The Flemish Climate Policy Plan

2013-2020, a summary

Cover: Twijfelgrens, Fred Eerdekens
Tranendeef, Dré Wapenaar
Art in public space, Borgloon Photos Kristof Vrancken/Z33

Preface

Dear reader,

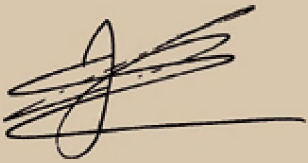
Flanders is a densely populated and highly industrialised region, causing Flanders to have one of the highest energy intensities of Western Europe. Because of its location, Flanders has evolved into an essential transportation hub in Europe, which led to a dense transport infrastructure.

Turning Flanders into an environmentally sustainable top region is the huge challenge I face as Minister in charge of Environment and Nature. The sustainability of Flanders has been steadily increasing since 2000, social indicators remain positive, environment indicators and energy intensity are improving. My policy memorandum for the 2009-2014 term of office emphasises the protection of man and the environment, the sustainable use of natural resources and materials, the preservation and promotion of biological and landscape diversity and the concern for the climate. I will respond to climate change with a dual approach: mitigate (trying to reduce climate change) and adapt (accept the climate change and adjust our way of living accordingly).

The mitigation efforts of the Flemish Government are a continuation of the efforts to limit the climate change to 2°C above the pre-industrial level. To reach this objective the Government of Flanders will take every internal measure that is both technically and economically feasible and acceptable to society. To support these measures, the Flemish Government set up the Flemish Climate Fund to provide a financial framework for its ambitious long term climate policy.

It is of the utmost importance to try and avoid the climate changing. So although even our best efforts will never lead to an unchanged climate, we should never sit back and watch. That's why the implementation of this third Flemish Climate Policy Plan is not an end point, but does provide the next step

in achieving an adapted and low carbon society in Flanders. In the years to come Flanders will continue to develop and strengthen its long term climate policy.



Minister Joke Schauvliege
Flemish Minister for Environment, Nature and Culture

Ardie Van Bommel, Field Furniture
Pit, art parcours Borgloon, Z33 Photos Kristof Vrancken

Sandworm, Marco Casagrande, Beaufort 04 ,2012
Wenduine, Photo Jimmy Kets

PART 1: Overall framework

1 Our climate is changing

In the last hundred years the average temperature on earth has risen by about 0.74 °C. This change is out of the ordinary in both scale and speed. Though many different factors play a part in the climate change we observe, humans have - according to the Intergovernmental Panel on Climate Change (IPCC) - with a high degree of probability (more than 90%), contributed to this change through greenhouse gas emissions. The IPCC's scenarios forecast a 25 to 90% increase in worldwide greenhouse gas emissions between 2000 and 2030. This equates to a further temperature rise of between 1.1 and 6.4 °C between 2000 and 2100.

This climate change will also bring about rising sea levels, increase the severity and frequency of extreme weather conditions (heat waves, droughts, floods, storms, etc.), etc. This will have economic consequences and an impact (negatively) on biodiversity, food supplies (the impact will depend on the severity of climate change and vary from region to region, and is already negative in some areas), health (negatively), etc. The economic, ecological and social effects of this climate change will also affect the more (climate) vulnerable developing countries and threaten to further accentuate world and regional inequality. The longer we wait before taking action, the greater the cost in the end.

2 Action at international level

In 1992, the United Nations Framework Convention on Climate Change or UNFCCC was signed in Rio de Janeiro. The UNFCCC stipulates that concentrations of greenhouse gases in the atmosphere must be stabilised at a level at which no dangerous, human-induced disruption of the climate system takes place.

The UNFCCC does not say how emissions must be reduced. To this end, an additional agreement, the Kyoto Protocol, was concluded under the Framework Convention. The Kyoto Protocol was drafted in 1997 and came into effect in 2005.

For the first time ever, binding targets were imposed to reduce greenhouse gas emissions (for the 2008-2012 period). Besides their obligation to reduce emissions (mitigation), the parties to the Kyoto protocol are required to adopt measures to minimise the negative effects of climate change (adaptation).

At the climate change conference in Cancun (late 2010), the parties to the UNFCCC agreed that the rise in temperature must be less than 2 °C compared to the pre-industrial temperature. At the climate change conference in Durban (late 2011) it was decided to add a second commitment period, from 1 January 2013, and to negotiate by 2015 a new worldwide convention (effective as of 2020) that would be binding for all parties. For the second commitment period of the Kyoto Protocol, a limited number of countries, among them the countries of the EU, accepted a binding emission reduction target.

At the climate change conference in Doha in late 2012, a decision guaranteeing the continuity of the Kyoto Protocol flexibility mechanisms for the

Tadashi Kawamata - project Burchtheuvel - 2012
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second commitment period was made. Only those countries that enter into a commitment will be given full access to these mechanisms.

All parties to the UNFCCC and Kyoto Protocol make a financial contribution to support the activities of the UNFCCC secretariat. Developed countries also provide financial support to assist with adaptation and mitigation initiatives in developing countries. At the climate change conference in Copenhagen (late 2009), developed countries agreed to provide increasing climate funding to reach the figure of USD 100 billion per annum by 2020. This growth path to 2020 is still in need of further elaboration.

3 Flemish climate policy planning

Building on the experience gained with previous climate plans, this third Flemish Climate Policy Plan (VKP) consists of an overall framework and two separate but closely related sections:

- *The Flemish Mitigation Plan (VMP):* the purpose of the VMP is to reduce emissions of greenhouse gasses in Flanders between 2013 and 2020 as a means of combatting climate change. A basis will also be laid for the further emission reductions required towards 2050.
- *The Flemish Adaptation Plan (VAP):* the purpose of the VAP is to understand the Flemish vulnerability to climate change and then improve its ability to defend against its effects.

Although mitigation and adaptation cannot be viewed independently, there are a number of clear differences in their time horizons, sectors and approach and hence Flanders cannot simply apply the same trajectory to the two themes. Internationally as well, mitigation and adaptation are worked out separately despite their strong interrelation. Therefore it was decided to use two different but strongly correlated sub-plans. The two sub-plans together make up the VKP and must be viewed together for a complete picture of Flemish climate policy. The two plans are tied within the Government of Flanders' broader policy framework.

Oil Peak, Maarten Vanden Eynde, Tbilisi, Georgië 2006

PART 2: The Flemish Mitigation Plan (VMP) 2013-2020

1 European policy framework

To keep the temperature change below 2 °C, in February 2011 the European Council again got behind the EU target of reducing greenhouse gas emissions by 80 to 95% compared to 1990 levels by 2050, in accordance with the reduction stipulated by the Intergovernmental Panel on Climate Change for the group of developed countries. To this end, the European Commission presented on 8 March 2011 its "Roadmap for moving to a low carbon economy in 2050". This Roadmap aims to achieve European emission reductions of at least 80% below 1990 levels by 2050. The Roadmap sets pathways for the main sectors: energy, transport, buildings, industry and agriculture. The interim reduction targets set out in the Roadmap are 40% below 1990 levels by the year 2030 and 60% below by 2040. To further pave the way for this European target for 2030, the European Commission published on 27 March 2013 the Green Paper "A 2030 framework for climate and energy policies".

To fulfil its obligations until 2020 at the international level, the EU has developed measures to reduce greenhouse gas emissions. An important instrument in this context is the EU Climate and Energy Package.

The EU Climate and Energy Package is a set of binding, legislative initiatives designed to interpret the EU climate and energy targets for 2020:

- a 20% reduction in energy consumption through more efficient use, compared with the level that would be expected for 2020 if policy were to remain unchanged;
- an increase in the share of renewable energies to 20%;
- a reduction of greenhouse gas emissions to at least 20% below 1990 levels.

These targets were set by EU leaders in March 2007 and became legally binding with the Climate and Energy Package in 2009.

The Climate and Energy Package consists of four complementary legislative components designed to interpret the 20-20-20 targets:

1. Review and strengthening of the European Union's Emission Trading System (EU ETS) for energy intensive businesses via Directive 2009/29/EC. The EU ETS is a very important policy instrument for the energy and industry sectors. The system was designed to achieve the decrease in greenhouse gas emissions by industry at the lowest possible cost. The introduction of an EU-wide cap instead of the existing system of national caps is one of the main changes.
2. National targets for sectors not under the EU ETS via the Effort Sharing Decision (ESD, Decision 406/2009/EC), where the "non-ETS emissions" of all the Member States are subject to linear, reducing annual emission caps between 2013 and 2020. This largely involves the transport, buildings and agricultural sectors and, to a lesser extent, part of the industry and energy sectors that do not fall under ETS.
3. Nationally renewable energy targets via Directive 2009/28/EC. The Belgian target was set at 13%.
4. A legal framework for the environmentally safe implementation of Carbon Capture and Storage (CCS) via Directive 2009/31/EC.

The European reduced greenhouse gas emissions target was thus further divided into an ETS and non-ETS target (Figure 1). This division between ETS and non-ETS during the period 2013-2020 takes place at European level, thus creating equal circumstances for business and industry across Europe. To make the split, the European target of -20% compared to 1990 (the international reference year) was converted to a target of -14% compared to 2005. 2005 was the first year in which the ETS legislation came into effect,

and so it was the first year for which Europe had sufficient data at its disposal on which to base the split.

That European target of -14% compared to 2005 was then further split into:

- A target of -21% compared to 2005 for all companies that fall under the EU ETS.
- A target of -10% compared to 2005 for all sectors that do not fall under the EU ETS. This target was, as described above, further split up among the 27 Member States in the ESD. The Belgian target was set at 15% below 2005 levels.

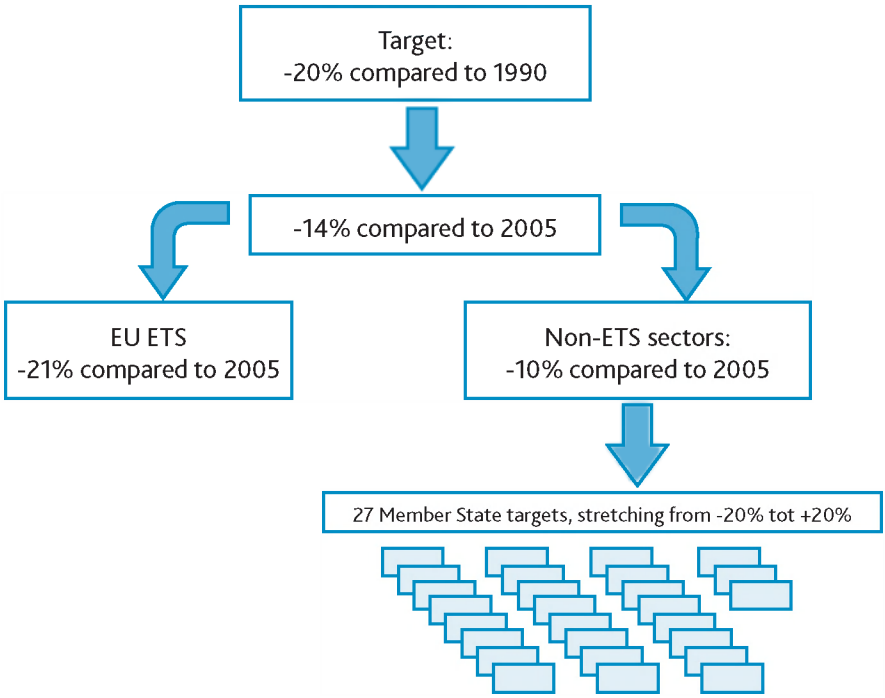

Figure 1. Division of EU 20% target into ETS and non-ETS greenhouse gases

2 The challenge for Flanders

Flanders supports the EU target of reducing European greenhouse gas emissions by 80 to 95% below 1990 levels by 2050, and will provide the required efforts in this long-term European context.

