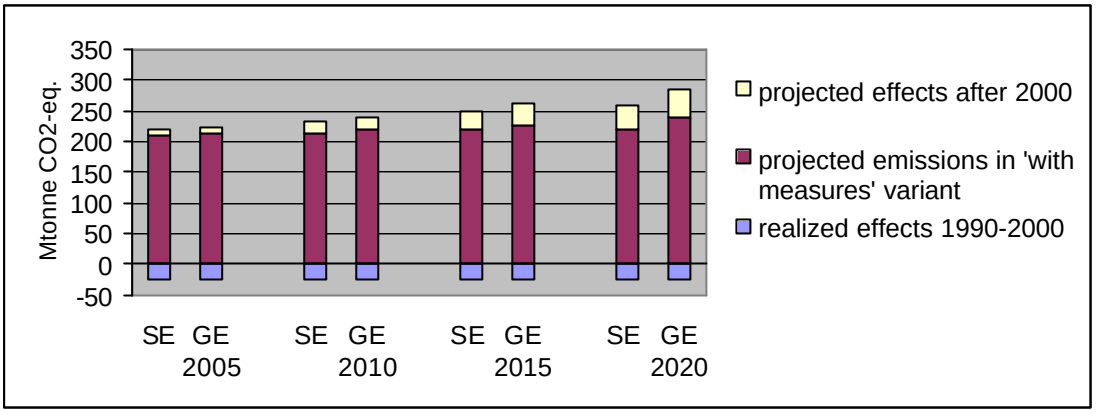
Total effect of policies
The total effect of current policies and measures has been determined by comparing the 'with measures' and 'without measures' variants as described above. The total impact of the policies in effect since 2000 is projected at 21 to 22 Mtonne in 2010, or about 10 per cent of projected emissions. Table 2-2 indicates that policies are especially effective in reducing emissions of the non CO_2-gases. However in the longer term the marginal effects of these policies decline, while the effects of policies aimed at reducing CO_2 increase. The total effect of the policies in effect since 2000 reaches a level of around 40 to 45 Mtonne in 2020, about 20 per cent of projected emissions.

Table 2-3: Projected effect of policies in force since 2000 on national emissions of greenhouse gases, in Mtonne avoided emissions per year

	SE scenario				*GE scenario*			
	2005	***2010***	***2015***	***2020***	***2005***	***2010***	***2015***	***2020***
CO_2	5	12	22	29	5	13	26	35
Non-CO_2	7	9	10	10	7	9	10	10
Total	12	21	32	39	12	22	36	45

The following figure shows the projected effects in the two scenario's relative to the projected emissions and the realized effects in the year 2000, estimated in [*Jeeninga, 2002*] at 26 Mtonne CO_2-equivalents. These 26 Mtonne are already included in the baseline of both the 'with measures' and 'without measures' variants. This means that emissions in 2000, the starting point for both variants, would have been 26 Mtonne higher had these policies not been pursued in the years 1990-2000.

Figure 2-7: Impacts of policy measures on emissions, in Mtonne avoided CO_2-equivalents



Effect of additional measures

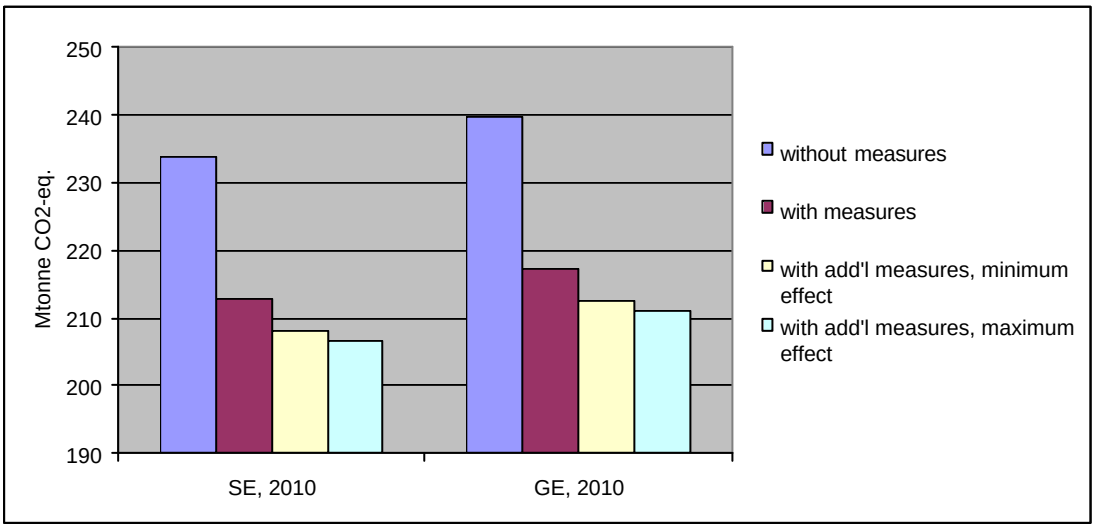
The total effect of the extra policies analyzed in the 'with additional measures' variant is estimated at a maximum of 6.3 Mtonne avoided CO_2-equivalent emissions in 2010. The following table indicates the estimated impact of each measure in 2010.

Table 2-4: Effect of additional measures in Mtonne avoided CO_2-equivalent emissions in 2010

Policy	***effect in Mtonnes CO_2-eq.***
CO_2 tender scheme for buildings	0-0.7
CO_2 differentiation in purchase tax on new cars; purchase tax exemption for hybrid cars	PM (no estimate available)
kilometer charge	0 – 0.9
biofuels policies, assuming a target of 2 per cent in 2006	ca. 0.7 [1]
technical measures at nitric acid production plants	ca. 4
EU F-gases regulation	no effect in 2010

[1] If achieved, the 2 per cent target would reduce emissions by about 0.7 Mtonne CO_2 in 2010. However, this estimate is not well-to-wheel. This means it does not reflect possibly higher emissions in the agricultural sector from raising crops to be used in the manufacture of biofuels.

Figure 2-8: Emission projections 'without measures', 'with measures' and 'with additional measures' in 2010



Emissions of NO_x, NMVOC and SO_2

[*Dril et.al.,2005*] also provides projections of emissions of NO_x, NMVOC and SO_2 for the SE and GE scenario's.[4] The projections reflect the impact of continuing the policies currently in force in the Netherlands.

Table 2-5 : Estimated emissions of NO_x, NMVOC and SO_2 in ktonne

gas	*1990**	*2002**	*2010*		*2020*	
			SE	*GE*	*SE*	*GE*
NO_x	598	415	284	288	262	272
NMVOC	488	233	173	176	171	182
SO_2	200	79	66	66	64	80

*Source: National Institute of Public Health and Environment (2004): *Milieubalans 2004*. Bilthoven 2004.

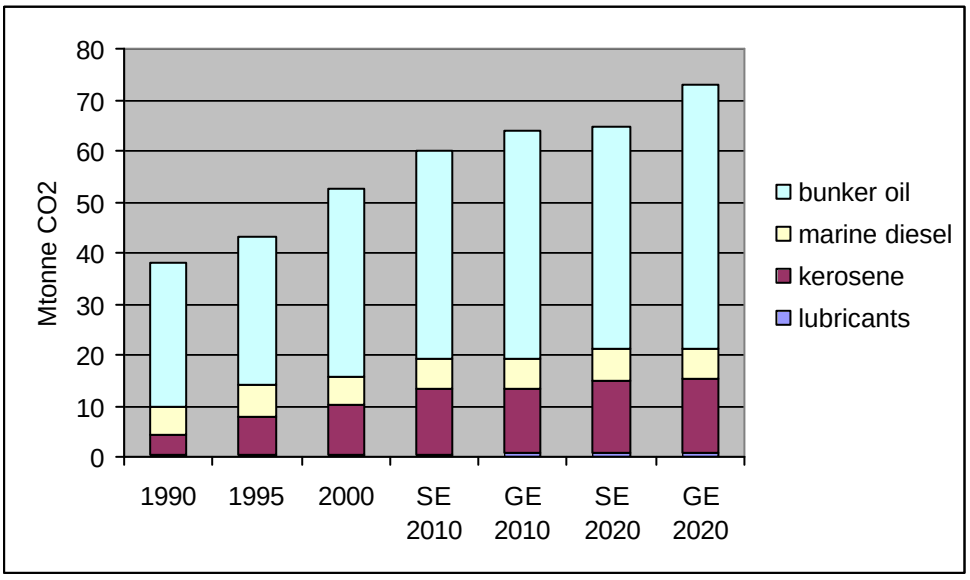
2.5 International bunkers

[*Dril et.al.,2005*] also provides an estimate of the bunkering of oil products in the Netherlands based on historical data and scenario characteristics in order to project emissions from the Dutch refinery sector. Projections of emissions due to international bunkering in the Netherlands are presented in Annex 8.

Rotterdam harbor plays an important role in fueling the worldwide maritime fleet. Bunkering of heavy oil (bunker oil) for sea-going vessels depends strongly on prices in the Dutch harbor and has little to do with the Netherlands' transportation sector. Heavy oil is also exported to the Netherlands from other countries to be sold here.

The demand for kerosene is tied more clearly to developments around Schiphol Amsterdam Airport, particularly as regards the flights being made by aircraft which are leaving the Netherlands. In the absence of data from the Netherlands which take account of the stabilization between 2000 and 2003, data from international studies have also been used in making the projections. No distinction is made between the SE and GE scenario's.

Figure 2-9: CO_2 emissions from international bunkering in the Netherlands



[4] Except for transport sector, which are based on [*Brink, 2003*].

The uncertainties connected with the projections of bunker emissions are quite large. If the market situation improves for competitors of Rotterdam harbor, then sales could stabilize at their 2000 level. Experience in recent years has also made clear that the growth in aviation bunkering can be significantly disturbed by unexpected developments. The most important uncertainty is the growth factor.

2.6 Sensitivity analysis and uncertainty

[*Dril et.al.*, *2005]* follows two approaches for getting a handle on the uncertainties associated with the projections. First, working with two scenario's provides insight into how fundamentally different developments in socio-economic parameters such as internationalization and public responsibility influence emissions and policy effectiveness. And second, bottom-up analyses of uncertainties in energy market developments and structural physical and technological developments on a sector by sector basis provide information about the impacts of those uncertainties on emissions.

The purpose of the uncertainty analysis is threefold:

1. to provide insight into uncertainty regarding realization of policy goals in 2010;
2. to provide insight into how the different sources of uncertainty contribute to the overall uncertainty of the projections;
3. to provide information that can help in developing robust strategies which limit the uncertainties surrounding policy results.

Four different sources of uncertainty have been identified. First, uncertainties in monitoring and historic data carry through into projections. Examples of such uncertainties include incomplete or incorrect information regarding historic starting points or emission factors. These uncertainties are described in detail in the National Inventory Reports of the Netherlands. Second, simulation models themselves consist of simplifications which may not do justice to complex reality. Third, policies change over time under the influence of Euopean policies, political preferences and new information and may not be captured adequately in the analyses. And finally, there are uncertainties associated with future economic, social and technological developments which are the driving forces in the scenario's. These include in particular uncertainties relating to international energy price developments, growth in world trade, the behavior of actors in the market, technological developments and the effectiveness of policies. These are generally the uncertainties with the greatest impacts on the overall uncertainty margins.

Ranges

The inventory of uncertainties has been used to determine a range around the emissions projections in the SE scenario. The methodologies used are those applied in [*IPCC, 2000*]. Use of these methodologies results in a 95% confidence interval around the projections. Details about this approach and the results can be found in [*Gijsen and Seebregts, 2005*]. The uncertainty range around the estimate of CO_2 emissions in the SE scenario is $\pm$ 17 Mtonne ($\pm$10 per cent) in 2010. For the non-CO_2 gases the uncertainty range amounts to circa +7 – 12 Mtonne (+20 per cent, -35 per cent).

Results

Table 2-6 presents the factors with the greatest impact on the uncertainty ranges. The correlation indicates the extent to which the range in the uncertain factor contributes to the total range in the emissions projections.

Table 2-6: Most important uncertain factors in projections of greenhouse gas emissions

gas	*factor*	*correlation*
N_2O	measure at nitric acid plants [1]	0.40
N_2O	agricultural emissions monitoring (direct emissions)	0.37
CO_2	transport	0.36
CO_2	balance of transboundary electricity trade and price relative to other countries	0.19
CO_2	development of demand for heat/steam (CHP)	0.19
CO_2	final electricity demand	0.18
N_2O	fertilizer demand (industry)	0.15
F-gases	estimation uncertainty	0.15
CO_2	economic growth industry, siting choices, and distribution of growth across activities	0.13
CH_4	estimation uncertainty waste disposal companies	0.12
CH_4	waste disposal plants emissions monitoring	0.12
CO_2	lifestyle behavior of households	0.12

[1]This measure is not included in the 'with measures' policy variant . However, the uncertainty analysis takes account of a 50 per cent chance that the measure (with an emission reduction effect of 4 Mtonne CO_2-equivalent) is taken anyway. This is also the reason that the range around the estimate of the non-CO_2 gases is asymmetric.