The challenge is a considerable one. In the period 1990-2010, an average annual reduction of 0.4% has been achieved in Europe. However, bringing greenhouse gas emissions in 2050 in line with the European target of at least 80% below 1990 levels will require an average annual European emissions reduction of 4% between now and 2050. The size of the reduction targets implies a significant effort on the part of all emitting sectors.

The specific starting situation and socio-economic context in Flanders will necessarily lead to the development of a specific roadmap for Flanders. Therefore the Flemish Region aims to work out a so-called "low-carbon development strategy". This Flemish strategy will indicate the way in which Flanders will contribute to the long-term targets of the EU. To develop a coherent strategy, work will be done in the coming years to achieve maximum integration of the long-term climate targets into the Flemish sectoral policy plans and the current transition areas of the Flemish Sustainable Development Strategy.

Meeting the long-term targets in an optimal manner requires a well-conceived policy in the short and medium term. The first step in this direction is the achievement of the 2020 target in a way that avoids "lock-in" effects. The European Effort Sharing Decision (ESD) states that the European Member States must reduce their emissions in the non-ETS sectors between 2013 and 2020 along a linear reduction path with annual reduction targets. This path starts in 2013 at the average of the non-ETS emissions for the years 2008, 2009 and 2010. Belgium must then follow a linear emission reduction path that achieves by 2020 an emission reduction of 15% compared with non-ETS emissions in 2005 (Figure 2).

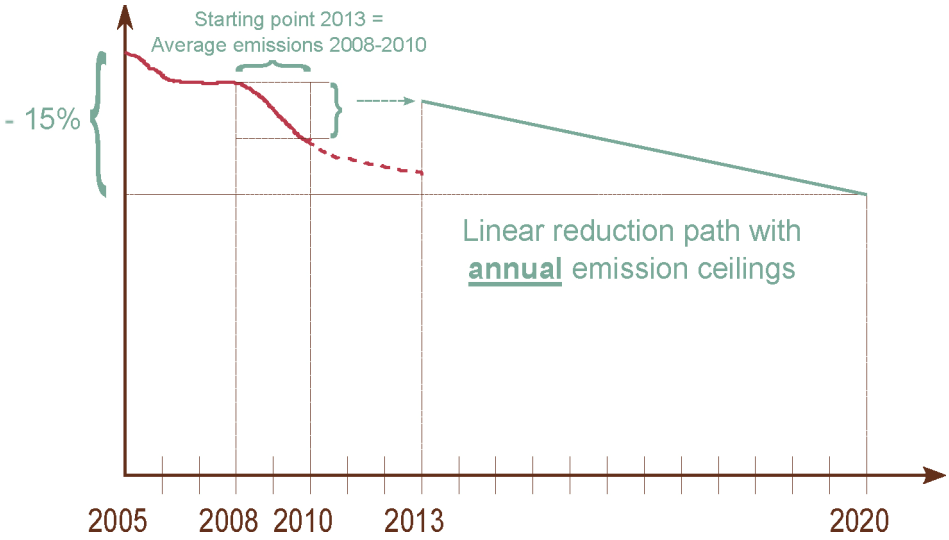

Figure 2. Linear reduction path 2013-2020 for Belgium according to the ESD (Decision 406/2009/EC)

The Belgian non-ETS target (-15%) has not yet been divided between the relevant Belgian governments (the regions and federal government). This effort sharing involves not only a sharing of the non-ETS target but stretches to a number of other aspects, such as a sharing of the targets for renewable energy, the sharing of revenues from auctioning emission allowances under the EU ETS, and a sharing of the (as yet unknown) Belgian contribution to international climate funding.

Given that the intra-Belgian effort sharing of the non-ETS target has yet to be finalised, the precise target for Flanders is not currently known. The Flemish Mitigation Plan 2013-2020 therefore bases the annual Flemish emission allocation on an (indicative) non-ETS reduction target of -15% for Flanders.

Square trees, Reinier Lagendijk
Beeldenstroom 2012 Photo Yves Adams

3. Flemish response to the reduction challenge

3.1 Starting points of the Flemish Mitigation Plan

The Flemish Mitigation Plan is a strategic policy plan containing measures in all relevant areas of Flemish policy and it ties in with the broader policies of the Government of Flanders.

Climate mitigation is a closely knit policy theme and the meeting of targets is therefore a shared responsibility of the Government of Flanders. The ministers for Environment, Energy, Mobility and Agriculture play a coordinating role, each in their own sector, in respect of other ministers with partial competencies in these sectors.

A successful climate policy calls for a societal transition towards an adapted and low-carbon economy, and requires an active effort from all players in society. Therefore the necessary consultation with stakeholders is organised when developing the mitigation policy.

To meet the international and European climate targets in good time, the priority is to implement every internal measure that is both technically and economically feasible and acceptable to society. Cost efficiency is an important factor when selecting policy measures. If necessary these internal measures will be complemented by emission allowances acquired from flexible mechanisms. Flanders will apply the international conditions with regard to sustainable development when acquiring these allowances.

It is extremely important that the mitigation policy should be closely monitored and that the efficacy of the package of measures is kept in line with the Flemish target. To facilitate efficient monitoring by the Government of Flanders, an annual progress report will be drawn up. The plan is considered to be a dynamic document or rolling plan, to be updated every year through these progress reports.

In the first place, the resources available within the budget for each of the policy areas are used to finance the measures. Additionally, the Flemish Climate Fund serves as a coordinating financial framework. This fund will mostly draw on revenues from the auction of European emission allowances under the EU ETS. The purchase of emission allowances, should internal measures prove insufficient to reach the target, falls within the budgetary responsibility of the Government of Flanders.

The Flemish Mitigation Plan was prepared at official level by the Flemish Mitigation Task Force (VTFM), which met under the chairmanship of the environment policy area. The VTFM has coordinated the Flemish Mitigation Plan's implementation since the plan was approved.

3.2 Sectoral information bookmarker

The sectoral chapters of the Flemish Mitigation Plan are structured around five components:

1. *Situation:* an overview of the main trends in each sector in the period 1990-2010.
2. *Measures:* an overview of measures already implemented (and continued in the period 2013-2020), planned (decision in principle taken by the Government of Flanders), adopted (official decision to implement) and/or proposed.
3. *Projections:* sectoral emissions projections, based, on the one hand, on current, approved policy (Business As Usual scenario, BAU), and based, on the other hand, on the estimated effects of proposed additional policy, with and without co-financing from the Flemish Climate Fund (Policy Scenario, BEL).
4. *Indicative reduction path and indicators:* on the basis of the results of the projections an indicative sectoral reduction path is mapped out for each sector, together with reduction paths for the subsectors with the largest share. These indicative sectoral reduction paths will be monitored by means of indicators designed to outline the policy effects of the measures.

5. *Outlook to 2050:* finally, there is an outlook to 2050 for each sector containing an initial evaluation of the European Commission's ambitious emission reduction paths for 2050. A number of paths and strategic choices designed to enable this transition are subsequently discussed. In the future they will be taken further as part of the Flemish Low Carbon Development Strategy.

In §3.3 to §3.10 inclusive, a brief summary is given of these sectoral chapters, along with a brief summary of transversal measures and the role of innovation in climate policy. This summary gives a general picture of Flemish climate change mitigation policy. A full list of measures is also appended. If you are interested in the specifics of certain measures, more information is available from klimaatplan@lne.vlaanderen.be.

3.3 Mobility

3.3.1 Situation

In 2010 the (non-ETS) transport sector was responsible for the emission of 16.1 Mton CO_2-eq or 32% of the total Flemish non-ETS greenhouse gas emissions. The largest share of this 16.1 Mton is from passenger road transport (45.5%), followed by freight road transport (34.5%). Inland waterway transport accounts for 3%. The fuel correction accounts for 17% of total greenhouse gas emissions in the transport sector. This correction arises from the difference between the emissions calculated using regional, bottom-up emission models and the emissions reported based on federal fuel sales figures for road transport (top-down). In the last five years the fuel correction has fluctuated at around 20% of road transport emissions. Prior to that, the fuel correction fluctuated at around 10% of road transport emissions. To account for this uncertainty, the calculations for the transport sector apply a fuel correction of 22% (surplus 2008) on the one hand, and there is also a variant that applies a correction of 13% (surplus 2005) on the other hand.

Total emissions in the transport sector reveal a rising trend in the period 1990-2010 (Figure 3). This rise is largely due to increased emissions in freight

road transport. In the period 2000-2010, we observe a total decoupling of emissions in passenger transport from passenger kilometres thanks to the increasing use of fuel efficient cars and of biofuels. Finally, we observe an appreciable rise in the correction for fuel sales, the reason for which is unclear.

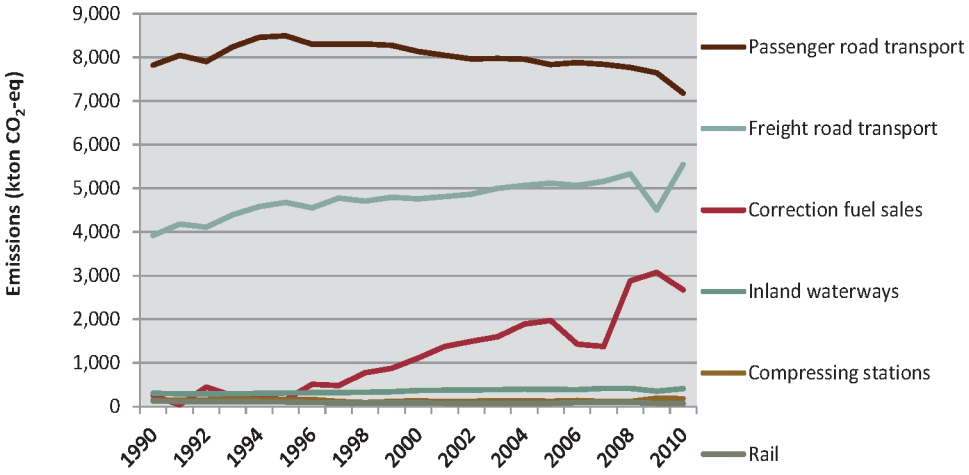

Figure 3. Greenhouse gas emissions for the transport sector 1990-2010

3.3.2 Measures

Due to its share in emissions, the measures focus on road transport (both cars and heavy goods vehicles). To reduce emissions in the transport sector Flanders will work to limit the number of vehicle kilometres by road, improve the environmental characteristics of the vehicle fleet and the fuels used, and encourage economical driving, including speed limit enforcement and infrastructure.

As regards the necessary limiting of the number of kilometers driven on the road, Flanders will work towards a very broad package of measures, further developed in the Flanders Mobility Plan, which is currently being drafted. The greatest reduction potential can be found in tangible road pricing approaches such as the introduction of a differentiated kilometre tax for

passenger and freight transport, in which the rates are sufficiently high. To this end, work is being undertaken to introduce by 2016 a differentiated kilometre tax for heavy goods vehicles and, associated with this, a trial project on the planned technical extendibility of the system to passenger vehicles. During this term of government (2009-2014) the 3 regions aim to set up a trial project for passenger vehicles aimed chiefly at behavioural effects. On the basis of the results of the trial projects, Flanders will assess in consultation with the other regions in the ensuing term of government (2014-2019) whether it is opportune to proceed as quickly as possible with the introduction of a differentiated kilometre tax for passenger vehicles, or alternative systems that are more appropriate to charge the costs of usage and the external costs to the users.

Additionally, Flanders will work towards alternatives to car possession and car travel by incentivising carpooling, car sharing, cycle sharing systems and teleworking; promotion of satellite offices; support of projects on sustainable mobility; modal shift in commuting traffic; development of cycling facilities, public transport and transfer points; and implementation of the STOP[1] principle paying particular attention to co-modality.

In the Flanders Land Logistics forums participants envisage optimisation of the logistic chain, improvement of manufacturer to consumer distribution (including last mile distribution), stimulation of initiatives for green logistics/return logistics and the retention and attraction of logistic activities with high added value. Incentives are planned for the use of inland waterways, and necessary measures have been taken such as those set out in the 3E Inland Navigation Action Plan (where 3E stands for ecological, economic and energy efficient) and the Flanders Mobility Plan, which is currently being drafted.

To ensure an improvement in the environmental characteristics of the vehicle fleet Flanders will work towards adequate taxation and financial instruments, communication, greening of the fleets (public transport, taxis, Government of Flanders), greening of the logistics sector via Flanders Land Logistics and encouragement of the use of alternative vehicles (electric and

[1] *As much Walking and Pedalling (cycling) as possible, then Public Transport and only then the private car.*

Numen/For Use, 2012
Begijnhof Hasselt, 10 years anniversary Z33 Photo Kristof Vrancken/Z33

natural gas) and fuels (electricity and biofuels). In conformance with the European White Paper on transport, Flanders will strive for a low carbon vehicle fleet in the longer term. This requires further reaching technological measures, such as a switch to electric vehicles.

To achieve the appropriate driving behaviour, Flanders will reform the driving licence test, basic driver training and refresher training, enforce speed limits, take circulation measures, and deploy and enforce optimum traffic circulation speeds.

Although the share of inland waterway transport in emissions is small, there are also measures for this sector. Improved efficiency in shipping will be achieved by, among other things, implementation of the 3E Inland Navigation Action Plan, development of a regulatory and logistic framework for Liquid Natural Gas, both for inland and sea navigation, further development of shorepower, development of a grant system for emission-reducing technologies (replacement of old engines and installation of speed and route advisory systems), and the encouragement (on an international scale) of the Environmental Ship Index (ESI) and the accompanying differentiated harbour dues.

The list of measures in the annex contains a more detailed list of the measures for road transport and inland waterway navigation.

Flanders must also look to use the opportunities offered by rail transport to a maximum extent. At present, Flanders however has no direct competences for rail transport, but its impact on the use of space, on environment (noise) and on mobility is very great. For passenger transport, the development of a high quality, integrated public transport system, with rail as its backbone, is indispensable in reducing the amount of car traffic. When it comes to freight transport the challenges are even greater: there is a need to improve access to the ports and set up sufficient, efficient transhipment points for rail, road and water. And when it comes to emissions, we need

to look into how continuous electrical traction can be encouraged on the major axes. The Government of Flanders seeks, on the basis of the Flemish rail strategy of February 2013, to enter into constructive dialogue with the federal government regarding its rail strategy and investment plans for passenger and freight transport.

3.3.3 Projections

The policy scenario anticipates that emissions due to passenger transport will continue to drop to -23% in 2020 compared to 2005 and that emissions due to freight transport will rise by 15% (Figure 4). For the transport sector as a whole (subject to a fuel correction of 22%) a slight decrease of 1.5% is anticipated for the period 2005-2020. The variant involving a fuel correction of 13% shows a bigger decrease of 8.5% in the period 2005-2020. The other modes of transport (mostly rail and inland waterways) represent a small share of overall emissions (about 3%) and the emission levels in 2005 and 2020 are expected to be very similar (504 and 507 kton CO_2-eq respectively).

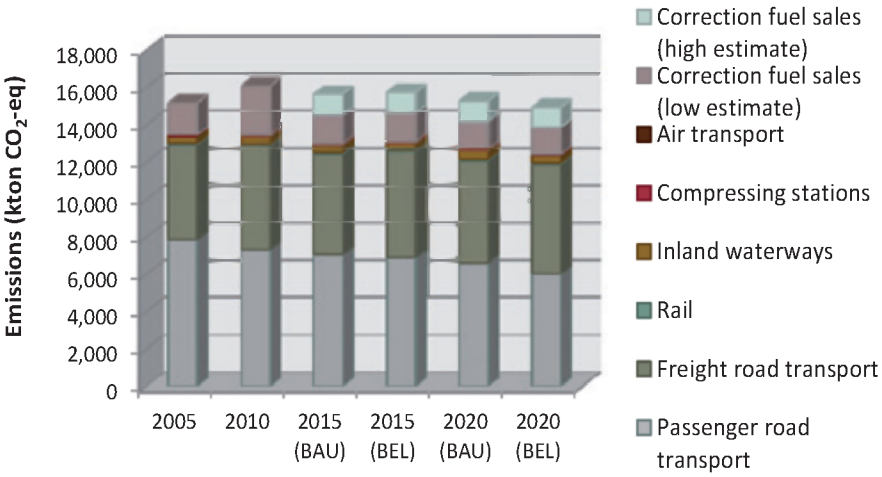

Figure 4. Summary of BAU and BEL emissions in mobility sector for 2005-2020

3.3.4 Outlook to 2050

Changing mobility behaviour in the long term requires fundamental changes in society related to economy, technology and spatial planning. Under §3.3.2 a number of measures were indicated that will be important to this transition. In addition, the environment policy area will work towards a heightened sense of responsibility among the various policy areas of the Government of Flanders, enabling the climate targets to be considered more explicitly and to be incorporated when strategic choices are made that will cause added traffic streams. Flanders also envisages a well-conceived spatial policy that reduces the demand for mobility, and aims to encourage the breakthrough of new, climate-friendly technologies.

3.4 Buildings

3.4.1 Situation

In 2010 the buildings sector was responsible for the emission of 18.9 Mton CO_2-eq or 38% of the overall Flemish non-ETS greenhouse gas emissions. Greenhouse gas emissions from buildings predominantly relate to the heating of spaces and the production of hot water for sanitation in both residential and tertiary buildings. To account for the climatological conditions affecting the need for heating, a climate correction was applied to the emissions (Figure 5) before any conclusions were drawn about the trend they follow. Despite the growth of the population and a decline in the size of households, it seems that the overall greenhouse gas emissions from buildings have stabilised in recent years, thanks to the increasing energy efficiency of buildings in general and to the switch from heating oil to natural gas.

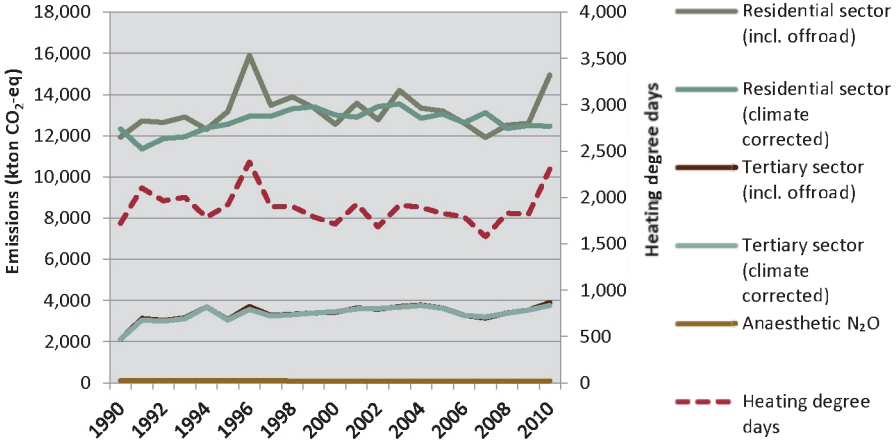

Figure 5. Greenhouse gas emissions for the buildings sector 1990-2010

3.4.2 Measures

Existing and new measures of the Government of Flanders will limit emissions of greenhouse gases. As regards regulations, Flanders is in general working towards a gradual tightening of the energy performance and indoor climate requirements for newbuilds and full renovations towards virtually energy-neutral buildings in 2021. Specific energy performance and indoor climate requirements will be a precondition for positive recommendation from the government in social housing construction and project financing in the care sector. In addition, the Flemish Housing Code (which every home in Flanders is required to satisfy) will impose minimal energy performance requirements and an energy correction will be incorporated in social housing rents. In addition, the energy performance certificate required when renting or selling a property will be further developed and extended, and the deployment of a framework for full energy audits will be continued. Additional policy is planned to improve the maintenance of central heating boilers and to encourage the replacement of old boilers through a tightening and improved fulfilment of the audit obligation.

Targeted communication will continue to provide information and raise awareness about the rational use of energy and environment-friendly energy production in the coming years. At present, energy consultants receiving government support are assigned to a range of target groups (construction professionals, families, SMEs, owners of heritage buildings, operators of tourism businesses and accommodations, farmers) and resources have been set aside for demonstration projects in social housing construction and school building. An action plan on micro-combined heat and power systems (CHP) is also being prepared.

Energy-efficient newbuild and renovation projects are supported through various financial tools. Important financial incentives are given through the public service obligations concerning rational use of energy for electricity distribution network operators. They have a number of service obligations - including issuing of grants - to encourage their end-users to save energy, and in this they are required to pay special attention to disadvantaged social groups. Higher grants are provided for combined insulation projects.

On top of the grants from the network operators a renovation grant is awarded for certain energy-related investments. In addition, the property tax for energy efficient newbuilds is automatically lowered if the newbuild outperforms the prevailing requirements. The Government of Flanders is also looking into the possibilities of providing extra incentives to demolish homes with a very poor energy performance, replacing them with new-builds.
In social housing, additional grants are provided on top of those from the network operators, with higher grants being awarded for full renovations. In the education sector all new projects have to satisfy the energy performance requirements and there is an allowance for switching to these stricter energy requirements. Via alternative financing, investments in newbuild/ renovation projects are being accelerated. Additionally, grants are provided for the rational use of energy in existing schools.

The Flemish Energy Enterprise that was set up in 2012 aims at, among other things, implementing energy saving measures in government buildings by offering and coordinating energy services. Pursuant to Directive 2012/27/EU, 3% of the floor area in Government of Flanders buildings must be renovated from an energy viewpoint each year, starting from 1 January 2014.

3.4.3 Projections

Overall, Flanders anticipates a 23% emission reduction in the policy scenario between 2005 and 2020 in the buildings sector as a whole (Figure 6). The drop in emissions is greater for residential buildings (-27%) than for tertiary buildings (-11%).

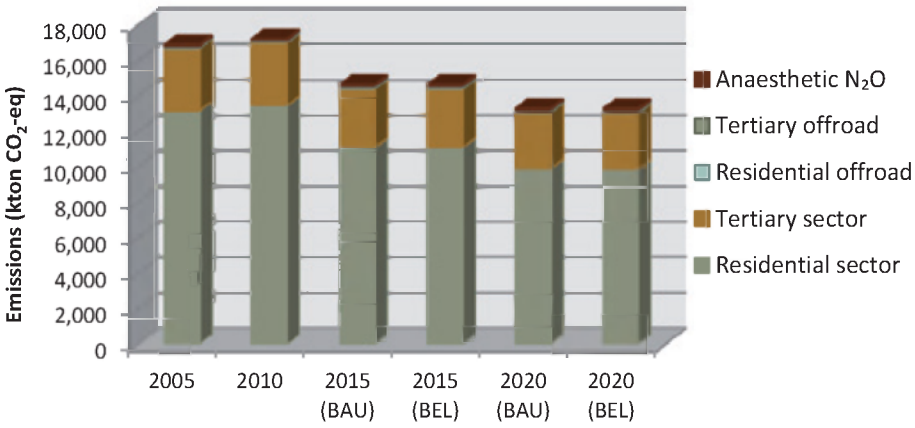

Figure 6. Overview of BAU and BEL emissions in the buildings sector 2005-2020

3.4.4 Outlook to 2050

Emissions from the buildings sector will reduce in the years to come, but the sector will retain a significant share of the overall non-ETS emissions. Consequently, after 2020 there will still be a large emission reduction

potential in this sector, and the current pace of renovation will not be enough to fulfil this potential. Additional efforts will be needed to replace and improve poorly performing buildings and it will remain very important to prepare additional, cost-efficient measures for the sector. In this respect, preference is given to the integrated approach of a dwelling's energy efficiency and its general liveability, paying special attention to those most in need of housing and the vulnerable/hard to reach target groups (such as the elderly, etc.). The further development of the (short- and) long-term policy for the sector will pay special attention to the development of policy relating to the split incentives affecting tenants and landlords in the rental market. The smart use of space, creative housing solutions and spatial planning for good housing also deserve attention.
Additionally, the greater energy efficiency of the buildings portfolio will yield added socio-economic benefits (reduction of energy bills for citizens, institutions and businesses) and environmental benefits (reduction of other air pollutants).