2.7 Projecting the forest carbon balance for the Netherlands

This section presents the results of preliminary projections of the forest carbon balance in the Netherlands. The results need to be considered provisional, as the Netherlands is continuing to improve and refine the methodologies and data used for projecting the forest carbon balance. The results presented here are based on forest definitions and assumptions which are described further in Annex 3 on Mandatory Parameters. The results for the years 2005, 2010 and 2015 are presented in this section and in the summary tables in Annex 6.

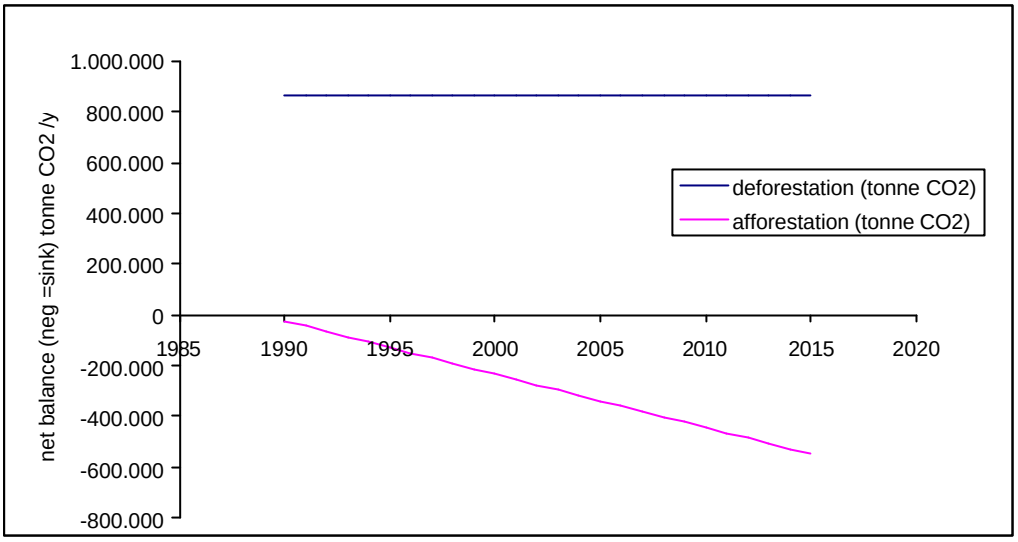
In 1990, the forest area covered 362,000 hectare in the Netherlands. According to an analysis of topographical land use maps the forest area amounted to 368,000 hectare in 2000. Approximately, 8 per cent of this is unmanaged. The map analysis showed that per year the Netherlands deforests 2500 hectare, and afforests 3120 hectare. This is a net afforestation of 620 hectare per year. Given the Dutch government's active policy to further expand this forest area, it has been assumed that the net expansion rate of 620 hectare per year will continue. It has also been assumed that the ratio of unmanaged forest will stay the same. The estimated effect of this net afforestation is presented in the following table.

Table 2-7: Annual net carbon emissions due to deforestation and afforestation

	2005	*2010*	*2015*
Mtonne CO_2	0.528	0.423	0.318

The carbon projection considers only the deforested and afforested area since 1990 (that is, existing forest is excluded). The analysis takes into account the full loss of biomass when a forest is deforested, and a slow regrowth rate when a new forest is established. It is assumed that no soil C changes take place due to afforestation or deforestation. The results are given in the following figure.

Figure 2-10: Projection of annual CO_2 sinks and sources due to afforestation and deforestation in the Netherlands.



Deforestation through settlement expansion, road building, urban sprawl etc. leads to an annual source of 865,000 tonnes of CO_2 per year. The afforestation effect (since 1990) is slow, as regrowth only starts to pick up some 5 years after planting. The sink through afforestation increases to 548,000 tonnes of CO_2 in 2015. The net effect over the period 1990-2015 is thus a source of 15.1 Mtonne CO_2.

3. Implementation of European legislation, institutional and legal arrangements

3.1 Implementation of Common and Coordinated Policies and Measures in the Netherlands

Annex 1 describes the linkages between national policies and measures and the Common and Coordinated Policies and Measures (CCPM's) of the European Union. Annex 9 provides an overview of how CCPM's have been implemented in the Netherlands as well as estimates of their expected effect on emissions to the extent possible. The CCPM's handled in Annex 9 are those included in the Commission's communication of 30 November 2004.

CCPM's have differing kinds of impacts in the Netherlands, which can be roughly divided among three main categories. Some CCPM's (such as the agreement with car manufacturers and the biofuels directive) reduce emissions beyond what is achieved by or possible with purely national policies. The second category contains CCPM's which do not lead to any additional emission reductions beyond those generated by national policies in the Netherlands, but do have other benefits which contribute to the effectiveness and efficiency of national policies. These benefits include:

- improving the 'level playing field' and addressing competitive distortions which might otherwise result from unilateral introduction of policies (such as the energy tax).
- facilitating national policies which lead to emission reductions (such as the energy labelling of appliances, which made possible the introduction in the Netherlands of the Energy Premium Rebate (EPR) scheme for energy efficient household appliances during the period 1999-2004).
- lowering the costs of achieving the same emission reductions which would otherwise have been achieved by purely national policies (such as CO_2 emissions trading).

The final category includes those CCPM's which have no impacts beyond national policies already in place before adoption of the CCPM.

3.2 Legal and institutional steps to prepare to implement commitments

National Climate Policy Implementation Plan

The National Climate Policy Implementation Plan (NCPIP, issued in two parts in 1999 and 2000) outlines how the Netherlands intends to meet its emission reduction commitments under the Kyoto Protocol. The Plan provides for evaluations of progress in 2002 and 2005 and a package of reserve measures to be implemented if the evaluations reveal a need for additional steps. The 2005 evaluation is currently underway and is expected to be published in September 2005. The NCPIP has been described extensively in previous submissions.

Ratification Kyoto Protocol

The Netherlands ratified the Kyoto Protocol on 31 May 2002.

Sectoral emission targets

A major change in the Netherlands' approach to its national climate change policy occurred in January 2004 with the adoption of target values for CO_2 emissions from four major sectors and for total emissions of the non-CO_2 gases in 2010. The sectors with a CO_2 target are energy and industry, agriculture, traffic and transport and households, trade and services (referred to in the Netherlands as the Buildings Sector). The combination of government purchases of emission reductions based

on the Kyoto mechanisms (described in Chapter 4) together with the target values for domestic sectors provides a system with clearly defined responsbilities for meeting the commitment to reduce emissions by 6 per cent in 2008-2012.

With the introduction of the CO_2 targets the Cabinet also agreed to a monitoring system, and to an approach to be followed if any of the sectors appears to be off track for meeting its target. The responsibilities of the Ministries of Environment, Economic Affairs, Agriculture and Transport, Public Works and Water Management for meeting the targets have become much more sharply delineated and defined. The object of this action was to reduce uncertainty regarding realisation of the Kyoto target. The target values and the departments bearing primary responsibility for meeting the targets are presented in the following table.

Table 3-1: Sectoral target values in 2010, in Mtonne CO_2-eq.

sector	***target value 2010***	***responsible departments***
CO_2		
➢ industry and energy	112	Economic Affairs
➢ agriculture	7	Agriculture, Nature and Food Safety
➢ traffic and transport	38[1]	Transport, Public Works and Water Management; Housing, Spatial Planning and Environment
➢ buildings	29	Housing, Spatial Planning and Environment
subtotal	*186*	
non-CO_2 gases	33	Housing, Spatial Planning and Environment
total	219	

[1]This target value was set without regard for the likely impact of implementation of the EU Biofuels Directive in the Netherlands. Once the modalities of implementation are known, the likely impact will be subtracted from this target value for the traffic and transport sector.

The departments are required to take the actions necessary to meet the target values. The basic principle of the target value approach is that departments themselves must initiate action if the target value for their sector seems in danger of being exceeded. This is a departure from the previous situation in the Netherlands because departments must now direct their efforts to achieving a certain emission level. In the past the objectives of the different policy instruments were generally expressed in terms other than CO_2, such as improvements in energy efficiency, renewable shares in total energy use, reduction in traffic congestion and so forth. This meant that it was possible for CO_2 emissions to continue increasing even when departments had achieved all their policy objectives.

The target value approach includes a monitoring system which is based on an annual assessment of progress. Emission levels for the sectors are determined based on a rolling three year average. Should the rolling average indicate growth that puts the target value at risk, it is up to the department responsible to develop proposals to remedy the situation.

The impact on the target values of definition and methodological changes made in the context of preparing the National System is being examined as part of the evaluation of climate change policy currently being carried out. The evaluation is also considering how to accomodate a larger share of the national emission space for the greenhouse horticultural sector (maximum 1.5 Mtonne extra) within the system of the target values, following discussion of the sectoral target values in Parliament. What impact these developments might have on the sectoral target values is as yet unknown. The results of the evaluation are expected to be reported to Parliament in the autumn of 2005.

National System for Monitoring Greenhouse Gases

The Netherlands has been working on the National System referred to in article 5 of the Kyoto Protocol since 2000. Methods for monitoring greenhouse gases and the process of data assembly for the annual National Inventory Reports have been described for this purpose. In the process of describing the current methods and processes, areas for improvement have been identified. This has led to several changes in methods as well as processes. The results of these activities have been laid down in Monitoring Protocols. The Monitoring Protocols, together with the QA/QC system, form the National System of the Netherlands. The Protocols will be pre-published on the internet-site www.greenhousegases.nl in April 2005, but will not have an official status until September 2005.

Act on Monitoring of Greenhouse Gases

An Act on Monitoring of Greenhouse Gases is currently being prepared and is expected to enter into force before September 2005. This Act determines that there shall be a National System for monitoring greenhouse gas emissions. The Minister of Housing, Spatial Planning and Environment will be empowered to appoint an authority responsible for the National System and the National Inventory. Furthermore, the Act determines that the National Inventory shall be based on monitoring protocols. Adjustments to the Protocols will require official publication of the new Protocols and an announcement of publication in the official Government Gazette (the Staatscourant).

National Inventory Entity (NIE)

The government agency SenterNovem has been appointed as National Inventory Entity by the Minister of Housing, Spatial Planning and Environment until mid-2006. SenterNovem has been responsible for building up the National System. The appointment of SenterNovem ensures continuity during the first period the system is operational. In 2006 an evaluation will take place and a new decision will be taken on the appointment of the NIE.

Netherlands' Emission Authority (NEA)

The Netherlands' Emission Authority was created and appointed official national registry for the purposes of the Kyoto Protocol and the EU Directive on CO_2 Emissions Trading by means of amendments to the Environmental Management Act (Staatsblad[5] 2004 511). The European Commission approved the register for CO_2 emissions trading in December 2004.

3.3 Arrangements for Compliance and Enforcement

Section 3.2 describes the system of evaluations, reserve measures and sectoral target values which the Netherlands has in place to ensure compliance with its emissions reduction target under the Kyoto Protocol. Besides these institutional arrangements made explicitly in response to the Netherlands' signing of the Kyoto Protocol, there are also more general legislative arrangements and enforcement and administrative procedures in place to ensure compliance with environmental rules and regulations. These arrangements pre-date the Netherlands' ratification of the Kyoto Protocol.

The Environmental Management Act provides the legal basis for most environmental regulations which affect emissions of greenhouse gases (for example, in the fields of waste prevention and landfill policy, environmental permits and CO_2 emissions

[5] The Staatsblad is the Official Government Bulletin of Acts, Orders and Decrees in the Netherlands.

trading) The Environmental Management Act also provides the framework for enforcing commitments undertaken in Long Term Agreements and the Benchmarking Covenant by companies that do not participate in emissions trading.

Chapter 18 of the Environmental Management Act contains the enforcement provisions. It notes, among other things, which authorities are responsible for enforcement and requires them to designate officials to be charged with monitoring compliance . Authorities have several possibilties for imposing sanctions if violations occur. They may, for example, order that the situation be brought into compliance at the expense of the violator or impose a pecuniary penalty or withdraw a license. The possibility of criminal sanctions also exists. Public prosecutors may bring cases against offenders in criminal court which can result in high financial penalties or even imprisonment (for a maximum of six years).

The statutory basis for the energy performance standards (EPN and EPC) which apply to new buildings is the Housing Act rather than the Environmental Management Act. The standards themselves are set down in a decree pursuant to this Act, the Buildings Decree. The Buildings Decree also empowers municipal authorities to grant building permits when the building design is judged to meet the standards in the Decree. Compliance and enforcement authority also rests with municipal authorities. If violations of the building permit occur, municipal authorities have recourse to administrative sanctions based on Article 25 of the Municipalities Act and to criminal sanctions based on Article 108 of the Housing Act.

The Freedom of Information Act and the Environmental Management Act also provide for public access to information regarding the enforcement of environmental rules and regulations, most recently through amendments contained in the Act concerning Implementation of the Arhaüs Treaty, which entered into force on 14 February 2005 (Staatsblad 2005, 519).

4. Participation in the mechanisms under Articles 6, 12 and 17

4.1 Institutional arrangements

Government use of the project-based mechanisms

The target for government use of the project-based mechanisms is 100 Mtonne CO_2-eq. over the commitment period 2008-2012 (an average of 20 Mtonne per year). The Clean Development Mechanism (CDM) is expected to provide about two thirds of the emission reductions, Joint Implementation (JI) the remaining third.