3.5 Agriculture

3.5.1 Situation

In 2010 the agricultural sector was responsible for the emission of 7.5 Mton CO_2-eq or 15% of the overall Flemish non-ETS greenhouse gas emissions. Greenhouse gas emissions in the agricultural sector consist of energy-related emissions on the one hand, and enteric fermentation, manure management and soil emissions on the other (non-energy related emissions) (Figure 7). The trend in energy related emissions was downward until 2008. Since 2008, increasing numbers of private combined heat and power systems have been set up in the agricultural sector, causing a net shift in natural gas usage in the greenhouse gas inventory from the electricity and heating sector to the agricultural sector. The driver behind non-energy related emissions (circa 75% of agricultural emissions) is the number of livestock. Between 2000 and 2008 these emissions dropped along with livestock

numbers. Since then, however, the new manure policy has enabled livestock numbers to grow again and the sector's non-energy-related emissions have increased once more.

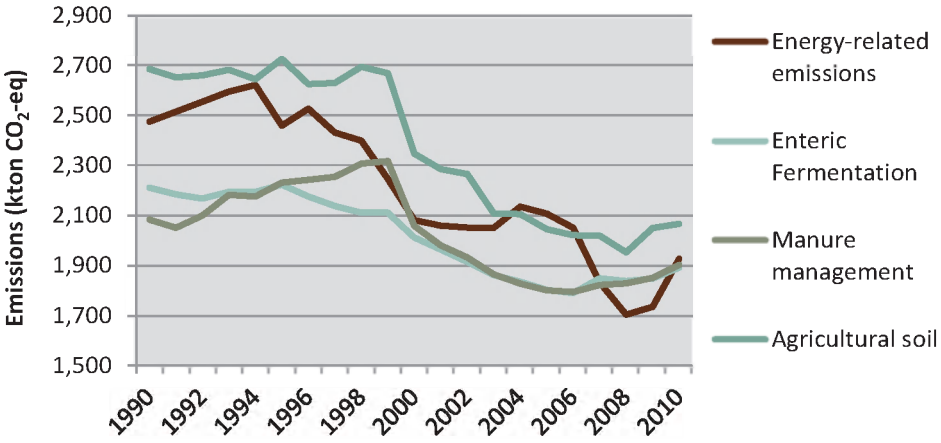

Figure 7. Greenhouse gas emissions in agricultural sector 1990-2010

3.5.2 Measures

In general, the agricultural sector will work towards further improving its sustainability through among other things improved information and awareness-raising, paying special attention to less efficient businesses and small-scale operations. In the coming years, current Flemish climate policy instruments will be tested against and harmonised with the reviewed Common European Agricultural Policy. In the process a study on the expansion and/or strengthening of the current Flemish policy's set of instruments will be carried out, aiming for example at a greater use of innovative prototypes. Measurement instruments for greenhouse gases, greenhouse gas emission reduction techniques, and rational energy and renewable energy use in the Flemish agricultural and horticultural sectors will be researched.

Various policy instruments will continue to stimulate energy saving and sustainable and renewable energy production and consumption. These include financial support for energy saving techniques and investments in renewable energy, advice on the rational use of energy in permits, awareness raising, technological services, etc. Additionally, the energy consultant project will be strengthened and a pilot project will be supported in which low value residual heat from waste incinerators is used to heat (and possibly CO_2-fertilise) clustered greenhouses.

A number of actions are proposed to further reduce methane (CH_4) and nitrous oxide (N_2O) emissions. Flanders will focus on further research and implementation of nutritional strategies, the composition of feed, good manure management practices, awareness-raising and (the provision of) information. Flanders will also work towards the small-scale anaerobic fermentation of pure manure by giving financial support for small scaled fermenters.

Various plans and strategies focus on consumer behaviour - which can have a major, indirect impact on the climate by making particular choices for food - and on improving the sustainability of the entire food chain. These include the Short Supply Chain Strategic Plan, the Organic Agriculture Strategic Plan, awareness-raising for a more sustainable diet and various projects designed to counter food loss and waste, and to maximise the use of biowaste and organic byproducts.

3.5.3 Projections

Overall, the policy scenario anticipates a slight 1% rise in emissions for the agricultural sector as a whole between 2005 and 2020 (Figure 8).

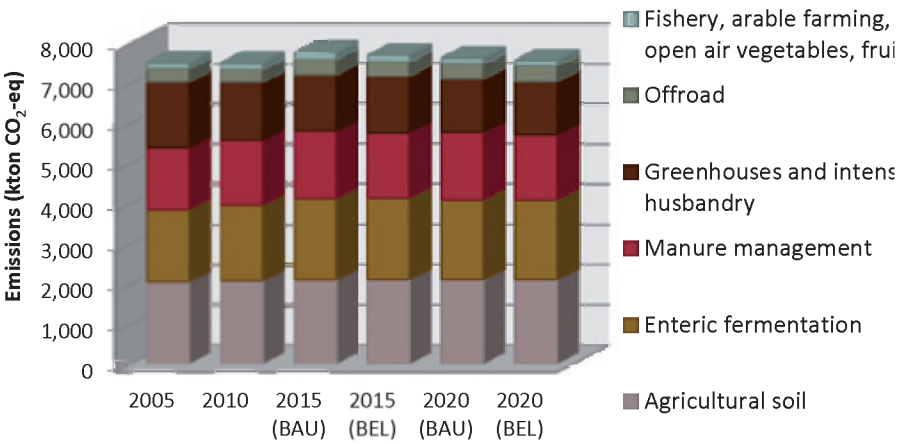

Figure 8. Overview of BAU and BEL emissions for the agricultural sector 2005-2020

3.5.4 Outlook to 2050

Long-term policy in the agricultural sector is implemented using the same coordinating instruments that are used today. New developments affecting the Common European Agricultural Policy will probably offer further opportunities to reduce emissions in this sector. These developments will be closely monitored. New findings from research – to which Flanders is dedicated – could lead to the introduction of new measures using these instruments. New reduction measures will largely have to address non-energy related agricultural emissions.

3.6 Non-ETS industry

3.6.1 Situation

In 2010 the non-ETS industry sector was responsible for the emission of 5.4 Mton CO_2-eq or 11% of the overall Flemish non-ETS greenhouse gas emissions. The changing scope of the EU-ETS, the short trading periods to date and the aggregated figures for the ETS and non-ETS industry make it

difficult at present to spot specific, clear trends in relation to the historical emissions of the non-ETS industry.

After a considerable increase in emissions in the 1990s (Figure 9), the trend for industry as a whole (ETS and non-ETS) has been downward for both process and energy-related greenhouse gas emissions measured since 2004-2005. In 2008 and 2009, emissions were clearly affected by the economic crisis.

Energy usage (and the resulting emissions) in industry (ETS + non-ETS) have been independent of economic growth since 1998. The energy intensity of the sector has decreased due to improved energy efficiency and a shift towards less energy intensive products. Overall, a clear, absolute reduction in energy-related emissions has not yet been observed.

In 2010, 58% of the greenhouse gases from the non-ETS industry came from energy-related emissions. The F-gases accounted for 23% of the sector's emissions. Process emissions and fugitive emissions from fuels accounted for the remaining 19%.

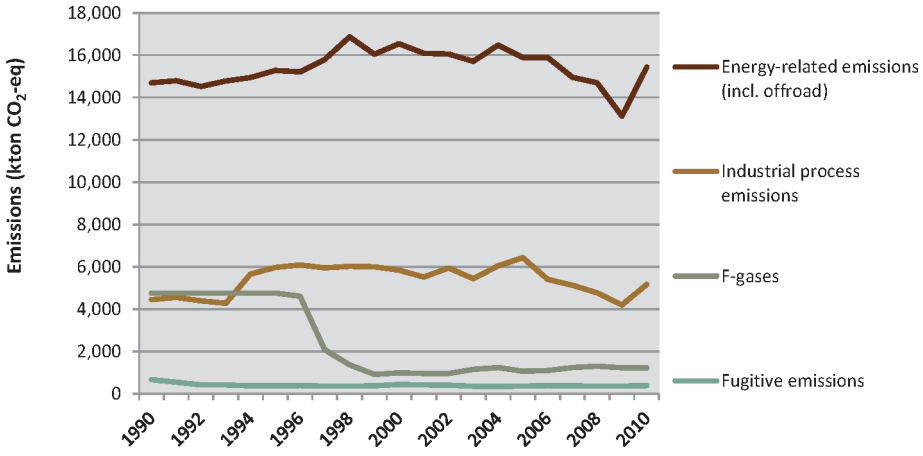

Figure 9. Greenhouse gas emissions in the industry sector 1990-2010

3.6.2 Measures

The existing Energy Planning Decision and the energy policy agreement provide the main regulatory framework for energy-related emissions. The Energy Planning Decision imposes energy-efficiency requirements on establishments with a total annual primary energy consumption of at least 0.1 PJ. The energy policy agreement, to which companies can sign up voluntarily, builds on the obligations of the Energy Planning Decision. Flanders also deploys a number of flanking policy instruments: the Government of Flanders encourages companies to invest in green high technology, offering them a financial compensation by means of the ecology premium and strategic ecology support; businesses can use the green guarantee for energy saving investments, a system offering better conditions than the generic guarantee scheme; an SME energy-efficiency plan is being worked out and Flanders continues to invest in CO_2-neutrality and sustainability in the development of industrial estates. A support mechanism based on a call system will stimulate the production of green heat and the use of residual heat. A market mechanism using combined heat and power (CHP) certificates guarantees a stable investment climate for CHP.

Tranendeef, Dré Wapenaar, 2012
Pit -Art in public space, Borgloon Photo Kristof Vrancken/Z33

In addition, the development of heat distribution systems that are both technically and economically sound will be stimulated.
To reduce process-related N_2O emissions in the caprolactam industry, additional measures will be identified and put in place.

The policy on F-gas emissions will be continued by means of leak protection requirements, certification requirements for refrigeration companies and their personnel, and inspection campaigns. Additional action points will be introduced to reduce these emissions by increasing the average leak protection on refrigeration installations and by reducing the use of refrigerants with a high global warming potential. To this end an action plan will be set up to cover training, awareness-raising, control, regulation and knowledge gathering. The use of climate friendly refrigerants will also be encouraged.

3.6.3 Projections

Overall, the policy scenario for the non-ETS industry sector anticipates a 46% increase in greenhouse gas emissions in the period 2005-2020 (Figure 10). This rise is explained by a considerable rise in energy-related emissions (+34%), industrial process emissions (+66%) and F-gas emissions (+73%).

There is however a high degree of uncertainty regarding the energy-related emissions in the reference year 2005. The 2010 inventory year offers a more reliable point of reference. The policy scenario anticipates a small 2% rise in emissions in the non-ETS industry in the period 2010-2020. A 13% fall in energy-related emissions is expected over the period 2010-2020. Taking into account the expected average economic growth +15% over this period, a decoupling of economic growth from energy-related emissions is anticipated.

The increase in industrial process emissions (by 66% compared to 2005 in the BEL scenario) results from the increase in N_2O emissions from caprolactam production in the period 2005-2010 (due to the combination

of a production increase and process changes). The projections for process-related N_2O emissions take into account a decrease in N_2O emissions per ton of caprolactam, thanks to process optimisation after 2012. In the BAU scenario, however, emissions continue to increase due to a planned increase in the production of caprolactam as from 2016. Taking into account the proposed policy, the policy scenario provides for at least a stabilisation of these emissions at the 2015 level. Additional policy measures should confine the additional emissions due to the rise in production to a minimum.

The increase (+73%) in F-gas emissions between 2005 and 2020 is largely due to an increase in the use of hydro fluorocarbons (HFCs) as a coolant in refrigeration and freezing applications resulting from the on-going phase-out of ozone depleting HCFCs in these sectors. Overall, the replacement of HCFC by HFCs actually has a positive effect on climate change, HCFCs also being greenhouse gases. However, HCFCs are already regulated by the Montreal Protocol (protection of the ozone layer) and subsequently they are no longer included in the greenhouse gas emission inventory (whereas the F-gases are). In the policy scenario, an emission reduction will be achieved as from 2016 by increasing the average leak protection on refrigeration installations.

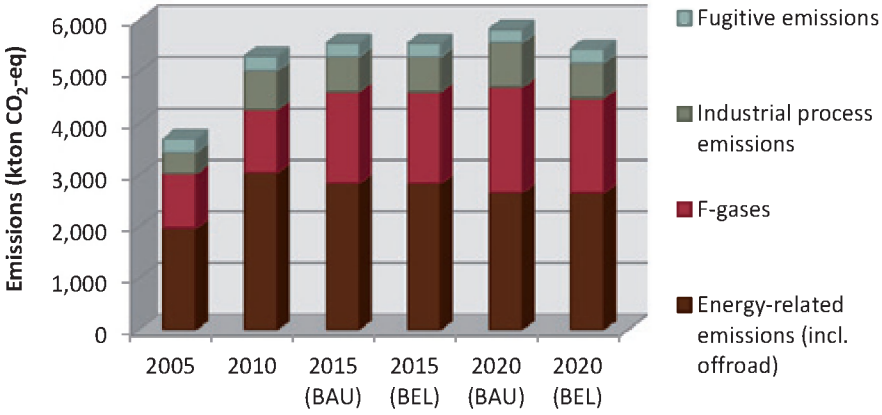

Figure 10. Overview of BAU and BEL emissions in non-ETS industry sector 2005-2020

3.6.4 Outlook to 2050

The projections for the non-ETS industry in 2020 indicate that additional measures will have to be put in place to reach the targets for 2050.
In the case of energy-related greenhouse gas emissions Flanders will continue to work towards higher energy and greenhouse gas efficiency that should decouple economic growth from energy consumption in the sector.
In addition to measures relating to energy efficiency, measures will also have to be developed for the sector's ca. 40% non-energy related greenhouse gas emissions. In consultation with the parties involved, a number of specific measures will be worked out to cope with the huge diversity in the sector. In the long term it will be necessary to completely stop the use of F-gases, particularly in applications that are vulnerable to leakage, such as refrigeration installations, which account for the largest emission of F-gases. Because technology in the area of climate friendly refrigeration applications is developing with lightning speed, HFC-free refrigeration should be standard technology by 2050. The use of F-gases will need to be confined to specific applications for which there are no viable alternatives for technical or economic reasons. The effects of climate change (implying a greater need for refrigeration) can only reinforce the need for this evolution.

3.7 Non-ETS energy

3.7.1 Situation

In 2010, the non-ETS energy sector was responsible for the emission of just 0.2 Mton CO_2-eq or 0.3% of total Flemish non-ETS greenhouse gas emissions. The greenhouse gas emissions from the non-ETS section of the energy sector are confined to the CH_4 and N_2O emissions in the energy sector and the greenhouse gas emissions from non-ETS combined heat and power systems (CHP) in cooperation with the energy sector. In recent years an increasing number of CHP units have been started up privately and the net result has been a shift of natural gas consumption from the energy sector to other sectors. This is because greenhouse gas emissions from

non-ETS self-producers are assigned to the sectors in which these systems operate, which explains the 67% decrease in CHP emissions between 2005 and 2010.

3.7.2 Measures

Account taken of this trend, the measures designed to stimulate CHP and green heating are included under the sector in which the greatest impact is anticipated. The policy measures designed to drive up green power generation do not directly affect the non-ETS sector. This is because the (reduced) emissions in the electricity sector are included in the EU ETS.

3.7.3 Projections

CH_4 and N_2O emissions increase in line with the anticipated rise in electricity generation (Figure 11). For the coming years an increase proportional to the global increase in CHP emissions is estimated. However, CHP emissions fell between 2005 and 2010 - largely due to a decline in the number of CHPs cooperating with the energy sector - as a result of which the sector's greenhouse gas emissions are expected to decrease by 28% between 2005 and 2020 in the BAU scenario.

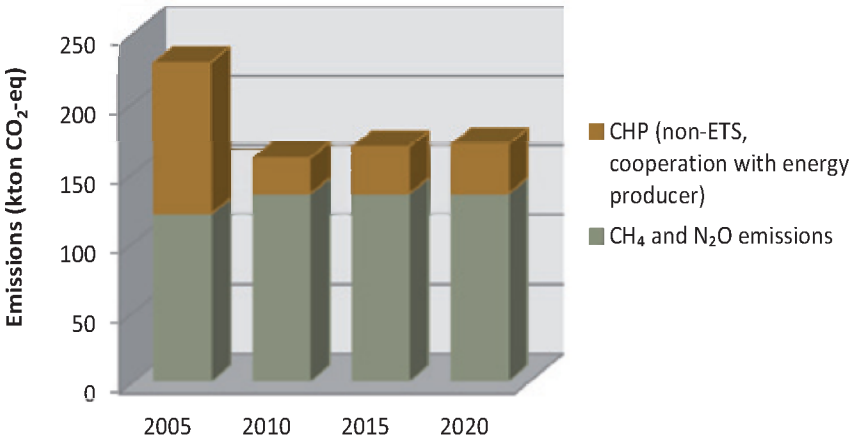

Figure 11. Overview of BAU emissions in the non-ETS energy sector 2005-2020

3.8 Waste

3.8.1 Situation

In 2010 the waste sector was responsible for the emission of 1.7 Mton CO_2-eq or 4% of the total Flemish non-ETS greenhouse gas emissions in 2010. The greenhouse gas emissions attributed to the waste sector are caused by the disposal, composting and incineration of waste and by the treatment of effluent in sewage purification plants (Figure 12). Over the period 1990-2010 greenhouse gas emissions from waste incineration plants increased by 58%. Waste incineration capacity has increased because landfill disposal has been drastically curtailed under the wasted processing hierarchy. CH_4 emissions from landfill sites have decreased by 83% over the same period. This decrease is the most important factor in the 36% decrease in emissions in the waste sector over the period 1990-2010.

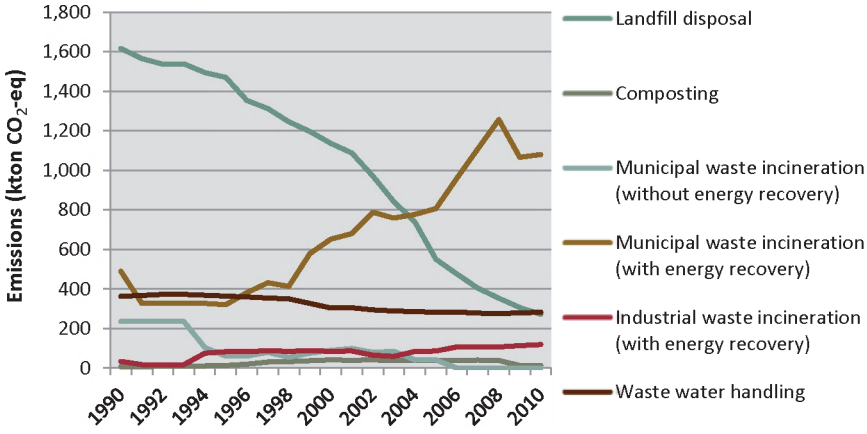

Figure 12. Greenhouse gas emissions for waste sector 1990-2010

3.8.2 Measures

In the coming years Flanders will continue to work towards an evaluation and adjustment of existing policy instruments, greater reuse and recycling as part of the sustainable materials policy, and improvement of energy recovery in waste incineration plants. For composting, the possibility to pre-ferment household organic waste will be examined. When combined with valorisation of the biogas, this could lead to a slight reduction in greenhouse gases.

3.8.3 Projections

In the BAU scenario, emissions in the waste sector are expected to decrease over the period 2005-2020 (Figure 13). This is largely due to the further anticipated reduction in landfill emissions to 80% of 2005 levels by 2020.

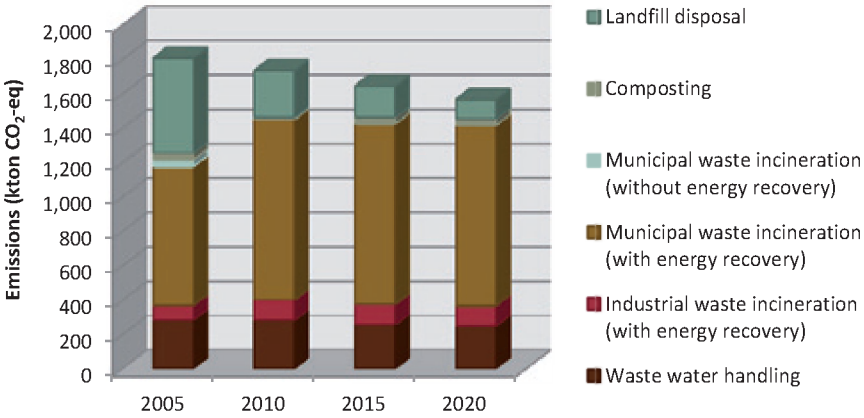

Figure 13. Overview of emissions for the waste sector 2005-2020

3.8.4 Outlook to 2050

Up to 2050 the greatest potential lies in strengthening the waste reduction policy through:

- closing material circuits (cradle-to-cradle), as well as preventing leaks from these circuits;
- greater use of waste streams as raw materials;
- improving the quality of products and production processes, thereby reducing waste quantities.

3.9 Transversal measures

Some of the policy measures are transversal and have an effect on several non-ETS sectors. The first of these is that of making the Government of Flanders more climate friendly, with the emphasis on government buildings, vehicle fleets and mobility, and improving the sustainability aspects of government contracts. The Government of Flanders supports local authorities from a number of perspectives in designing their climate policies. Other measures involve emphasising climate in environmental education and setting up an integrated awareness-raising campaign. Harmonisation with other policy plans - such as the Flemish action plan for virtually energy neutral buildings, the Flemish Action Plan for Energy-Efficiency, the Flanders Housing Policy Plan (under preparation), the Flanders Mobility Plan (under preparation) and the Flanders Spatial Policy Plan (under preparation) - is being improved, and the climate theme is being integrated into instruments used in support of decisions. In addition, the knowledge base and range of instruments for climate policy are being expanded.