The Ministry of Housing, Spatial Planning and the Environment (VROM) was designated as National Authority (DNA) for CDM and JI in the Netherlands on 10 September 2002. The DNA approves CDM project proposals before submission to the CDM Executive Board. The selection of projects and the purchase of emission reductions from JI projects has been delegated by VROM to the Ministry of Economic Affairs, which acts as the Netherlands JI Focal Point. The Focal Point approves JI project proposals.

Clean Development Mechanism

Various types of instruments are being deployed by the government of the Netherlands in order to acquire Certified Emission Reductions (CER's). First, voluntary and not legally binding *Memoranda of Understanding* have been signed with various host countries to stimulate the implementation of CDM projects. A list of the countries with which such memoranda have been concluded, was provided to the Commission in the Questionnaire on the Use of Kyoto Protocol Mechanisms submitted on 20 January 2005. Second, *framework contracts* have been signed with multilateral and regional financial institutions (International Finance Bank (IFC), International Bank for Reconstruction and Development (IBRD), and Corporacion Andina de Fomento (CAF)) and a private bank (Rabobank) to act as intermediaries in acquiring CER's meeting certain price and quality specifications for the government. The Ministry of Environment is also participating in the *Community Development Carbon Fund* (CDCF). And lastly, CER's are acquired directly from projects through a public procurement tender procedure called *CERUPT*, which is administered by the government agency SenterNovem. In addition, the Ministry of Environment is in an advanced stage of negotiating a bilateral purchase agreement with a host country. It is expected that a contract will be signed later in 2005.

Joint Implementation

The Netherlands has developed three instruments for obtaining Emission Reduction Units. First, the *Emission Reduction Units Procurement Tender (ERUPT)* is a tender scheme with which the government acquires ERU's directly from projects via a public procurement process. The tender scheme is operated by the SenterNovem government agency. Second, the Ministry of Economic Affairs has signed a contract with the *Prototype Carbon Fund (PCF)*, by which the PCF endeavours to acquire cost-effective ERU's for the Netherlands in exchange for a contribution to the fund. And finally, *framework contracts* have been signed with the World Bank (a cooperative arrangement between the International Bank for Reconstruction and Development and the International Finance Bank) and the European Bank for Reconstruction and Development (EBRD). Under the terms of these contracts the banks endeavour to deliver ERU's at agreed upon prices and times.

Situation as of 1 January 2005

The following table shows the situation as regards each of the instruments on 1 January 2005. As the table shows, framework agreements with intermediary

organizations and projects selected via CERUPT and ERUPT account for 99 of the 100 Mtonne of ERU's and CER's which the government intends to purchase.

Table 4-1: Status of CDM and JI instruments as of 1 January 2005, Mtonne CER's and ERU's included in framework agreements with intermediary organizations

Instrument	*Clean Development Mechanism*		*Joint Implementation*	
	organization	*Mtonnes contracted*	*organization*	*Mtonnes contracted*
tenders	CERUPT	±2	ERUPT	15.5
contracts with multilateral financial institutions	IFC IBRD CAF	10 32 10	EBRD World Bank	6 10
contracts with private financial institutions	Rabobank	10	--	
participation in carbon funds	CDCF	±1	Prototype Carbon Fund	2.5

CDM and JI projects which have been contracted by the Netherlands are listed in the following table.

Table 4-2: Projects contracted by the Netherlands as of January 2005

name	*country*	*type of project*	*tonne emission reduction until end 2012*
CDM Projects			
Fortuna	Panama	hydro	196,000
Suzlon	India	wind	373,000
AyP	Bolivia	energy efficiency	296,000
AES S.A.	Panama	hydro	3,397,000
Inner Mongolia	China	wind	578,000
AES	Panama	hydro	330,000
INCSA	Costa Rica	energy efficiency	343,000
SARET	Costa Rica	landfill	663,000
Ind-Barath	India	biomass	231,000
Kalpa Taru	India	biomass	754,000
Onyx	Brazil	waste	487,000
Nova Gerar	Brazil	waste	2,500,000
JI Projects			
BioHeat International	Czech Republic	biomass	522,320
Hidroelectrica s.a.	Romania	hydro	1,673,844
Holcim s.a.	Romania	energy efficiency	800,00
BKB Waste Management	Slovakia	landfill gas recovery	551,023
AES Borsod	Hungary	biomass	713,488
Meridian	New Zealand	wind	530,000
Bakony Power Plant	Hungary	biomass	453,000
Hidroelectrica s.a.	Romania	hydro	267,000
Oü Paldiski Tuulepark	Estonia	wind	730,593
Overgas Inc. AD	Bulgaria	fuel switch	350,000
S.C.NUON Energy Romania	Romania	district heating	349,306
Arcadis Ekokonrem	Poland	landfill gas reduction	253,000
Biovet	Bulgaria	energy efficiency	307,000
BKB Waste Management	Romania	landfill gas reduction	475,644
Stadtwerke Herne	Germany	mine gas (CH_4) reduction	250,000
Plovdiv EAD	Bulgaria	district heating	533,176
Overgas Inc	Bulgaria	fuel switch	500,000
Füsföi	Hungary	biomass heat and power	350,000

Use of the project-based mechanisms by other legal entities

In a letter regarding implementation of Directive 2004/101/EC (the so-called Linking Directive) sent to Parliament in February 2005[6], the Dutch government announced its intention to allow companies participating in CO_2 emissions trading unlimited use of CER's during the period 2005-2007.

The government also proposed limiting the use of JI and CDM during the period 2008-2012 to 8 per cent of the allocated allowances. The proposed percentage is the same as the European Commission noted as an example in explaining its original draft of the proposed directive. It was proposed as a maximum for the European Community as a whole, and was presented as reflecting 2.7 per cent of base year emissions (1990) in the Community. This would in turn amount to one-third of the EU's emission reduction target of 8 per cent under the Kyoto Protocol. The European Commission considered this a good way of achieving the Community's overall supplementarity objective. The Netherlands supported the Commission in this proposal, but ultimately the discussions did not result in a maximum for the EU as a whole. Instead, each Member State must determine a maximum per installation. In choosing the same percentage per installation as was in the original Commission proposal the Dutch government is remaining consistent to its original position and hopes to be able to contribute to harmonization within Europe.

The Dutch government expects that more will be known about how other Member States are planning to limit the use of the project-based mechanisms in the second half of 2005. A level playing field for all European companies as regards access to JI and CDM is considered to be very important. The Dutch government therefore considers its proposal for a limit of 8 per cent as a contribution to the European discussion regarding supplementarity.

4.2 Financial arrangements

The government has reserved roughly € 606 million for acquisition of CER's and ERU's (€ 204 million for Joint Implementation and € 402 million for Clean Development Mechanism). The allocation of this budget thus far to the instruments described in section 4.1 has been reported to the Commission in the Questionnaire on the Use of Kyoto Protocol Mechanisms submitted by the Netherlands on 20 January 2005.

4.3 Decision making procedures

Decision making responsibility for CDM rests with the Ministry of Housing, Spatial Planning and Environment.

In general, each CDM project should serve all three CDM goals:

- to contribute to sustainable development in non-Annex I countries;
- to contribute to the ultimate objective of the United Nations Framework Convention on Climate Change: the absolute mitigation of climate change;
- to assist Annex I parties in complying with their emission reduction commitments.

All intermediary organisations are contractually obliged to select, contract and purchase emission reductions only from projects that comply with the Ministry's CDM project criteria, the CDM requirements as defined in the Kyoto Protocol, the Marrakech Accords, and the guidance provided by the CDM Executive Board, the approval criteria of the host country and the intermediary's own project selection criteria and environmental and social safeguard policies.

[6] available in Dutch at www.Parlement.nl as *Kamerstukken II 2004-2005, 28240, nr. 18*.

The minimum criteria applied to projects submitted in the framework of the Netherlands' CDM program are described in the box on page 45.

Decision making responsibility for JI rests with the Ministry of Economic Affairs. JI projects are eligible for selection if they comply with the requirements as defined in the Kyoto Protocol and the Marrakech Accords and, depending on the instrument used, if they comply with the Terms of Reference of ERUPT or the intermediary's (banks) own project selection criteria. In the absence of the authority of the Supervisory Committee so far, the guidance provided by the CDM Executive Board has been used in the criteria for selection by the various instruments.

The Kyoto Protocol (KP) defines a JI Project as a project that generates a reduction in emissions of greenhouse gases that is additional to any reduction that would otherwise occur, that is to say reductions that would not be achieved in the absence of the project. JI Projects can only be undertaken in Annex I countries as listed in the Framework Convention on Climate Change.

Examples of JI Projects are:
- Renewable energy (e.g. solar, wind, biomass, hydro)
- The replacement of CO_2-intensive fuels (e.g. oil to gas, coal to gas)
- Energy efficiency (e.g. CHP, lighting, insulation, process optimisation)
- Waste processing (e.g. landfill gas extraction, waste incineration)

Criteria for successful JI projects are described in the box on page 46.

CDM Project Criteria

- Consistency with UNFCCC, the Kyoto Protocol, the Marrakech Accords and the guidance provided by the CDM Executive Board.
- Projects should comply with all current decisions on modalities and procedures adopted by Parties to the UNFCCC and/or the Kyoto Protocol, as well as all future decisions on modalities and procedures, when adopted.
- Consistency with Relevant National Criteria.
  Project designs should be compatible with and supportive of the national environmental and development priorities of the Host Countries. In addition, the Projects and the transfer of Emission Reductions and the request for Issuance of CERs should be consistent with the rules and criteria adopted by Host Countries regarding CDM projects.
- Consistency with General Guidance Provided by VROM.
  The contracted intermediairies shall seek to ensure that Projects comply with the general guidance provided by VROM at the regular meetings between VROM and the intermediairy (which usually concerns new decisions by the CDM Executive board or new guidance based on other policies of the Dutch government).
- Location of Projects.
  Projects shall be located in countries not listed in Annex I to the UNFCCC which have (i) signed and ratified, accepted, approved or acceeded the Kyoto Protocol, or (ii) signed the Kyoto Protocol and demonstrated a clear interest in becoming a party thereto in due time.
- Nuclear energy projects are not eligible.
- LULUCF. The Netherlands may implement 1% of its assigned amount by means of projects involving land-use or land-use change (afforestation, reforestation). This equals 11 Mtonne CO_2 equivalents up to the end of the Kyoto first commitment period (2012).
- Environmental and Social Impacts.
  Projects that are expected to have large scale adverse social or environmental effects are not eligible
- Cost Effectiveness and Sustainability.
  Cost Effectiveness and Sustainability will play a major role in selection and approval of Projects. Projects may be drawn from a broad range of technologies and processes in energy, industry and transport, which provide various vehicles for generationg Emission Reductions, which contribute to sustainable development, the ultimate objective of UNFCCC and achieve transfer of cleaner and more efficient technology to Host Countries. VROM ranks technologies in the following descending order: (i) renewable energy technology, such as geothermal, wind, solar and small scale hydro-power; (ii) clean sustainable grown biomass (no waste); (iii) energy efficiency improvement; (iv) transportation improvements; (v) fossil fuel switch and methane recovery; (vi) sequestration. VROM expects this ranking to be reflected in the agreed Emission Reduction Unit Price (higher price for CERs from more sustainable projects).
- Projects should be structured to mitigate various types of risks.
  Projects should generally entail manageable technological risk. The technology to be used in a Project should be commercially available, have been demonstrated in a commercial context, and be subject to customary commercial performance guarantees. The technical competence in the Host Country to manage this technology should be established in the course of project appraisal. Projected Emission Reductions over the life of the project should be predictable and should involve an acceptable level of uncertainty.
- Hydropwer projects
  The recommendations of the World Commission on Dams should be taken into account for hydropower projects.

Criteria for successful JI projects

- The feasibility study of the project has been accomplished and a solid business plan has been developed. The project shows progress in the development stage and a clear project design is available. SenterNovem prefers projects which can be realised within six months after contracting.
- The Host Country approves the project as a JI project by issuing a Letter of Approval. Contact with the focal point of the Host Country should be established at an early stage.
- The financing of the project is solid and near to closure and the supplier (or its guarantor) has a sufficient financial and economic standing.
- The project team is experienced in developing and operating similar projects and has experience in the carbon business as well. Companies that are not experienced in methodologies to calculate and monitor emission reductions can hire a consultant which has done the job before. Selling Emission Reductions is a whole new commodity to most companies and companies should definitely gain a (thorough) understanding of what it is they are selling;
- A solid Project Design Document (PDD) is made by the supplier (or his consultant) and validated by a validator. This step is required under the Marrakech Accords and proofs that the calculations of the emission reductions are executed according to the available guidelines or methodologies.

Further requirements

- The Host Country should have ratified the Kyoto Protocol. In case the Host Country has not ratified the Kyoto Protocol, SenterNovem will assess whether it is likely that the Host Country will ratify in the near future. Otherwise the project will be rejected in the contract awarding phase.
- Projects that started construction before 1 January 2000 are not eligible.
- Projects in the field of nuclear energy are not eligible.
- Forest management projects are not eligible. Other Land-use, Land-use Change and Forestry project remain eligible.
- Projects that are participating in another Dutch JI program are not eligible. This includes multilateral programs in which the Netherlands participates.
- Projects expected to have large scale adverse effects on society or biodiversity (e.g. large scale hydropower dams) and/or projects which might sooner or later result in social or political agitation are not eligible;

In case SenterNovem doubts the results of the Environmental Analysis and/or the Environmental Impact Assessment carried out, SenterNovem may require an EIA in accordance with European quality standards.

Annex 1
Summary Table: Policies and Measures in the Netherlands

cluster	*GHG affected*	*Name of policy measure*	*objective and/or activity affected*	*type of instrument*	*status*	*implementing entity*	*estimate of mitigation impact per year, in Mtonne CO_2-eq.*			*link with CCPM*
							2005	*2010*	*2015*	
Energy sector										
Combined heat and power (CHP)	CO_2	1. MAP 2. BSET 3. NEWS 4. EIA 5. Vamil 6. special gas price 7. energy tax exemptions 8. MEP	encourage construction and use of CHP by lowering investment costs [1-5] and operating costs [6-8]	1-8. economic	1. disc. 2. disc. 3. disc. 4. impl. 5. disc. 6. disc. 7. disc. 8. impl.	1-8. national government	1.0	1.9	1.6	All policies pre-date adoption of EU Directive on Combined Heat and Power
Renewable energy	CO_2	1. Coal Covenant 2. BLOW Covenant 3. EIA 4. Vamil 5. energy tax exemptions 6. MEP	5% renewable energy in 2010; 10% in 2020; 9% renewable electricity in 2010	1-2. negotiated agreement 3-6. economic	1. impl. 2. impl. 3. impl. 4. disc. 5. disc. 6. impl.	1. national government and coal-fired power plants 2. national and provincial governments 3-6: national government	1.5	4.2	9.4	EIA, Vamil and energy tax exemptions pre-date adoption of EU Directive on Renewable Electricity
Energy Efficient Power Generation	CO_2	Benchmark Covenant	participating companies become among the most energy efficient in the world by 2012	negotiated agreement	impl.	national government, provincial governments, firms from energy and industry sectors	0	0	0	No link.
CO_2 emissions trading	CO_2	CO_2 emissions trading scheme	reduce CO_2 emissions from large energy-intensive companies in most cost-effective way	other	impl.	national government	0.3	1.1	3.6	Introduced to implement EU Directive on Emissions Trading
Low methane oil and gas production and distribution	CH_4	Environmental covenant with oil and gas sector	reduce CH_4 emissions from oil and gas production by 10% in 2000 relative to 1990	negotiated agreement	impl.	national government	0.3	0.3	0.3	No link.

cluster	*GHG affected*	*Name of policy measure*	*objective and/or activity affected*	*type of instrument*	*status*	*implementing entity*	*estimate of mitigation impact per year, in Mtonne CO_2-eq.*			*link with CCPM*
							2005	*2010*	*2015*	
Industry sector										
Energy Efficiency	CO_2	1. LTA's 2. Benchmark Covenant 3. Environmental permit 4. EIA 5. Vamil	to promote energy conservation and efficient use of energy	1-2. negotiated agreement 3. regulation 4-5. economic	1-5. impl.	1-5. national government	0.9	1.4	2.1	No link.
CO_2 emissions trading	CO_2	CO_2 emissions trading scheme	cost optimization of CO_2 reduction efforts	other	impl.	national government	0	0.3	0.5	Introduced to implement EU Directive on Emissions Trading
Low HFC HCFC production	HFC	Afterburner HCFC production	reduction in emissions of HFC's	regulation (environmental permit)	impl.	provincial government	1.9	1.9	1.9	No link.
Low PFC aluminium production	PFC	1. Environmental Covenant 2. Environmental permit 3. CO_2 Reduction Program/general 4. Non-CO_2 Reduction Program	reduction in emissions of PFC's	1. negotiated agreement 2. regulation 3-4. economic	impl.	1,3,4. national government 2. provincial government	1.1	1.1	1.1	No link.
Low N_2O nitric acid production	N_2O	Catalytic reduction nitric acid production	reduction in emissions of N_2O	still under development	pln.	not yet determined	--	--	--	No link.
Reduction Program Non-CO_2 Gases	HFC/PFC	F-gas reduction foams, spray cans, stationary cooling, incl. emission ceiling semiconductor industry	reduction in F-gas emissions from products and semiconductor industry	regulations and agreements	impl.	national government	0.5	1.0	1.0	No link.
Transport sector										
Fuel efficiency through technical vehicle measures	CO_2	1. energy labelling cars 2. tax rebate efficient cars 3. ACEA agreement 4. CO_2 Reduction Program/freight transport 5. Quieter, Cleaner, More Fuel Efficient Program	increasing fuel efficiency and reducing CO_2 emissions through technical vehicle measures	1. information 2. fiscal 3. negotiated agreement 4. economic and information 5. economic	1.impl. 2.disc. 3--- 4.impl. 5. impl.	1,2. national government 3. European Commission 4,5. national government, Senter/Novem	0.2	0.4	0.4	ACEA agreement requires no implementa-tion in the Netherlands; energy labelling of vehicles introduced to implement Directive 1999/94/EC

cluster	*GHG affected*	*Name of policy measure*	*objective and/or activity affected*	*type of instrument*	*status*	*implementing entity*	*estimate of mitigation impact per year, in Mtonne CO_2-eq.*			*link with CCPM*
							2005	*2010*	*2015*	
Fuel efficiency through driving behaviour and discouraging vehicle use	CO_2	1. KZRZ, The New Driving Force 2. stepped up enforcement of speed limits 3. in-car equipment 4. REV,EBIT 5. Transactie 6. Ketenmobiliteit 7. Transportpreventie 8. Kilometer Charge	1-3. increasing fuel efficiency and reducing CO_2 emissions through optimization of driving behavior 4-7.discourage vehicle use through logistical improvements 8. reduce congestion	1. information/education 2.regulation 3.fiscal 4-7. information/education and economic (subsidy) 8. economic (users charge)	1. impl. 2. impl. 3. disc. 4-7. impl. 8.pln.	1. national government, SenterNovem 2-8. national government	0.5	0.9	0.9	No link.
Other	CO_2	1. Excise duties 2. CO_2 Reduction Program/Passenger Transport 3. EU Biofuels Directive	1.raise revenue 2. reduce CO_2 emissions through investments in material 3. target: 2%	1. fiscal 2. economic 3. diverse	1. impl. 2. impl. 3. pln.	1,3. national government 2. national government and SenterNovem	0.1	0.1	0.1	EU Biofuels Directive still to be implemented.
Agriculture Sector										
Energy savings in greenhouse horticulture	CO_2	1. Glami 2. Greenhouse Horticulture Orders in Council	1. increase energy effiiciency by 65% 1980-2010	1.negotiated agreement 2. regulation	1.impl. 2.impl.	1.national government and greenhouse horticulture sector 2. national government	0.2	0.4	0.8	No link.
Livestock Reduction	CH_4	Milk quota	--	--	--	--	0.1	0.3	0.15	
Manure Management	CH_4, N_2O	1. manure application norms 2. nitrogen norms	reduce nitrates in soil and emissions of NH_3	1-2. regulations	1-2.impl.	1-2. national government	0.4	0.6	0.3	
Forestry Sector										
Afforestation	CO_2	1. National Ecological Network 2. Day recreation facilities in urban areas	1.conservation, restoration, development and sustainable use of nature to aid biodiveristy 2. realisation of recreation areas	1,2.other	1,2. Impl.	1. provincial governments 2. major cities and provincial governments	--	--	--	No link.

cluster	*GHG affected*	*Name of policy measure*	*objective and/or activity affected*	*type of instrument*	*status*	*implementing entity*	*estimate of mitigation impact per year, in Mtonne CO_2-eq.*			*link with CCPM*
							2005	*2010*	*2015*	
			in the urban environment to counter continuing shortage of day recreational facilities							
Waste Sector										
Landfill Policy	CH_4	1. Decree on Soil Protection from Landfills 2. Decree on Waste landfills and Waste Landfill Bans 3. Landfilling Tax		1-2. regulations 3. fiscal	1-3. impl.	1-3. national government	3.0	4.0	5.0	Regulations pre-date adoption of Directive 1999/31/EC but were amended in order to implement the directve.
Buildings Sector										
Energy performance new buildings	CO_2	1. Energy Performance Norm 2. Energy Performance Coefficient 3. Energy Tax	improve energy performance of new residential and non-residential buildings	1.regulation 2. regulation 3. fiscal	1. impl. 2. impl. 3. impl.	1-3. national government	0.3	1.1	2.2	EPC and EPN pre-date adoption of Directive 2002/91/EC (Energy Performance of Buildings) but will be modified in order to implement the directive. The energy tax pre-dates adoption of Directive 2003/96/EC but was modified in order to implement the directive.
Retrofit existing buildings	CO_2	1. EPA 2. EPR	improve energy performance of	1. information 2. economic	1. impl. 2. disc.	1-5. national government				ibid.

cluster	*GHG affected*	*Name of policy measure*	*objective and/or activity affected*	*type of instrument*	*status*	*implementing entity*	*estimate of mitigation impact per year, in Mtonne CO_2-eq.*			*link with CCPM*
							2005	*2010*	*2015*	
		3. CO_2 Tender Scheme for Buildings 4. Energy Tax 5. EINP	existing residential and non-residential buildings	3. economic 4. fiscal 5. economic	3. pln. 4. impl. 5. disc.		0.5	1.0	1.5	
Energy efficiency appliances	CO_2	1.Energy Labelling Appliances 2. Energy Pemium Rebate appliances	improve market penetration of energy efficient appliances	1. information 2. economic	1. impl. 2. disc.	1-2. national government	0.3	0.6	0.8	Energy labelling introduced to implement various EU directives pertaining to labelling of appliances.
Total							13.0	22.5	33.6	

Definitions used in summary table are taken from UNFCCC guidelines for National Communications (FCCC/CP/1999/7).

type of instrument:
economic, fiscal, negotaited agreement, regulatory, information, education, research, other

status:
pln = planning = the measure is in the planning stage, that is, either political interest in measure has been expressed and modalities are being worked on or measure is in preliminary study phase. This does not necessarily imply that a decision has been taken to implement the measure.
adop = adopted = measure has been proposed and accepted but is not yet in effect.
impl = implemented = measure is in effect.
disc = measure was previously in effect but is no longer in force as of 1 January 2005 due to its having expired or been repealed. The effects of discontinued measures may continue to be felt into the future. Where this is the case, the table reflects these effects.

abbreviations:
ACEA – refers to agreements with European, Japanese and Korean car makers
EBIT – Energy Savings in Transport
EIA - Energy Investement Tax Deduction
EINP – Energy Investment Subsidy Program for Non-profit Organizations
EPA – Energy Performance Advice
EPR – Energy Premium Rebate
KZRZ – Koop Zuinig! Rij Zuinig! (Buy Fuel Efficient! Drive Fuel Efficient)
LTA's – Long Term Agreements
REV – Rational Energy Use in Traffic and Transport
VAMIL – Variable Depreciation of Energy Investments

Annex 2
Policies which have expired or been repealed since previous report to European Commission

The Energy Premium Rebate (EPR) has been discontinued; if needed, it may be (partly) replaced with a CO_2 Tender Scheme in the Buildings Sector.

Article 36i of the Energy Tax, which allowed for a reduced tax rate on green electricity, was eliminated as of 1 January 2005.

The budget of the Energy Investment Tax Deduction (EIA) was cut by € 100 mln in 2005.

As part of the introduction of CO_2 emissions trading pursuant to Directive 2003/87/EC, the Environmental Management Act was amended to eliminate energy requirements in environmental permits for installations falling under the trading system.

A payment discount in the Energy Tax intended to accelerate afforestation was dropped in the 2003 Tax Plan.

A reduction in the purchase tax on new cars for in-car instruments was repealed in 2005.