3.10 Research and innovation

Partially due to placing climate change on the agenda, attention has focused on the greening of the economy in recent years. A few separate initiatives are not enough to achieve this and what is needed is a cohesive innovation

policy which, in addition to incremental and technological innovation, seeks innovation at systemic level. In this way individual initiatives can lead to a better overall result.

The main challenge in the mitigation of climate change is the transition to low carbon systems for production and consumption, while keeping the social and economic costs involved to a minimum and maximising the social and economic benefits. This transition will not be achieved if the government does not create the right framework. Essentially, this means creating the right incentives to enable businesses and enterprises to invest in innovation and the use of low carbon technologies, processes and systems.

For every stage in the innovation process, there are programmes and funds in Flanders capable of lending support for projects. Climate policy, among others challenges, results in new innovation needs. The aim of the Government of Flanders' concept paper "Innovation Centre Flanders" is to lend direction to targeted innovation policy with a focus on the major social and economic challenges. The horizontal theme of innovation is intended to make a specific contribution to the Flemish approach to these challenges and maximise the economic opportunities. The concept paper defines six innovation junctions (transformation through innovation, eco-innovation, green energy, care, sustainable mobility and logistics, social innovation) linking the scientific and technological strengths of Flanders with the major social and economic challenges.

For each of these innovation junctions, Innovation Steering Groups (ISGs) have been set in the framework of the Flemish Council for Science and Innovation (VRWI) to map out a strategic innovation agenda for the medium term and strengthen Flemish innovation policy. The innovation agendas and related VRWI recommendations of the ISG Green Energy, the ISG Construction and the ISG Eco-innovation show which innovations are required for a low carbon society and what needs to be done.

The financing of science policy in Flanders, combined with the concept paper "Innovation Centre Flanders", creates opportunities to stimulate research and innovation in areas such as climate change. The aim is also to improve the framework of financial tools and simplify the legal framework.

Masterclass with Ingo Giezendanner, 10 years anniversary Z33
Photo Kristof Vrancken / Z33

Gijs Van Vaerenbergh, Reading between the Lines, 2012
Pit -Art in public space, Borgloon Photo Kristof Vrancken/Z33

4. Other climate-related policy

The Flemish Mitigation Plan focuses on the internal Flemish climate policy that contributes to the Flemish emission reduction target for the non-ETS sectors. In addition, there are other climate-related policies that do not contribute to this target, even though they do serve to combat climate change. They include:

- The European Union's Emission Trading System (EU ETS) for energy intensive industries;
- The Flemish Renewable Energy Action Plan; and
- Policy development in the areas of Land Use, Land Use Change and Forestry (LULUCF).

5. Impact of the policy proposals

Figure 14 and Table 1 give a summary of the results of the policy scenario involving current policy and approved policy proposals (BAU scenario) and of the policy scenario involving the extra policy proposals (BEL scenario) for all non-ETS sectors. The results for the variation with a lower fuel correction are also given.

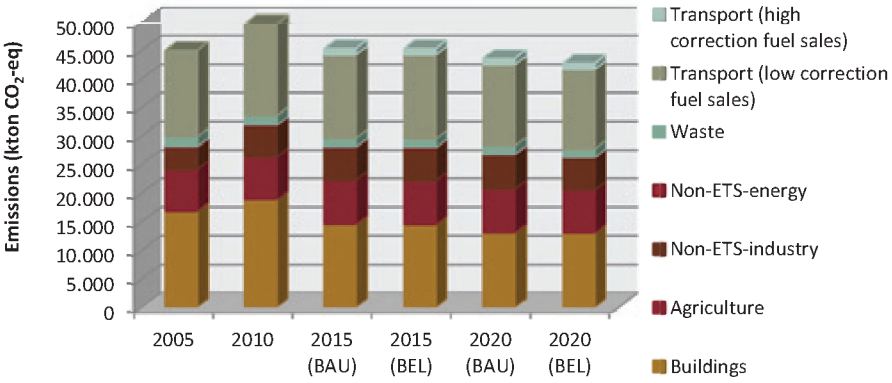

Figure 14. Results for BAU and BEL scenario (emissions inventory for 2005 and 2010, projections results for target years 2015 and 2020)

	2005	2010	2015 (BAU)	2015 (BAU) - Variant	2015 (BEL)	2015 (BEL) - Variant	2020	2020 (BAU) - Variant	2020 (BEL)	2020 (BEL) - Variant
Buildings	16,885	18,894	14,548	14,548	14,504	14,504	13,128	13,128	13,056	13,056
Transport	15,178	16,090	15,652	14,531	15,752	14,632	15,278	14,187	14,951	13,893
Agriculture	7,506	7,500	7,758	7,758	7,695	7,695	7,626	7,626	7,560	7,560
Industry	3,711	5,312	5,559	5,559	5,558	5,558	5,833	5,833	5,441	5,441
Waste	1,806	1,740	1,649	1,649	1,649	1,649	1,571	1,571	1,571	1,571
Energy	230	155	163	163	163	163	165	165	165	165
Total Non-ETS	45,316	49,691	45,330	44,209	45,317	44,197	43,600	42,510	42,732	41,675

Table 1. Results for BAU and BEL scenarios (kton CO_2-eq, emissions inventory for 2005 and 2010, projections results for target years 2015 and 2020) (Variant stands for working hypothesis with low fuel correction)

These results were tested against the Flemish reduction path for the period 2013-2020[2]. The calculation of the non-ETS target is based on the -15% target set for Belgium in the Effort Sharing Decision (ESD). Because the actual Flemish target is yet to be established under an intra-Belgian effort sharing process (§2), the Flemish non-ETS target referred to here is merely hypothetical and indicative.

On the whole, in a -15% scenario in Flanders a cumulative emission gap of 12 Mton CO_2-eq can be anticipated in the period 2013-2020 based on the BAU scenario (Figure 15). The BAU scenario variant using a lower fuel sales correction gives a cumulative emission gap of 3 MtonCO_2-eq in the period 2013-2020.

[2] Projections are only available for the target years 2015 and 2020. The figures are interpolated for the intervening years (2013-2014 and 2016-2019).

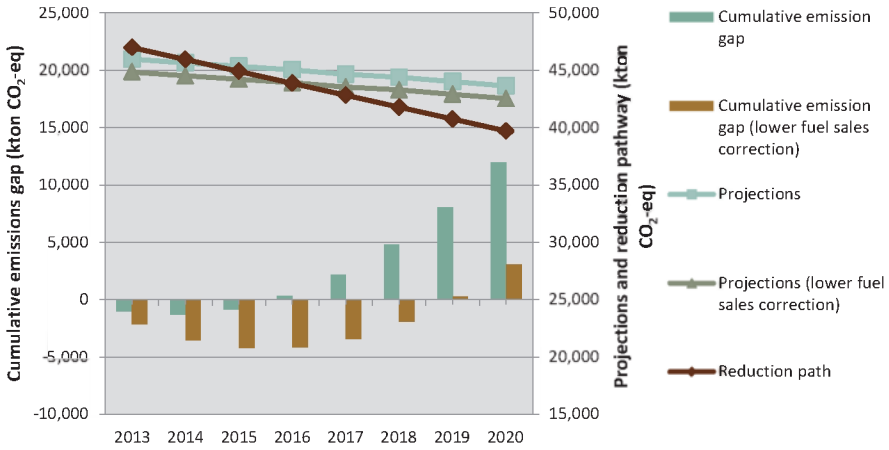

Figure 15. Result for BAU scenario with -15% reduction path in the period 2013-2020 (kton CO2-eq)

The additional proposed policy for the various non-ETS sectors requiring no extra budgetary resources from the Flemish Climate Fund result overall in an added reduction potential of 2 Mton CO_2-eq in the period 2013-2020. Additional measures in the short term (2013-2014) that are co-financed by the Flemish Climate Fund give an additional reduction potential of 1 Mton CO_2-eq in this period.

Overall, in a -15% scenario in Flanders a cumulative emission gap of 9 Mton CO_2-eq can therefore be anticipated in the period 2013-2020 based on the BEL scenario (Figure 16). The BEL scenario variant using a lower fuel sales correction gives a cumulative emission gap of maximum 1 Mton CO_2-eq in the period 2013-2020.

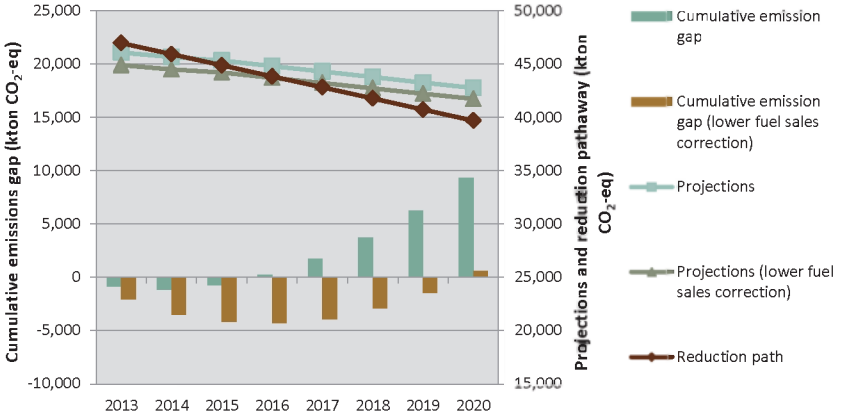

Figure 16. Result of BEL scenario with -15% reduction path in the period 2013-2020 (kton CO_2-eq)

The interpretation of the results from the BAU and BEL scenarios must take into account a number of uncertainties that are inherent to the structure of the projections. This refers to exogenous assumptions in the various sectors (economic growth, fuel prices, population trend, heating degree days, etc.):

- The main exogenous variable lies in the buildings sector and relates to the heating degree days (warm or cold winter) that could have an impact on the cumulative reduction gap in the period 2013-2020 of + 8.6 Mton CO_2-eq or - 4.9 Mton CO_2-eq in a scenario with 2,308 (2010) or 1,538 (2011) heating degree days respectively, compared with the 1,799 heating degree day scenario (standard).
- A variation in annual anticipated economic growth of + 1% or - 1% results in an impact on the cumulative reduction gap in the period 2013-2020, particularly on energy-related emissions in the non-ETS- industry and in the tertiary sector, of + 1.9 or - 1.8 Mton CO_2-eq respectively.
- In the transport sector the main exogenous factors are population growth (for passenger transport) and economic growth (for freight transport by road). An additional 3% increase in population growth and 0.3% annual economic growth results in an impact on the cumulated reduction gap in the period 2013-2020 of + 2.2 Mton CO_2-eq.

In addition, some of the policy assumptions for the various sectors also involve a number of variables, primarily the fuel sales correction factor.

An annual progress report monitoring the implementation of the measures and the reductions achieved should allow systematic monitoring of the progress made, allowing remedial measures to be taken wherever necessary. The plan is considered to be a living document or rolling plan, to be updated every year through these progress reports.

6. Introduction of flexibility mechanisms

One of the starting points in the present plan is that the Government of Flanders will take every internal measure that is both technically and economically feasible and acceptable to society.

As we have seen from the above, the internal measures included in the present plan (already planned and additional proposals) will not suffice to achieve the proposed reduction path in the period 2013-2020. Moreover, financial resources are currently not available to finance all the newly proposed measures in the short term. Hence, at the present time, it is certainly necessary to take initiatives to acquire emission allowances from flexible mechanisms.

The ESD states the annual emission allocations at the disposal of the European Member States for non-ETS sectors in the period 2013-2020. Besides the initial annual emission allocation, the decision also covers the various forms of flexibility available to Member States to reach their targets: banking (saving emission allocations for the next year); borrowing (borrowing emission allocations from a future year); trading annual emission allocations (AEAs) with other Member States; and using credits from project activities (from the clean development mechanism (CDM) and joint implementation (JI) projects).

On the basis of the non-ETS projection figures in the BEL scenario and a (purely indicative) Flemish target of -15%, the emission allocation gap for Flanders in the period 2013-2020 would be 9 Mton CO_2-eq. To make up for the shortfall in its emission allocation Flanders will not automatically take up the option of borrowing against its emission allocation for the following year, but will carry out an active purchasing strategy with a view to acquiring additional emission allowances. Given that the gap in emission allocation continues and increases towards the end of the period, the borrowing of emission allocation comes down to shifting the emission deficit to the end of the period. Although the ESD does not prescribe the practice, the Flemish Region will not, for reasons of sustainability, acquire allowances from project categories from which ETS industries are excluded for the trading period 2013-2020. In addition, the Flemish Region also chooses not to make use of credit from a number of other, less sustainable project types. More particularly, the following credits are ruled out:

- Certified emission reductions (CERs) and emission reduction units (ERUs) from projects involving trifluoromethane (HFC-23) destruction, because they generate considerable "windfall profits" and complicate the phase-out of ozone depleting substances;
- CERs and ERUs from projects involving the destruction of N_2O from the production of adipic acid, for similar reasons;
- CERs and ERUs generated by nuclear installations;
- CERs and ERUs from land use, land use change and forestry;
- CERs and ERUs from projects involving the destruction of N_2O from the production of nitric acid;
- CERs and ERUs from large hydroelectric power projects (>20 MW);
- CERs and ERUs from projects to improve the energy efficiency of coal-fired power plants;
- ERUs from JI track I projects.

For the 2013-2020 commitment period, purchases from the same host country are limited to 40% of the total acquisition volume for that period.

There are several possible pathways for the further acquisition of emission allowances in the period 2013-2020: a tender put out to the primary carbon market, a tender put out to the secondary carbon market and purchase via climate funds, largely on the primary market. In the period 2013-2014 specifically, the following initiatives will be taken:

- prospection of the potential for Flemish industries that qualify to participate in CDM projects abroad;
- purchase of CERs and ERUs on the secondary market to set up an initial buffer in the early years of the period 2013-2020.

7. Funding

The majority of the climate measures are financed by the policy areas that are responsible for the measures in question. In the period 2013-2020, the relevant policy areas will set aside an estimated EUR 1,200 million for planned and accepted internal climate policies (excluding personnel costs).

In addition, the Government of Flanders decided on 27 April 2012 to set up the Flemish Climate Fund to provide a financial framework for its ambitious long term climate policy. This Climate Fund will mostly draw on revenues from the auction of emission allowances under the EU ETS. These revenues can be used to:

- implement internal Flemish climate policy with a view to reaching the Flemish greenhouse gas emission reduction targets;
- implement Flemish policy on the flexibility mechanisms set out in European and international legislation and conventions;
- cover the Flemish contribution(s) as part of the international support

for developing countries in their fight against climate change in accordance with the decisions of the UNFCCC;

- remediate loss of competitiveness among Flemish businesses as a result of European and international climate policy (indirect carbon leakage); and
- cover all policy costs relating to preparations, organisation or contributions in the framework of climate auctions.

Globe - Maarten Vanden Eynde, Le Vent des Forets 2013

In drawing up the Flemish Mitigation Plan, a provisional rough estimate was made of the income from the Flemish Climate Fund, as well as the financial requirements in relation to the aforementioned items of expenditure.

It showed in no uncertain terms that the resources available are limited by comparison to the needs. In the first place, therefore, it is necessary to set priorities and to make choices. In addition, the Flemish Government needs to work hard towards co-financing via other Flemish budgetary items and other authorities, and also via families and industry. The Climate Fund can provide the necessary leverage in this respect. It will be a case of creating climate revenue from other (existing) Flemish financial or taxation instruments and working towards a smart instrument mix (a combination of economic instruments with regulation and social instruments such as awareness raising and voluntary agreements).

The timing and extent of Flemish income from auction revenues in relation to permanent industrial establishments under the EU ETS in the 2013-2020 trading period depends on the outcome of the intra-Belgian effort sharing process (§2). Given that this outcome is uncertain, the Flemish Government for the time being only considers the resources already available in the Flemish Climate Fund on approval of the Flemish Mitigation Plan, which were one-off revenues from the sale of the remainder of the new entrants reserve[3] from the 2008-2012 trading period. Of this, after the purchase of emission allowances to close the reduction gap in the period 2008-2012 and to set up a buffer for the period 2013-2020, another EUR 20 million remains. This sum will be used in full to finance an initial set of priority and cost-effective internal measures in the short term (2013-2014).

In 2012 all Flemish ministers and policy areas were called upon to give additional policy proposals to close the remaining reduction gap for the period 2013-2020. The policy areas in question proposed 33 extra internal mitigation measures with potential for co-financing through the Flemish Climate Fund in the coming two years. These extra policy proposals for the period 2013-2014 were tested against an assessment framework that guarantees prioritisation of internal measures and the cost-efficient allocation of the funds put towards internal Flemish climate policy in the

[3] The new entrants reserve is the part of the emission allowance for EU ETS businesses set aside for new entrants or expansions.

period 2013-2014. Specifically, they were tested against four main criteria: additionality (added value compared to existing policy), sustainability (side effects on environment, economy and income distribution), implementation trajectory (how quickly it leads to reductions) and cost efficiency (ratio of cost of measure/impact on emission reduction, or euros per ton of CO_2-reduction). On the basis of this assessment, the following proposals were selected as measures to be financed as a matter of priority:

- substantial renovation grant for Social Housing Companies;
- increased grant for combined and "parallel" investment in wall insulation and glazing;
- telemetry for use of electricity, gas and water in school buildings to counter standby usage and identify changes in consumption patterns more quickly;
- adjustment of grants for the rational use of energy (RUE) for SMEs;
- intensive sectoral energy guidance and advice for SMEs;
- specialised energy consultants for heritage property;
- expansion of logistic consultant activities;
- specialised energy advice for operators of tourist companies and accommodation;
- extension of the energy consultant project for farmers;
- investment support for a pilot project on the use of low value residual heat in a greenhouse cluster;
- investment support for small scale fermentation (small scaled fermenters) in agricultural companies;
- trial project involving biogas to power minibuses for De Lijn (public transport company);
- development of shorepower infrastructure for inland navigation; and
- increase in the offer of electrical charging posts on carpooling parks run by the Flemish Region.

These measures were included under the sectoral chapters of the Flemish Mitigation Plan and the resulting emission reductions were computed in the BEL scenario (§5).

In the longer term, 2015-2020, resources will again become available for internal climate policy, but their extent is not yet known. A new financial framework will be worked out for this period.

THE MAP IS NOT THE TERRITORY, Griet Dobbels, Arpia 2012
600 hikers drew a living altitude line in the countryside of Herzele
Photos by Griet Dobbels and Annelien Vermeir

Open air museum, Jean-Daniel Berclaz ,Musée du Pont de Vue, Beeldenstroom 2012 Photo Yves Adams

PART 3: The Flemish Adaptation Plan

1 Purpose of the plan

Climate change will produce effects all around the world, and so also in Flanders. To meet the challenges these effects entail, Flanders will have to adapt. Waiting until the effects of climate change are actually noticeable before responding will lead to greater risks and higher costs than timely preparations will. Therefore, this Flemish Adaptation Plan (VAP) focuses on how the Government of Flanders intends to respond and when the Government of Flanders will take action.

The primary goals are:

1. Understand the Flemish vulnerability to climate change.
2. Improve Flanders' ability to defend against the effects of climate change.

The concurrent pursuit of these goals can be described as the "climate reflex". This reflex involves screening existing and newly developed policy against the climate scenarios (goal 1), and where necessary adapting them (goal 2).

The secondary goals are:

- Designing coherent and integral policies.
- Listing existing adaptation initiatives and connecting with other adaptation initiatives and other policy subjects, such as mitigation.
- Initiating (or calling for) new adaptation measures.
- Increasing the visibility of the parties involved.
- Setting up a system by which to monitor the effectiveness of the VAP.

The extra effects are:

- Awareness is created, with the result that adaptation becomes a clearly visible goal for all stakeholders, both in and outside the Government of Flanders.
- This awareness creates a stimulus for all stakeholders to adapt to climate change.
- The VAP structures effects and measures, making it simpler to clearly identify gaps, risks, opportunities and synergies and communicate about them.

2 Starting points

Adaptation to climate change must be cost effective in the broadest sense of the term. This means that the costs of adaptation must be lower than the costs of the damage prevented, taking into account a number of possible uncertainties. It will often be difficult to determine these costs with adequate certainty. The timely implementation of adaptation measures will cost much less than suffering the effects without preparation or taking late and more draconian action. The measures must therefore be taken at the appropriate time. In some cases this will mean that a measure has to put in place as soon as possible, whereas in others it will be better to wait for an appropriate economic situation, such as the replacement of a machine or the redesign of a city district, or for the climatological situation to develop further.

For Flanders, climate change equates to a rise in temperature, drier summers (with a few heavy storms), more humid winters and a rise in sea level. These effects are dependent on worldwide greenhouse gas emissions. Since so many variables are involved, the impact of climate change remains complex and to a certain extent unpredictable. It is not yet certain, for example, to exactly what extremes the weather will change. Nor is it certain how society will respond to climate change. A monitoring system and closer

study will therefore be needed. This will necessitate the grouping together of and communication between all available knowledge and information. But this need for information must not be used as a means of further postponing actual adaptation.

One important starting point in Flemish adaptation policy is that of improving resilience. By adapting the various systems (physical, economic, social) and strengthening them, these systems are made more resilient and better able to absorb the effects of climate change. Additionally, a more resilient system is healthier when it comes to aspects other than just adaptation.

For certain adaptation challenges it is necessary to make use of ecosystem services. Ecosystem services comprise all the goods and services that ecosystems provide to society, such as natural protection against floods, pollination by wild insects, natural water purification, climate regulation, nature-related recreation, and so on. What is needed is healthy and resilient ecosystems that offer functional and balanced biodiversity. Besides adaptation, these ecosystem services are also necessary for the sustainable development of the Flemish economy and society. Given that climate change almost always leads to added stresses on a system that is already under pressure, adaptation measures are usually variations (continuations, adjustments and/or intensifications) of existing measures.

Adaptation measures must be robust, and even no-regret, meaning that the measures remain valuable, (mostly) irrespective of the degree of climate change. This will usually favour low-tech, low maintenance, energy efficient, natural, simple systems.

There is a high degree of interdependence between the different policy areas. Good cooperation between and within these policy areas can lead to win-win situations. Besides a positive adaptation effect a measure can have other benefits, such as in the areas of mitigation, ecology, and economy. Viceversa, a measure that was not put in place with adaptation in mind, can still have added value for adaptation. It is, therefore, of great importance

that adaptation policy should be developed and implemented across the different policy areas. If it is not, Flanders runs the risk of maladaptation. This will shift the negative effects of climate change to another party.

Climate adaptation falls within the sustainability principle, where we see to our own needs without jeopardising the ability of future generations to see to theirs.

Many of the sectors and their measures have a spatial planning aspect. These different claims on space must be accommodating of each other and of other demands for space.

Motivated by climate adaptation, measures and policy instruments are being developed that serve as drivers of technological innovation and that are of interest when it comes to exporting knowledge to other countries.