Annex 3
Mandatory parameters on projections pursuant to Annex IV, Implementing Provisions

General Economic Parameters

parameter	*value in 2000*	*annual growth in %/yr 2002-2010*		*annual growth in %/yr 2011-2020*	
		SE	***GE***	***SE***	***GE***
GDP, in million euro's	402 291	1.8	2.9	1.8	2.9
		value in 2010		***value in 2020***	
Population, in millions	15.9	16.8	16.8	17.6	17.9
international coal price, in €/GJ	1.50	1.70	1.70	1.70	1.70
international oil price, in €/GJ	5.36	4.41	4.41	4.72	4.72
international gas price, in €/GJ	3.06	2.89	2.89	3.39	3.39

Prices are in real euro's at 2000 level

Assumptions regarding weather parameters

	2000	***2005***	***2010***	***2015***	***2020***
heating degree days	2695	2846	2773	2700	2628
cooling degree days	56	98	112	127	144

Assumptions for energy intensive industries

industrial subsector	*parameter*	*value in 2000*	*annual growth in %/yr 2000-2010*		*annual growth in %/yr 2011-2020*	
			SE	***GE***	***SE***	***GE***
dairy	tonnes milk	10.89	-0.7	-0.	-0.7	-0.7
paper manufacturing	mln tonnes paper	3.29	1.6	1.7	1.3	1.1
inorganic basic chemicals	mln tonnes C12	0.80	0.9	1.1	2.0	2.2
fertilizer	mln tonnes NH_3	2.26	0.9	0.9	1.3	1.5
bricks	mln WF bricks	1559	0.6	0.8	1.3	1.7
cement	mln tonnes cement production	3.42	-0.3	-0.1	0.7	0.9
cement	mln tonnes clinker production	0.64	-100.0	-100.0	-	-
ferro	mln tonnes primary steel production	*	3.4	3.4	1.0	1.0
ferro	mln tonnes secondary steel production	0.16	2.8	-2.8	1.0	1.0
primary aluminium	tonnes Al	0.30	0.2	0.2	0.5	0.5
secundary aluminium	tonnes Al	0.086	1.7	1.7	2.0	2.0
petrochemicals and aromatics	tonnes	unknown	3.5	3.6	2.1	2.3

* confidential, range = 5-6

Assumptions for manufacturing industries and other sectors

(sub)sector	*value of production in 2000 in mln euro's*	*annual growth in %/yr 2000-2010*		*annual growth in %/yr 2011-2020*	
		SE	*GE*	*SE*	*GE*
agriculture and fisheries	21 863	0.7	0.2	0.8	1.3
foodstuffs and luxury items	43 821	1.3	1.7	2.3	3.6
chemicals, rubber and plastics	40 365	2.2	3.3	3.9	3.4
metal	68 674	-0.3	1.6	0.0	1.7
petroleum	17 530	1.0	1.4	2.9	4.1
minerals production	12 292	-1.5	-4.8	-2.0	-4.1
public utilities	18 249	1.9	0.7	3.5	0.5
construction and installation	60 244	1.3	0.7	2.9	2.6
real estate rental and trade	37 716	1.3	1.3	1.3	1.6
trade and repair	82 537	2.0	2.4	3.3	3.8
transport and storage	37 768	2.1	2.7	4.1	4.6
banking and insurance	39 751	1.6	2.0	2.6	2.9
remainder tertiary	109 465	1.6	1.9	2.4	2.6

Assumptions for transport sector: macroeconomic models

parameter	*1996-2000*	*2001-2005*		*2006-2010*		*2011-2015*		*2016-2020*	
		SE	*GE*	*SE*	*GE*	*SE*	*GE*	*SE*	*GE*
growth of transport relative to GDP	4.0%	2.6%	1.5%	5.6%	2.7%	4.6%	2.7%	4.6%	2.7%

Assumptions for transport sector: other models

parameter	*2005*		*2010*		*2015*		*2020*	
	SE	*GE*	*SE*	*GE*	*SE*	*GE*	*SE*	*GE*
car kilometers	99 966	99 966	110 832	110 832	118 492	118 492	126 152	126 152
truck kilometers	8118	8118	9412	9412	11 681	11 681	13 950	13 950

Assumptions for buildings

parameter	*value in 2000*	*annual growth, in %/yr 2000-2010*		*annual growth, in %/yr 2011-2020*	
		SE	*GE*	*SE*	*GE*
floor space tertiary buildings, in mln m^2	186.6	0	1.0	1.0	1.0
floor space residences, in mln m^2	416.2	1.0	1.0	2.0	2.0
number of dwellings, in thousands	6589.6	1.0	1.0	1.0	1.0
number of employees in tertiary sector, MFTE	4.7	1.0	1.0	1.0	1.0

Assumptions for energy sector

parameter	***2000***	***2010***		***2020***	
		SE	***GE***	***SE***	***GE***
total gross inland consumption in PJ	*3 147*	*3 844*	*5 114*	*3 463*	*3 692*
• oil	1 042	1 257	1270	1 456	1 524
• coal	321	390	389	322	477
• gas	1 548	1 465	1 532	1 546	1 542
• renewable	69	556	56	27	12
• nuclear	39	39	39	0	39
• other*	131	137	137	112	98
total electricity production in MWh	*87 139*	*106 722*	*114 166*	*131 028*	*153 723*
• oil	3 944	3 778	3694	1 000	2 806
• coal	23 167	26 583	26472	18 361	35 972
• gas	52 250	59 944	66 278	87 444	72 528
• renewables	1 806	9 639	10 944	21 167	35 639
• nuclear	3 722	3 722	3722	0	3 722
• other*	2 250	3 056	3056	3 056	3 056
energy demand energy industries in PJ	*542*	*632*	*646*	*638*	*754*
• oil	133	139	143	137	177
• coal	245	285	283	204	358
• gas	288	327	350	471	330
• electricity	-189	-241	-255	-308	-359
• other*	65	122	125	134	248
energy demand industry in PJ	*1 125*	*1 286*	*1 297*	*1 398*	*1 462*
• oil	393	557	563	648	666
• coal	75	106	106	118	118
• gas	560	526	531	534	582
• electricity	70	63	62	65	62
• other*	27	34	35	33	34
energy demand tertiary sector in PJ	*525*	*509*	*547*	*491*	*576*
• oil	54	58	62	63	72
• coal	0	0	0	0	0
• gas	350	301	328	257	315
• electricity	104	131	137	151	169
• other*	17	19	20	20	20
energy demand households in PJ	*445*	*427*	*448*	*416*	*470*
• oil	4	4	4	4	4
• coal	0	0	0	0	0
• gas	349	311	324	283	315
• electricity	78	98	105	114	134
• other*	14	14	15	15	17
energy demand transport sector in PJ	*465*	*505*	*505*	*611*	*611*
• oil	459	499	499	605	605
• coal	0	0	0	0	0
• gas	0	0	0	0	0
• electricity	6	6	6	6	6
• other*	0	0	0	0	0

*The category ‘other’ includes heat and biomass.

Assumptions for agriculture sector: macroeconomic models

parameter	***unit***	***1996-2000***		***2001-2005***		***2006-2010***		***2011-2015***		***2015-2020***	
share of agriculture	mutations vis-a-vis preceding year in %/yr	***SE***	***GE***	***SE***	***GE***	***SE***	***GE***	***SE***	***GE***	***SE***	***GE***
in GDP	added value	1.0	1,0	0.2	0,0	1.3	1,6	0.2	1,2	0.3	1,3
in relative growth	production value	1.2	1.2	0.0	-0.2	1.0	1.2	-0.2	0.9	-0.1	1.0

Assumptions for agriculture sector: other models

parameter	***value in 2000***	***annual growth in %/yr 2000-2010***		***annual growth in %/yr 2011-2020***	
		SE	***GE***	***SE***	***GE***
number of beef cattle	448 000*	-4.05	-3.7	-0.6	-16.5
number of dairy cows	1 504 000	-0.7	-0.7	0.5	2.1
number of sheep	1 408 000	0.4	0.4	1.7	1.7
number of pigs	13 118 000	-1.6	-1.6	-3.8	0.1
number of poultry	104 015 000	-1.5	-0.3	-2.4	0.6
hectare crop area	943 640	-1.3	-0.8	-0.3	-2.5
hectare grassland	1 011 887	0.1	-0.4	-0.1	0.6
emission factors	***value in 2000***	***value in 2010***		***value in 2020***	
		SE	***GE***	***SE***	***GE***
enteric fermentation, in kg CH_4 per average animal					
• beef cattle	54	53	53	54	55
• dairy cows	109	119	119	120	123
• sheep	8	8	8	8	8
manure management, fertilizer use in kg N_2O per kg N use	0.039	0.04	0.04	0.04	0.04

*excl. 783 000 veal calves

Assumptions for waste sector*

parameter	***value in 2000***	***value in 2010***		***value in 2020***	
		SE	***GE***	***SE***	***GE***
tonnes municipal solid waste[1]	9.8 mln	n.a.	n.a.	n.a.	n.a.
organic fraction municipal solid waste, in %[2]	35	n.a.	n.a.	n.a.	n.a.
share municipal solid waste disposed to landfills, in %	15	n.a.	n.a.	n.a.	n.a.
share of municipal solid waste incinerated, in %	37	n.a.	n.a.	n.a.	n.a.
share of municipal solid waste composted, in %	20	n.a.	n.a.	n.a.	n.a.

*not used in modelling approach in the Netherlands

[1]municipal solid waste defined as waste collected by or by order of the municipality (household waste plus sanitation department waste)

[2]organic fraction defined as fruit, vegetable and garden waste (whether or not separately collected) from households plus green fraction of sanitation department waste

Assumptions for forestry sector

parameter	*amount in 2000*	*amount in 2010*	*amount in 2020*
hectare managed forest	342 000	347 700	353 400
hectare of unmanaged forest	26 000	26 500	27 000
total	368 000	374 200	380 400

Forest definition

Forest land is land with woody vegetation and with tree crown cover of more than 20 per cent and area of more than 0.5 hectare. The trees should be able to reach a minimum height of 5 meters at maturity in situ. Forest land may consist of either closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or of open forest formations with a continuous vegetation cover in which tree crown cover exceeds 20 per cent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 20 per cent or tree height of five meters are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.

Forest land also includes:

- Forest nurseries and seed orchards that constitute an integral part of the forest;
- Forest road, cleared tracts, firebreaks and other small open areas, all smaller than 6 meter within the forest
- Forest in national parks, nature reserves and other protected areas such as those of special environmental, scientific, historic, cultural or spiritual interest, with an area of more than 0.5 hectare and a width of more than 30 meters;
- Windbreaks and shelterbelts of trees with an area of more than 0.5 hectare and a width of more than 30 meters.

This excludes tree stand in agricultural production systems for example in fruit plantations and agro forestry systems.

Annex 4
IPCC source categories related to sectoral definitions

sector	*activity*	*IPCC source category*
energy	centralized and own generation of power, energy distribution, oil and gas production, refineries	1A1, 1B, part of 2[1]
industry	chemicals, foodstuffs and luxury items, paper, basic metals, construction materials, other metals, other industry, cokes manufacturing, construction	1A2, part of 2
transport	transport incl. mobile equipment and off-road vehicles from construction, agriculture and services	1A3, part of 1A4c, part of 1A2f
agriculture	agriculture and horticulture excl. mobile equipment and off-road vehicles	1A4c,4
waste	waste incineration[2] and landfills	6
buildings	households, services excl. mobile equipment and off-road vehicles	3, 1A4a, 1A4b

[1]emissions due to flue gas desulfurization

[2]when electricity is generated by waste incineration, the emissions are allocated to the energy sector.

IPCC category 5 is not included in the projections. The forest carbon balance is projected separately in section 2.7.

Annex 5
Policies and measures in the three policy variants

Policy Instrument	*'Without measures' variant*	*'With measures' variant*	*'With additional measures' variant*
CO_2 emissions trading	No CO_2 emissions trading	CO_2 price € 2/tonne in 2005; €7/tonne in 2010; €11/tonne in 2020.	Same as with measures.
Energy tax	Energy tax (old regulatory tax and old fuel tax) repealed for all sectors after 2000	Tax rates for non-trading sectors assumed to be at least equal to rates for trading sectors plus CO_2 price	Same as with measures.
EPR, EPA existing buildings	EPR and EPA are not introduced; there are no subsidy programs.	EPA replaced by EU Directive Energy Performance Buildings as of 2006; EPR discontinued.	CO_2 Tender Scheme for Buildings as possible replacement for EPR.
EPN, EPC for new buildings	All building regulations pertaining to energy conservation are repealed after 2000.	Standard for non-residential buildings at current level; standard for residential buildings tightened to 0,8 in 2007.	Same as 'with measures'.
EPR, Energy labelling of appliances	Labelling and EPR both repealed.	Continuation of labelling scheme. EPR repealed.	Same as 'with measures'.
EIA/Vamil other than for CHP and renewables	Tax breaks repealed after 2000.	Tax break continues at current level, about 19% of (additional) investment cost; budget cut by €100 mln; technology criteria equivalent to € 14-70/tonne CO2.	Same as 'with measures'.
EINP	Repealed after 2000	Repealed as of 2003.	Same as 'with measures'.
CO_2 Reduction Program/General and Clean Fossil Fuels Program	Programs discontinued after 2000.	Temporary support for selected technologies; criteria equivalent to € 14-70/tonne CO_2-eq., budget limited	Same as 'with measures'.
Benchmark Covenant and LTA-2	Benchmark Covenant and LTA-2 repealed after 2000	Replaced by emissions trading with continued use of benchmarks as basis for allocation of emission credits	Same as 'with measures'.
Environmental Permit and LTA	No energy requirements in environmental permits after 2000.	Remains at current level (all energy measures with IRT>15% must be taken), applies to non-trading companies only.	Same as 'with measures'.
Glami and Orders in Council Greenhouse Horticulture	Glami and Orders in Council repealed after 2000	Orders in Council expire in 2010, thereafter same treatment as environmental permit (all energy measures with IRT>15% must be	Same as 'with measures'.

		taken).	
MEP – renewables and other economic incentive policies (Green Funds, EIA/Vamil)	MEP not introduced. Other economic incentives for renewables repealed as of 20000.	Continuation of current scheme: subsidy for non-economic top of currently defined technologies such that subsidy decliines with decreasing costs for renewables; no budget limits. Art. 36i per 1 January 2005 repealed; MEP grows accordingly.	Same as 'with measures'.
MEP – CHP	All incentives for CHP repealed after 2000.	Current scheme continued based on 50% of average non-economic top to extent needed	Same as 'with measures'.
Coal Covenant	No coal covenant signed.	In force until 2012.	Same as 'with measures'.
EU Agreement with car manufacturers	No agreement.	Continuation of current agreements with same target: 140 grams CO_2/km from new cars in 2008/2009.	Same as 'with mesures'.
Energy labelling of cars	Not introduced.	Continuation of current scheme.	Same as 'with measures'.
Tax exemption for hybrid cars	Not included.	Not included.	Hybrid cars exempted from purchase tax .
CO_2 differentiation in purchase tax on new cars	Not included.	Not included.	Purchase tax differentiated according to CO_2 emissions as of 1 January 2006.
Kilometer charge	Not included.	No kilometer charge (not implemented or adopted as of 1 December 2004).	Impacts of two price variants estimated.
Other fiscal measures affecting transport sector	Raises in excises since 2000 assumed not to occur.	Continuation of current tax regimes and excise duties	Same as 'with measures'.
Biofuels Directive	Not included.	Not included (not implemented or adopted as of 1 December 2004)	2% biofuels in 2010.
Enhanced enforcement of speed limit	No enhanced enforcement.	As announced.	Same as 'with measures'.
The New Driving Force	Program repealed after 2000.	Exisiting program continued.	Same as 'with measures'.
CO_2 Reduction Program/Freight Transport	Program not included.	Exisiting projects continued.	Same as 'with measures'.

CO_2 Reduction Progam/passenger transport	Projects not included.	Existing projects continued.	Same as ‘with measures’.
Quieter, Cleaner, More Fuel-Efficient Program	Program repealed after 2000.	Program in place.	Same as ‘with measures’.
afterburner HCFC production	Afterburner in place, but improvements after 2000 void.	No further improvements to afterburner assumed.	Same as ‘with measures’.
CH_4 gas sector	Covenant repealed after 2000.	Covenant with oil and gas producers continues.	Same as ‘with measures’.
CH_4, waste sector	Agreements void after 2000.	Agreement as to amounts and composition of waste to be landfilled in 2010 and 2020 based on National Waste Plan.	Same as ‘with measures’.
CH_4, N_2O agricultural sector	All measures repealed after 2000.	Ammonia policies, manure policies and Common Agricultural Policy	Same as ‘with measures’.
Process adjustments aluminium production	No measures at aluminium plants after 2000.	PFC reduction by means of pointfeeder prebake as of 2005.	Same as ‘with measures’.
Catalytic reduction nitric acid production	Not included.	Not included.	Catalytic reduction at nitric acid production plants.
Emission ceiling semi-conductor industry	Measure repealed after 2000	Ceiling continued at current level.	Same as ‘with measures’.
EU F-gas regulations	Not included.	Not included.Autonomous improvement in leak control from car airco assumed in scenario’s.	Additional impact after 2015.

Annex 6
Emissions Projections by scenario, policy variant and year

The following tables show actual emissions by gas and sector in 1990, 1995 and 2003. The figures are taken from the National Inventory Report 2005. When comparing these figures with the tables containing projections on the following pages, it needs to be borne in mind that the projections were based on the provisional recalculation of historic emission figures as submitted to the European Commission on 15 January 2005. Between January and March, when the recalculations were completed, further improvements were made. In a number of cases the final numbers were higher than the provisional ones. As a result, it is possible that the emission projections for 2010 and 2020 may be underestimated.

1990

Sector	***Emissions (in Gg CO_2-equivalents)***						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**Total**
Energy	53.0	2.1	0.2	-	-	-	55.3
Transport	30.5	0.1	0.3	-	-	-	30.9
Industry	39.2	0.4	8.5	4.4	2.1	0.2	54.8
Agriculture	8.3	10.3	11.6	-	-	-	30.2
LUCF	2.9	-	-	-	-	-	2.9
Waste	-	12.3	0.5	-	-	-	12.8
Buildings	26.9	0.4	-	-	-	-	27.3
Other	--	-	0.2	-	-	-	0.2
Total excl. LUCF	*158.0*	*25.6*	*21.3*	*4.4*	*2.1*	*0.2*	*211.7*
Total incl. LUCF	*160.9*	*25.6*	*21.3*	*4.4*	*2.1*	*0.2*	*214.6*

1995

Sector	***Emissions (in Gg CO_2-equivalents)***						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**Total**
Energy	62.3	2.1	0.2	-	-	-	64.6
Transport	33.5	0.1	0.5	-	-	-	34.1
Industry	34.8	0.3	8.3	6.0	1.8	0.3	51.5
Agriculture	8.3	10.1	12.6	-	-	-	31.0
LUCF	2.7	-	-	-	-	-	2.7
Waste	-	10.8	0.5	-	-	-	11.3
Buildings	30.8	0.4	-	-	-	-	31.2
Other	-	-	0.2	-	-	-	0.2
Total excl. LUCF	*169.7*	*23.8*	*22.4*	*6.0*	*1.8*	*0.3*	*224.0*
Total incl. LUCF	*172.3*	*23.8*	*22.4*	*6.0*	*1.8*	*0.3*	*226.7*

2003

Sector	***Emissions (in Gg CO_2-equivalents)***						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**Total**
Energy	68.5	1.2	0.2	-	-	-	69.9
Transport	38.4	0.1	0.5	-	-	-	39.0
Industry	32.1	0.3	6.7	1.4	1.4	0.3	42.2
Agriculture	7.0	8.5	9.4	-	-	-	24.9
LUCF	2.8	-	-	-	-	-	2.8
Waste	-	7.0	0.4	-	-	-	7.4
Buildings	30.8	0.3	-	-	-	-	31.1
Other	-	-	0.1	-	-	-	0.1S
Total excl. LUCF	*176.9*	*17.5*	*17.3*	*1.4*	*1.4*	*0.3*	*214.8*
Total incl. LUCF	*179.6*	*17.5*	*17.3*	*1.4*	*1.4*	*0.3*	*217.6*

Strong Europe, With measures

Sector	*Emissions (in Gg CO_2-equivalents)*						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**total**
2005							
Energy	68.8	0.8	0.3				69.9
Transport	36.7		0.5				37.1
Industry	33.8		7.0	1.9	1.0	0.3	44.0
Agriculture	7.3	8.5	9.5				25.3
LULUCF	0.5						0.5
Waste		6.4	0.3				6.7
Buildings	28.6		0.1				28.7
Total incl. LULUCF	*175.6*						*212.2*
Total excl. LULUCF	*175.1*	*15.7*	*17.6*	*1.9*	*1.0*	*0.3*	*211.7*
2010							
Energy	72.5	0.3	0.3				73.1
Transport	38.1		0.5				38.6
Industry	34.6		7.1	2.5	0.6	0.3	45.2
Agriculture	6.8	8.3	8.9				24.0
LULUCF	0.4						0.4
Waste		4.4	0.3				4.7
Buildings	27.1		0.1				27.2
Total incl. LULUCF	*179.6*						*213.2*
Total excl. LULUCF	*179.2*	*13.0*	*17.2*	*2.5*	*0.6*	*0.3*	*212.8*
2015							
Energy	78.2	0.3	0.3				78.8
Transport	42.0		0.6				42.5
Industry	34.7		7.2	2.7	0.6	0.2	45.5
Agriculture	6.0	8.2	8.6				22.8
LULUCF	0.3						0.3
Waste		3.3	0.3				3.6
Buildings	25.7		0.1				25.8
Total incl. LULUCF	*186.9*						*219.3*
Total excl. LULUCF	*186.6*	*11.8*	*17.0*	*2.7*	*0.6*	*0.2*	*219.0*
2020							
Energy	76.8	0.3	0.3				77.3
Transport	45.8		0.7				46.5
Industry	34.9		7.3				45.9
Agriculture	5.6	8.0	8.2				21.8
LULUCF	n.a.						n.a.
Waste		2.2	0.3				2.5
Buildings	24.4		0.1				24.5
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*187.4*	*10.6*	*16.8*	*2.9*	*0.7*	*0.2*	*218.5*

Strong Europe, Without measures

Sector	*Emissions (in Gg CO_2-equivalents)*						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**total**
2005							
Energy	71.1	1.1	0.3				72.4
Transport	37.4		0.5				37.8
Industry	34.6		7.0	4.3	2.1	0.3	48.3
Agriculture	7.4	8.6	9.9				25.9
LULUCF	n.a.						n.a.
Waste		9.4	0.3				9.7
Buildings	29.4		0.1				29.4
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*179.7*	*19.1*	*18.0*	*4.3*	*2.1*	*0.3*	*223.6*
2010							
Energy	79.7	0.6	0.3				80.6
Transport	39.5		0.5				40.0
Industry	35.7		7.1	5.4	1.7	0.3	50.2
Agriculture	7.1	8.6	9.5				25.2
LULUCF	n.a.						n.a.
Waste		8.4	0.3				8.7
Buildings	28.9		0.1				29.0
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*190.9*	*17.6*	*17.8*	*5.4*	*1.7*	*0.3*	*233.8*
2015							
Energy	93.7	0.6	0.3				94.6
Transport	43.4		0.6				43.9
Industry	35.8		7.2	5.6	1.7	0.2	50.6
Agriculture	6.6	8.3	8.9				23.8
LULUCF	n.a.						n.a.
Waste		8.3	o.3				8.6
Buildings	28.7		0.1				28.8
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*208.3*	*17.2*	*17.3*	*5.6*	*1.7*	*0.2*	*250.4*
2020							
Energy	96.8	0.6	0.3				96.7
Transport	47.2		0.7				47.9
Industry	36.8		7.3				51.8
Agriculture	6.2	8.0	8.2	5.8	1.8	0.2	22.4
LULUCF	n.a.						n.a.
Waste		8.2	0.3				8.5
Buildings	29.0						29.0
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*216.0*	*16.9*	*16.8*	*5.8*	*1.8*	*0.2*	*257.3*

Strong Europe, With additional measures

Sector	*Emissions (in Gg CO_2-equivalents)*						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**total**
2005							
Energy	68.8	0.8	0.3				69.9
Transport	36.7		0.5				37.1
Industry	33.8		3.0	1.9	1.0	0.3	40.0
Agriculture	7.3	8.5	9.5				25.3
LULUCF	n.a.						n.a.
Waste		6.4	0.3				6.7
Buildings	27.9-28.6		0.1				28.6
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*174.5-175.1*	*15.7*	*13.6*	*1.9*	*1.0*	*0.3*	*207.0-207.7*
2010							
Energy	72.5	0.3	0.3				73.1
Transport	36.6-37.4		0.5				37.1-37.9
Industry	34.6		3.1	2.5	0.6	0.3	41.2
Agriculture	6.8	8.3	8.9				24.0
LULUCF	n.a.						n.a.
Waste		4.4	0.3				4.7
Buildings	26.4-27.1		0.1				26.4-27.2
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*176.9-178.5*	*13.0*	*13.2*	*2.5*	*0.6*	*0.3*	*206.6-208.1*
2015							
Energy	78.2	0.3	0.3				78.8
Transport	40.4-41.3		0.6				41.0-41.8
Industry	34.7		3.2	2.7	0.6	0.2	41.5
Agriculture	6.0	8.2	8.6				22.8
LULUCF	n.a.						n.a.
Waste		3.3	0.3				3.6
Buildings	25.0-25.7		0.1				25.1-25.8
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*184.4-185.9*	*11.8*	*13.0*	*2.7*	*0.6*	*0.2*	*212.7-214.3*
2020							
Energy	76.8	0.3	0.3				77.3
Transport	44.345.1		0.7				44.9-45.8
Industry	34.9		3.3	2.9	0.7	0.2	41.9
Agriculture	5.6	8.0	8.2				21.8
LULUCF	n.a.						n.a.
Waste		2.2	0.3				2.5
Buildings	23.724.4		0.1				23.8-24.5
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*185.2-186.7*	*10.6*	*12.8*	*2.9*	*0.7*	*0.2*	*212.3-213.8*

Global Economy, With measures

Sector	Emissions (in Gg CO_2-equivalents)						
	CO_2	CH_4	N_2O	HFC	PFC	SF_6	total
2005							
Energy	69.6	0.8	0.3				70.6
Transport	36.7		0.5				37.1
Industry	33.9		7.1	1.9	1.0	0.3	44.2
Agriculture	7.6	8.6	9.5				25.7
LULUCF	0.5						0.5
Waste		6.4	0.3				6.7
Buildings	28.9		0.1				28.9
Total incl. LULUCF	*177.0*						*213.7*
Total excl. LULUCF	*176.5*	*15.7*	*17.8*	*1.9*	*1.0*	*0.3*	*213.2*
2010							
Energy	75.0	0.3	0.3				75.6
Transport	38.1		0.5				38.6
Industry	32.1		7.3	2.5	0.6	0.3	42.8
Agriculture	7.7	8.3	9.2				25.2
LULUCF	0.4						0.4
Waste		4.4	0.3				4.7
Buildings	28.3						
Total incl. LULUCF	*183.6*						*217.7*
Total excl. LULUCF	*183.2*	*13.0*	*17.6*	*2.5*	*0.6*	*0.3*	*217.3*
2015							
Energy	79.0	0.2	0.3				79.5
Transport	42.0		0.6				42.5
Industry	38.8		7.5	2.7	0.7	0.2	44.9
Agriculture	7.5	8.8	9.5				25.8
LULUCF	0.3						0.3
Waste		3.3	0.3				3.6
Buildings	27.7		0.1				27.8
Total incl. LULUCF	*192.3*						*226.5*
Total excl. LULUCF	*192.0*	*12.4*	*18.2*	*2.7*	*0.7*	*0.2*	*226.2*
2020							
Energy	87.3	0.2	0.3				87.8
Transport	45.8		0.7				46.5
Industry	35.4		7.6	2.9	0.7	0.2	46.8
Agriculture	7.5	9.4	9.8				26.7
LULUCF	n.a.						n.a.
Waste			0.3				2.5
Buildings	27.3		0.1				27.4
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*205.3*	*11.8*	*18.8*	*2.9*	*0.7*	*0.2*	*239.7*

Global Economy, Without measures

Sector	Emissions (in Gg CO_2-equivalents)						
	CO_2	CH_4	N_2O	HFC	PFC	SF_6	total
2005							
Energy	71.6	1.1	0.3				72.9
Transport	37.4		0.5				37.8
Industry	35.0		7.1	4.3	2.1	0.3	48.9
Agriculture	7.8	8.7	9.9				26.4
LULUCF	n.a.						n.a.
Waste		9.4	0.3				9.7
Buildings	29.5		0.1				29.6
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*181.2*	*19.1*	*18.2*	*4.3*	*2.1*	*0.3*	*225.3*
2010							
Energy	82.3	0.6	0.3				83.2
Transport	39.5		0.5				40.0
Industry	36.2		7.3	5.4	1.7	0.3	50.9
Agriculture	8.1	8.6	9.8				26.5
LULUCF	n.a.						n.a.
Waste		8.4	0.3				8.7
Buildings	30.2		0.1				30.3
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*196.4*	*17.6*	*18.2*	*5.4*	*1.7*	*0.3*	*239.6*
2015							
Energy	97.0	0.5	0.3				97.8
Transport	43.4		0.6				43.9
Industry	38.3		7.5	5.6	1.8	0.2	53.4
Agriculture	8.2	9.0	9.8				27.0
LULUCF	n.a.						n.a.
Waste		8.3	0.3				8.6
Buildings	31.1		0.1				31.2
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*218.0*	*17.8*	*18.5*	*5.6*	*1.8*	*0.2*	*262.0*
2020							
Energy	112.9	0.5	0.3				113.7
Transport	47.2		0.7				47.9
Industry	39.4		7.6	5.8	1.8	0.2	54.8
Agriculture	8.2	9.4	9.8				27.4
LULUCF	n.a.						n.a.
Waste		8.2	0.3				8.5
Buildings	32.7		0.1				32.7
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*240.4*	*18.1*	*18.8*	*5.8*	*1.8*	*0.2*	*285.0*

Global Economy, With additional measures

Sector	*Emissions (in Gg CO_2-equivalents)*						
	CO_2	**CH_4**	**N_2O**	**HFC**	**PFC**	**SF_6**	**total**
2005							
Energy	69.6	0.8	0.3				70.6
Transport	36.7		0.5				37.2
Industry	33.9		3.1	1.9	1.0	0.3	40.2
Agriculture	7.6	8.6	9.5				25.7
LULUCF	n.a.						n.a.
Waste		6.4	0.3				6.7
Buildings	28.2-28.9		0.1				28.2-28.9
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*175.8-176.5*	*15.7*	*13.8*	*1.9*	*1.0*	*0.3*	*208.6-209.2*
2010							
Energy	75.0	0.3	0.3				75.6
Transport	36.6-37.4		0.5				37.1-37.9
Industry	34.1		3.3	2.5	0.6	0.3	40.8
Agriculture	7.7	8.3	9.2				25.2
LULUCF	n.a.						n.a.
Waste		4.4	0.3				4.7
Buildings	27.6-28.3		0.1				27.6-28.3
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*181.0-182.5*	*13.0*	*13.6*	*2.5*	*0.6*	*0.3*	*211.0-212.6*
2015							
Energy	79.0	0.2	0.3				79.5
Transport	40.4-41.3		0.6				40.0-41.8
Industry	35.8		3.5	2.7	0.7	0.2	42.9
Agriculture	7.5	8.8	9.5				25.8
LULUCF	n.a.						n.a.
Waste		3.3	0.3				3.6
Buildings	27.0-27.7		0.1				27.1-27.8
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*189.7-191.3*	*12.4*	*14.2*	*2.7*	*0.7*	*0.2*	*219.9-221.5*
2020							
Energy	87.3	0.2	0.3				87.8
Transport	44.3-45.1		0.7				44.9-45.8
Industry	37.4		3.6	2.9	0.7	0.2	44.8
Agriculture	7.5	9.4	9.8				26.7
LULUCF	n.a.						n.a.
Waste		2.2	0.3				2.5
Buildings	26.6-27.3		0.1				26.7-27.4
Total incl. LULUCF	*n.a.*						*n.a.*
Total excl. LULUCF	*203.1-204.6*	*11.8*	*14.8*	*2.9*	*0.7*	*0.2*	*233.4-235.0*

Annex 7: Mandatory indicators pursuant to Annex III, Implementing Provisions

Strong Europe Scenario, 'With measures'variant

No	Eurostat Sectors	Indicator	2005	2010	2015	2020	Numerator/denominator	2005	2010	2015	2020
1	Macro	CO_2 intensity of GDP, t/mio Euro	0.44	0.42	0.40	0.37	total CO_2 emissions, kt	175 110	179 195	186 683	187 432
							GDP, bio Euro (EC95)	339 578	431 487	470 168	513 198
2	Transport C0	CO_2 emissions from passenger cars, kt	18 291	17 962	18 297	18 631					
		number of kilometers by passenger cars, Mkm	104 319	110 832	118 492	126 152					
3	Transport D0	CO_2 emissions from freight transport (all modes), kt	15 200	16 700	20 100	23 500					
		freight transport (all modes), Mtkm[1]	n.a.	n.a.	n.a.	n.a.					
4	Industry A1	energy related CO_2 intensity of industry, t/mio Euro	450.43	426.95	384.96	348.73	CO_2 emissions from fuel consumption industry, kt	26 636	27 142	26 805	26 637
							gross value-added total industry, bio Euro (EC 95)	59.12	63.57	69.63	76.38
5	Households A1	specific CO_2 emissions of households t/dwelling	2.72	2.50	2.29	2.11	CO_2 emissions from fossil fuel consumption households, kt	18 465	18 465	16 954	16 151
							Stock of permanently occupied dwellings, 1000	6 786	7 088	7 393	7 661
6	Services A0	CO_2 intensity of the services sector, t/mio Euro	43.12	38.90	30.78	26.37	CO_2 emissions from fossil fuel consumption services, kt	10 347	19 838	9 102	8 630
							gross value-added services, bio Euro (EC95)	239.93	266.90	295.70	327.30
7	Transform-ation B0	specific CO_2 emissions of public and autoproducer power plants, t/TJ	153.55	146.96	147.04	138.37	CO_2 emissions from public and autoproducer thermal power stations, kt	51 642	53 788	59 489	57 612
							all products-output by public and autoproducer thermal power stations, PJ	336	366	405	416
8	Agriculture	specific N_2O emissions of fertilizer and manure use, kg/kg	0.04	0.04	0.04	0.04	N_2O emissions from synthetic fertilizer and manure use, kt	27 000	26 000	25 000	24 000
							use of synthetic fertiliser and manure, kt nitrogen	682	649	626	603
9	Agriculture	specific CH_4 emissions of cattle production, kg/head	69.52	71.18	71.80	72.69	CH_4 emissions from cattle, kt	253	247	249	252
							cattle populations, 1000 head	3 639	3 470	3 468	3 467
10	Waste	specific CH_4 emissions from landfills, kt/kt	0.08	0.09	0.07	0.05	CH_4 emissions from landfills, kt	3 05	208	156	104
							municipal solid waste going to landfills, kt	3 810	2 400	2 50	1 900

[1] data are not available

Global Economy Scenario, 'With measures' variant

No	Eurostat Sectors	Indicator	2005	2010	2015	2020	Numerator/denominator	2005	2010	2015	2020
1	Macro	CO_2 intensity of GDP, t/mio Euro	0.44	0.39	0.36	0.33	total CO_2 emissions, kt	176 486	183 246	191 966	205 325
							GDP, bio Euro (EC95)	400 468	466 227	533 754	613 496
2	Transport C0	CO_2 emissions from passenger cars, kt	18 291	17 962	18 297	18 631					
		number of kilometers by passenger cars, Mkm	104 319	110 832	118 492	126 152					
3	Transport D0	CO_2 emissions from freight transport (all modes), kt	15 200	16 700	20 100	23 500					
		freight transport (all modes), Mtkm[1]	n.a.	n.a.	n.a.	n.a.					
4	Industry A1	energy related CO_2 intensity of industry, t/mio Euro	444.75	393.18	368.07	337.93	CO_2 emissions from fuel consumption industry, kt	26 706	26 544	27 756	28 914
							gross value-added total industry, bio Euro (EC 95)	60.05	67.51	75.41	85.56
5	Households A1	specific CO_2 emissions of households t/dwelling	2.75	2.54	2.34	2.18	CO_2 emissions from fossil fuel consumption households, kt	18 660	18 413	18 184	17 919
							Stock of permanently occupied dwellings, 1000	6 792	7 254	7 755	8 211
6	Services A0	CO_2 intensity of the services sector, t/mio Euro	42.63	34.40	28.56	23.93	CO_2 emissions from fossil fuel consumption services, kt	10 450	10 127	9 867	9 713
							gross value-added services, bio Euro (EC95)	245.15	294.40	345.59	405.88
7	Transform-ation B0	specific CO_2 emissions of public and autoproducer power plants, t/TJ	152.59	144.85	141.43	144.44	CO_2 emissions from public and autoproducer thermal power stations, kt	52 313	56 195	60 369	66 705
							all products-output by public and autoproducer thermal power stations, PJ	343	388	427	462
8	Agriculture	specific N_2O emissions of fertilizer and manure use, kg/kg	0.04	0.04	0.04	0.04	N_2O emissions from synthetic fertilizer and manure use, kt	28 900	26 400	27 500	28 600
							use of synthetic fertiliser and manure, kt nitrogen	722	660	689	718
9	Agric ulture	specific CH_4 emissions of cattle production, kg/head	69.14	70.15	74.78	79.35	CH_4 emissions from cattle, kt	255	248	263	279
							cattle populations, 1000 head	3 688	3 516	3 217	3 516
10	Waste	specific CH_4 emissions from landfills, kt/kt	0.08	0.09	0.07	0.05	CH_4 emissions from landfills, kt	305	208	156	104
							municipal solid waste going to landfills, kt	3 810	2 400	2 150	1 900

[1] data are not available

Annex 8
Emissions projections for international bunkers

Projections of quantities of bunker fuels, in SE scenario, in PJ

Fuel type	*2005*	*2010*	*2015*	*2020*
Lubricants	6.8	7.2	7.8	8.4
Kerosene	157.9	179.4	190.3	201.2
Marine diesel	77.7	79.4	80.4	81.3
Bunker oil	500.2	527.3	545.2	563.1

Projection of quantitities of bunker fuels, in GE scenario, in PJ

Fuel type	*2005*	*2010*	*2015*	*2020*
Lubricants	7.1	7.9	8.9	9.9
Kerosene	157.9	179.4	190.3	201.2
Marine diesel	77.7	79.4	80.4	81.3
Bunker oil	524.7	576.2	624.2	672.2

Projections of CO_2 emissions from bunker fuels, SE scenario, in Mtonnes

Fuel type	*2005*	*2010*	*2015*	*2020*
Lubricants	0.5	0.5	0.6	0.6
Kerosene	11.2	12.8	13.6	14.4
Marine diesel	5.8	5.9	6.0	6.0
Bunker oil	38.7	40.8	42.2	43.6

Projections of CO_2 emissions from bunker fuels, GE scenario, in Mtonnes

Fuel type	*2005*	*2010*	*2015*	*2020*
Lubricants	0.6	0.6	0.7	0.7
Kerosene	11.2	12.8	13.6	14.4
Marine diesel	5.8	5.9	6.0	6.0
Bunker oil	40.6	44.6	48.3	52.0

Annex 9
Implementation of Common and Coordinated Policies and Measures in the Netherlands

nr.	*CCPM*	*name of national measure*	*reference to the measure in compilation of policies and measures already reported under Monitoring Mechanism*	*quantitative effect on emission reduction of the measure, if assessed*
1	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	The enabling legislation consists of Amendments to the Environmental Management Act and Orders and Decrees issued pursuant to the Environmental Management as noted in the communication to the Secretary-General of the Commission dated 11 January 2005. References are: Staatsblad 2004, 511, 516, and 737 and Staatscourant 2004, 250. The National Allocation Plan 2005-2007 has been approved by the European Commission. (Commission Decision C(2004) 2515/1 final The Netherlands register for CO_2 emissions trading has been approved by the European Commission.	Not mentioned in earlier reports; trading begun in 2005.	[*Dril et.al.,2005*] estimates the impact of trading on domestic emissions (given a CO_2 price of €2 per tonne in 2005, €7 per tonne in 2010 and €11 per tonne in 2020) as 0.3 Mtonne avoided emissions in 2005, 1.4 Mtonne in 2010, 4.1 in 2015 and 1.3 in 2020. These emission reductions would be insufficient to bring total emissions from trading companies under the 2005-2007 ceiling (that is, 92 Mtonne) so Dutch companies would also have to purchase allowances from outside the Netherlands if the ceiling were to remain at the same level.
2	Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity	Amendment to the Environmental Taxes Act and the Excise Duties Act, entry into force on 1 Jan 2004. Staatsblad: 2003 532	*[MHSPE, 2004]* refers to both the regulatory energy tax and the fuel tax, the two precursors to the new Energy Tax. The Directive has been implemented in the Netherlands by changes to these two existing taxes.	Implementation of 2003/96/EC in and of itself has no effect on emissions on the Netherlands. The minimum tax rates in the directive are lower than those already in effect in the Netherlands. The directive supports the policy in the Netherlands and

nr.	*CCPM*	*name of national measure*	*reference to the measure in compilation of policies and measures already reported under Monitoring Mechanism*	*quantitative effect on emission reduction of the measure, if assessed*
			Both of the regulatory energy tax and the fuel tax were in existence before adoption of Council Directive 2003/96/EC (the energy tax since the mid-nineties and the fuel tax since the early eighties).	other countries which already introduced energy taxes in anticipation of introduction of a harmonized system. The directive also provides a framework for further development of energy taxes in the Netherlands. Although the directive has no impact, the taxes which have been in existence for a number of years do have an impact, the extent of which has been analyzed in various studies. For example, an ex post analysis of climate change policies over the period 1995–2002 estimated the effect of the Netherlands' regulatory energy tax at about 2 Mtonne CO_2-reduction in 2002. *[Joosen et al., 2004]*
3	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	The Netherlands has been promoting electricity produced from renewable energy sources for many years. The approach consists of a combination of fiscal stimuli, subsidies for large investment projects and negotiated agreements. In past years the most important tax policies consisted of special provisions in the regulatory energy tax (in particular articles 36o and 36i). These special provisions have now been replaced with a	*[MHSPE, 2004]* mentions the Climate Covenant with provinces and municipalities, the EIA and the Vamil, Economic incentives for renewable energy and the special provisions in the Regulatory energy tax which they replaced, the Intergovernmental Wind Energy Agreement, and the Coal Covenant.	Implementation of Directive 2001/77/EC in and of itself has no impact on emissions in the Netherlands. There have been various policies in effect since the 1990's to encourage a higher market share for renewable energy. [*Dril et.al., 2005*] suggests that the impacts of these renewables policies will amount to 4.2 Mtonne avoided CO_2 in 2010, 9.4 Mtonne in 2015 and 18.8 Mtonne in 2020.

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		programme of economic incentives for electricity generated from renewable energy sources (the MEP). The Vamil, a provision in the corporate income tax allowing free depreciation of environmental investments, covered renewable energy for many years, but no longer does. The most important instruments currently being deployed include the economic incentives for renewable electricity (the MEP), the Coal Covenant,, the intergovernmental wind energy agreement, the Climate Covenant with provinces and municipalities, and the energy investment tax deduction (EIA).		
4	Directive 2004/8/EC on the promotion of cogeneration	To be implemented via amendment to the Electricity Act. Legislation currently being prepared. Entry into force not later than February 2006.	Amendment of the Electricity Act not mentioned in earlier reports. [*MHSPE, 2004*] refers to economic incentives for combined heat and power.	Implementation of 2004/8/EC in and of itself has no effect on emissions in the Netherlands. The Netherlands has had various policies in place since the 1990's to encourage construction and use of cogeneration plants. The policies pursued since 2000 have been estimated in [*Dril et.al.,2005*] to reduce CO_2 emissions by 1.9 Mtonnes annually in 2010.
5	Motor Challenge Programme, an EC voluntary programme to improve the energy efficiency of motor-driven systems in industrial companies	Implementation in the Netherlands has begun, after positive decision on our application for a subsidy under SAVE, DEXA-MCP (in conjunction with other Member States, France leading country).	Not mentioned in earlier reports.	There has as yet been no analysis done of the expected impact on greenhouse gas emissions in the Netherlands.

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6	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)	The government has designated the Foundation for Coordination of Environmental Management Systems Certification (Stichting Coördinatie Certificatie Milieuzorgsystemen) as the competent body for implementation of EMAS. Promotional activities are reported annually to the Art. 14 Committee.	Not mentioned in earlier reports	No impact on emissions of greenhouse gases is expected. In total 24 companies (out of more than 1000 ISO 14001 companies) have an EMAS registration.
7	Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings	Not yet transposed into national law. This directive will be implemented largely by means of (marginal) changes to existing programs and regulations. The most important are: Energy Performance Advice for existing buildings; Energy Performance Norm and Energy Performance Coefficient for new buildings	*[MHSPE, 2004]* refers to the Energy Performance Advice (EPA), the Energy Performance Norm (EPN) and the Energy Performance Coefficient (EPC).	[*Dril et.al.,2005*] estimates the combined impact of the EPA, EPN, EPC at 2.1 Mtonne avoided CO_2 in 2010, 3.7 Mtonne in 2015 and 5.6 Mtonne in 2020.
8	Various directives pertaining to the energy labelling of appliances, to wit: Council Directive 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances Commission Directive 95/12/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household washing machines	Decree on labelling energy use of cooling and freezing appliances Staatsblad 1994, 673 Framework Decree on labelling energy use by household appliances Staatsblad 1995, 471 Rules on labelling energy use of washing machines Staatscourant 1996, 41 Rules on labelling energy use of	*[MHSPE,2004*] refers to the energy labels and the subsidy program EPR.	In projections carried out for the Dutch government, the impact of labelling has generally been assessed in conjunction with subsidy and public education programs in effect in the past. The general consensus seems to be that it is the subsidies that really transformed the market and resulted in energy savings. However, the subsidies would not have been possible without the labelling. The labelling should therefore be seen as a necessary but not sufficient measure for achieving savings in this segment of the market. The subsidy program for energy efficient appliances was

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	Commission Directive 96/60/EC of 16 September 1996 implementing Council Directive 92/75/EEC with regard to energy labelling of household combined washer-driers Commission Directive 96/89 of 17 December 1996 amending Directive 95/12/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household washing machines. Commission Directive 97/17/EC of 16 April 1997 implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers as amended by Commission Directive 1999/9/EC of 26 February 1999 amending Directive 97/17/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers Commission Directive 98/11/EC of 27 January 1998 implementing Council Directive 92/75/EEC with regard to energy labelling of household lamps Commission Directive 1999/9/EC of 26 February 1999 amending Directive 97/17/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers Commission Directive 2002/31/EC of 22 March 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household air conditioners	combined washer-driers Staatscourant 1996, 241 Amendment to rules on labelling energy use of washing machines Staatscourant 1997, 27 Rules on labelling energy use of dishwashers Staatscourant 1997, 122 amended in Staatscourant 1998, 118 Rules on labelling energy use of lamps Staatscourant 1999, 107 Amendment to rules on labelling energy use of dishwashers Staatscourant 1999, 63 Rules on labelling energy use of air conditioners Staatscourant 2002, 222 amended in Staatscourant 2003, 119 Rules on labelling energy use of ovens Staatscourant 2002, 222 Amendments to rules on labelling energy use of cooling and freezing appliances Staatscourant 2003, 242		repealed in the Netherlands in 2004.

nr.	*CCPM*	*name of national measure*	*reference to the measure in compilation of policies and measures already reported under Monitoring Mechanism*	*quantitative effect on emission reduction of the measure, if assessed*
	Commission Directive 2002/40/EC of 8 May 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric ovens Commission Directive 2003/66/EC of 3 July 2003 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric refrigerators, freezers and their combinations			
9	Council Directive 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels	Decree on efficiency requirements for central heating boilers Staatsblad 1993, 24 amended in Staatsblad 1993, 722 Staatsblad 1994, 829 Staatsblad 1995, 673	Not mentioned in earlier reports	There has been no analysis done of the expected impact on greenhouse gas emissions in the Netherlands.
10	Commission Recommendations of 5 February 1999 and 13 April 2000 on the reduction of CO_2 emissions from passenger cars (voluntary agreement of the car manufacturers from EU, Japan and Korea to reduce fleet average CO_2 emissions to 40 g/km by 2008/09)	The voluntary agreement requires no separate implementation in the Netherlands.	*[MHSPE, 2004(a)]* refers to the EU Agreement on Fuel Efficient Cars	[*Dril et.al.,2005*] estimates the impact of the agreement on emissions in the Netherlands at 0.2 Mtonne avoided CO_2 in 2005 and 0.4 Mtonne in 2010 and thereafter.
11	Shifting the balance between modes of transport, in paticular towards rail transport 2001/12/EC, 2001/13/EC, 2001/14/EC of 15/03/EC, Regulation 881/2004 of 29/04/2004, 2001/49/EC, 2001/50/EC, 2001/51/EC of 29/04/2004	As of 1 January 2005, the Netherlands has implemented 2001/12/EC, 2001/13/EC and 2001/14/EC in national legislation. The other directives and the regulation from 2004 are still being prepared for implementation.	Not mentioned in earlier reports.	There have been no studies of the effects on emissions of these measures, because the effects are mainly indirect (i.e. creating conditions for development of the railway system). However some more general studies have been carried out of the enivronmental effects of modal shift policies. These studies show that policies aimed at shifting freight transport toward

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				the railway sector have very few quantifiable environmental effects. Environmental performance generally depends more on installed technology and logistical characteristics than on mode per se.
12	Directive 2003/30/EC of the European Parliament and the Council of 89 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport	See the Netherlands' report to the European Commission, submitted on 26 July 2004 *[Verslag over 2003 aan de Europese Commissie inzake Richtlijn 2003/30/EG, reference 17011]* which outlines how the Netherlands expects to implement the directive.	Not mentioned in earlier reports	It is uncertain whether this measure will be introduced before 2010. The Traffic Emissions Policy Document announced a target of 2 per cent in 2006. If achieved, this target would reduce emissions by about 0.7 Mtonne CO_2 in 2010. However, this estimate is not well-to-wheel. This means it does not reflect possibly higher emissions in the agricultural sector from raising crops to be used in the manufacture of biofuels.
13	Directive 1999/94/EC of the European Parliament and the Council of 13 December 1999 relating to the availablity of consumer information on fuel economy and CO_2 emissions in respect of the marketing of new passenger cars	Decree of 3 November 2000 containing rules for the labelling of passenger car energy use, entry into force 18 January 2001 Staatsblad 2000 475	*[MHSPE, 2004(a)]* refers to the Labelling of Fuel Efficient Cars.	The labelling scheme introduced in the Netherlands goes further than required in Directive 1999/94/EC. The impact of the Dutch scheme was estimated ex ante to be: 0.3% decline in average fuel use and 0.5 g/km decline in CO_2-emissions, for a total impact in 2010 of 50 kton CO_2 reduction per year. In comparison: the impact of the minimum requirements in the directive were estimated to be 0.1% decline in average fuel use and 0,2 g/km fall in CO_2 emissions for a total reduction of 17 kton per year in 2010.
14	Council regulation (EC) No 1782/2003 of 29 September 2003 establishing common rules for direct support schemes under the common	Regulations on income support under the Common Agricultural Policy	Not mentioned in earlier reports	No impact on emissions of greenhouse gases in the Netherlands is expected at this time.

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	agricultural policy and establishing certain support schemes for farmers and amending Regulations	Staatscourant 2004, 232		
15	Council regulation (EC) No 1783/2003 of 29 September 2003 amending Regulation (EC) No 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF)	Rural Development Programme (approved by the Commission)	Not mentioned in earlier reports.	The impact on emissions of greenhouse gases in the Netherlands is expected to be negligible.
16	Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste	The directive has been implemented in the Netherlands by changes to the Decree on Installations and Permits under the Environmental Management Act, the Decree on Landfills and Landfilling Waste Bans, the Decree on Soil Protection from Landfills and the Implementation Rules under this decree, and the Decree on Exemptions from the Landfilling Ban outside of Installations, as well as by Ministerial Rules pertaining to On-shore landfills for Dredging Sludge.	Not mentioned in earlier reports	The exact impact of implementation of the directive on emissions in the Netherlands has not been estimated. The total impact of all policies in the waste sector has been estimated to be an avoided emission of 4 Mtonne CO_2-eq. in 2010 and 6 Mtonne in 2020 [*Dril et.al.,2005*].

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