Salicetum, Will Beckers, Beeldenstroom 2012 Schellebelle, Photo Yves Adams

3 Process and responsibility

Many aspects of Flemish policy do, to a greater or lesser extent, relate to the weather and consequently to climate. Therefore, changes in climate influence many different policy fields and policy areas. This is why the present adaptation plan has been drawn up by the policy areas collectively[4], with the Department of Environment, Nature and Energy serving as writer and moderator. This was achieved through the Flemish Task Force on Adaptation (VTFA). Each of the members of the Task Force is coordinating between their own sector (department) and the rest of the representatives. In addition, the VTFA served as a platform for knowledge exchange (involving national and international good examples) and to harmonize between the policy fields. Since the approval of the Flemish Adaptation Plan, the VTFA has coordinated the plan's implementation.

The method used by the VTFA still expects all policy areas involved to respond to climate change through their own policy. Adaptation will therefore have to be structurally integrated into the policy and activities of the policy areas. This is why the necessary studies, new initiatives or the intensification of existing actions must be controlled in terms of content and finance in line with policy by the organisations responsible. Therefore, there will be no separate development of an adaptation item in the Flemish budget. Even if it were decided to reimburse certain parties for services needed, the remuneration would go through the usual budget items. Nevertheless many policy fields are strongly interwoven. Consequently it is extremely important that adaptation policy be developed and implemented across the various fields of policy.

[4] The coordinating adaptation taskforce is made up of staff from the policy area Public Governance, the policy area Economy, Science and Innovation, the policy area Finance and Budget, the policy area Flemish Foreign Affairs, the policy area Agriculture and Fisheries, the policy area Environment, Nature and Energy, the policy area Mobility and Public Works, the policy area Education and Training, the policy area Spatial Planning, Housing Policy and Immovable Heritage, the policy area Welfare, Public Health and Family and the secretariat of the Integrated Water Management Coordination Committee.

Adaptation in Flanders will be larger than merely the confines of the Government of Flanders. At the local level as well, in the business world, and among individual citizens, initiatives will have to be taken. Nonetheless, this plan is confined to the possibilities within the Government of Flanders. This takes nothing from the fact that other target groups might be influenced by this regional government and that the various levels of governments will have to cooperate with each other.

4 Climate change in Flanders

The degree of climate change in the future cannot be established with certainty. This is because we do not know how global greenhouse gas emissions will develop or precisely what the consequences are likely to be. In addition, climate change modelling is constantly improving. Despite these uncertainties there is consensus over several scenarios considered robust enough to serve as a basis for policymaking. In the case of Flanders, these scenarios can be summarised as follows:

- All climate scenarios for Flanders indicate without ambiguity a rise in the environmental temperature (+1.5 °C to +4.4 °C in the winter; +2.4 °C to +7.2 °C in the summer), higher evaporation levels during winter and summer, and more precipitation during winter by 2100.
- Most climate scenarios show a drop in average summer precipitation for Flanders. This, combined with higher evaporation levels, increases the chance of serious water shortages.
- Despite the decrease in summer precipitation, an increase in the number of extreme summer thunderstorms can be expected in Flanders.
- The sea level at the Flemish coast could rise a further 60 to 90 cm this century, 200 cm in the worst-case scenario.

5 Inventory and sector specifics

To bring order in the multitude of subjects, the plan is divided into a number of sectors. Below a brief summary of these sectoral chapters is given, as well as the list of measures per sector (in attachment). The entire plan is available via klimaatplan@lne.vlaanderen.be.

5.1 Water management

Three major effects are anticipated in water management. Climate change leads to a greater chance of flooding, both from the sea and from the rivers, as well as indirectly from sewerage systems. In addition, water quality may deteriorate, mainly due to the change in water temperature (and its effect on aquatic flora), salinization and higher percentages of pollutants resulting from increased sedimentation and evaporation. Furthermore, extended periods of drought (coupled with higher temperatures) can have a negative effect on the availability of (potable) water, with knock-on effects for public health, nature, agriculture, shipping, etc.

The specific measures used to counter this are grouped around sustainable water management, a balance between the use and replenishment of groundwater, better management of surface water, flood protection and limiting the risk of flooding and improving the hydromorphology of water flows. Flemish water management is set out in River Basin Management Plans. The first generation of River Basin Management Plans was set up by the Government of Flanders in October 2010 and covers the period 2010 - 2015, whereas the new, second generation plans (period 2016-2021) are now being drafted. Though many of the adaptation measures are already described in the current River Basin Management Plans, adaptation plays a much more explicit role in the second generation plans. In addition, as regards protection of the coast against storm surges and flooding, the principle of "soft (natural) measures where possible, hard (concrete) measures where necessary" will continue to apply.

5.2 Environment

The environment sector is traditionally divided into three compartments: air, water and soil. The effect that climate change will have on the compartment water has already been covered in the water management sector. Its effect on air quality will consist in an increase (or slower decrease) of ozone and fine particulate concentrations. But the biggest adaptation challenge in environment will be that of maintaining soil quality, both physically (the problem of erosion, for example) and in terms of composition. The main solutions here are mostly area-specific and include research and awareness-raising.

5.3 Nature

The effect of climate change on water management, the more frequent occurrence of forest fires and floods, and changes in biological processes and migration patterns makes the nature sector a fine example of a system that is already under pressure and about to take an even heavier strain. The element "nature" should be understood in the broad sense here, and also covers green areas in cities, grass verges, etc., where the nature is part of a multifunctional space. A more robust nature is more resistant to the pressures of a changing climate (for example, by facilitating the migration of species), as well as to stresses such as pollution. Ecosystems can be made to be more robust by, in addition to intensifying current policy, intertwining nature with other functions and thereby promoting green-blue veins and defragmenting nature areas. This should also help to maintain a good level of preservation.

On the other hand, nature can counter the effects of climate change, such as the cooling effect of green and blue areas in the city or the sponge effect of green areas in preventing floods.

5.4 Industry and services

Climate change will have both positive and negative effects on Flemish industry. The negative effects mostly relate to the nuisance of water shortages and flooding to commercial activity. At the same time, climate change could alter our international competiveness or create niches that appear lucrative. Specifically, consultation will need to commence with the insurance sector and a climate strategy will need to be developed in the Flemish transition process "New Industrial Policy". Among other things this will involve keeping an inventory of possible change to the trade balance and investigating how damage to the competitive position and innovative character of Flemish industry in the international perspective might be prevented. One of the components here is a flexible labour market, able to adapt to the effects of climate change. Besides this overall inventory, the possibility of raising awareness among business and industry will also be studied.

5.5 Energy

The demand for energy will shift. In hotter summers, mostly during heat waves, the demand for refrigeration will rise, whereas during the milder winters the demand for heating will fall. This implies a review of the calculation method that underpins the energy performance legislation. In addition, power generation could be affected by climate change (for example, shortage of cooling water).

5.6 Mobility

The quality of the Flemish infrastructure will be affected negatively on some points by the changing climate. Chiefly this will involve road drainage (during peak flows in the summer, for example) and the capacity of the waterways in times of extreme drought. Therefore, the design and maintenance of roads and civil engineering projects will have to be reassessed. Aviation and rail transport also anticipate (lesser) effects.

5.7 Tourism

It is expected that climate change will tend to have a mostly positive effect on the tourism sector, given that the tourist season in Flanders will be longer. Moreover, it is believed that in Southern Europe the summer period may become uncomfortably hot. It is best, therefore, to discuss any improvement of the sea defences in consultation with this sector, so as not to harm (but possibly to enhance) the attraction of the Flemish coast for tourists.

5.8 Agriculture

The agricultural sector, given its close connection and interaction with the natural environment, will possibly be the most directly affected by climate change. Changes in the weather patterns (temperature, precipitation), the availability of water and the CO_2 content in the air could have significant effects on plant and animal production. Plant production may be positively affected by the higher CO_2 concentration and longer growing season, but this may be negatively offset by phenomena such as dehydration, saturation, damage caused by heavy rains and hailstorms, disease and infestations. In polder areas, salinization can constitute a growing threat to plant production. It is probable that compared to the effects on plant production, the effect on animal production will be lesser, but there are losses to be expected here too, especially as the result of heat stress. Specifically, research will be done into other farming methods and adaptations in choice of species, and awareness of the subject will be raised in the sector. In addition, the importance of sustainable water management and the possibility of blue services via the agricultural and horticultural sectors will be communicated.

5.9 Fisheries

The change in the temperature of the sea will cause migrations of fish (species). Therefore, attempts will be made to facilitate more flexible and sustainable fisheries within the bounds of the (European) legislation.

5.10 Built environment

The anticipated heat waves will cause, due to the physiological properties of the built environment, a disproportionately high discomfort in city centres. A variety of measures can be used to reduce the impact. Thus greenery in the city and certain building designs may provide relief, giving rise to a clear synergy with mitigation. In this sector as well, attention will turn to appropriate education, so that people are able to learn from each other across the traditional sectors. In existing structures, it will be necessary to look at the possibility and necessity of alteration. In the built environment the need to commence with timely adaptation is particularly great, given that structures stand for decades. The buildings being designed and built now will probably still be used in a future whose climate differs from todays.

5.11 Health

Due to heat waves, floods and, indirectly, due to (among others) insect infestations climate change will have a negative effect on health. In response to this the Flemish Government will direct specific awareness raising campaigns at citizens.

Aeneas Wilder, Untitled #158, 2012
Pit -Art in public space, Borgloon Photo Kristof Vrancken/Z33

6 Continued effect

6.1 Climate reflex

A theme shared by the various sectors is the climate reflex, whereby policy is screened against the climate scenarios and, if necessary, adjusted.

When this plan is complete the climate reflex will remain a necessity. Everywhere, also including within the Government of Flanders, the consideration of climate change must become self-evident in new and existing plans and strategies. Adaptation recurs in just about every area of policy. Therefore the climate reflex should be present in all Flemish policy and management plans to check if the plan carries consequences for the distant future, described here as 50 years or more, and if so, whether the considerations that lie at the basis of the strategies and measures will remain viable in a changing climate. Given that the adaptation policy is based on scenarios that can change according to our progressive understanding of the future, it is important that the policy be developed with sufficient flexibility that it can be adjusted, if needs be, in the future.

To achieve this, the Flemish policy areas in question (assembled in the Flemish Adaptation Task Force) must continually seek initiatives in which the climate reflex should be applied. Care must be taken here to ensure that no unnecessary administrative pressure is created. The climate reflex will, in as far as possible, be integrated as part of the existing policy support instruments. What we have in mind here, besides the Environmental Impact Statement, are for example social cost-benefit analyses and the Sustainable Development Quick Scan in the regulation impact analyses.

6.2 Raising awareness

Climate change is a long-term occurrence, with still many unknowns and this makes it difficult to motivate stakeholders to take action now. True, the effects of climate change can already be felt, but they still fall within

the natural extremes of the weather. This is why we sometimes don't yet feel the need to roll up our sleeves and get started. To counter this, climate change will be made as specific as possible in our communication. This is because equating climate change with specific societal and financial consequences makes people better able to estimate the importance of adaptation. It will also be stressed that climate adaptation is, for the most part, simply a matter of common sense. By stressing that the challenges presented by climate change and the solutions to them are variations of problems and measures that are already being applied, we will make climate change less of an "it won't happen here" story. As with every form of communication, it is important that the manner of communication be appropriate to the target group. One particular group is that of educational institutions, which have to be given adequate scientific information.

6.3 Spatial planning

Both the effects of climate change and the measures to counter them have an important spatial dimension. Consequently, there is significant interaction between adaptation policy and spatial policy. Not only will many measures have a continued spatial effect, but spatial planning itself can mitigate the effects of climate change. Adaptation to climate change must become an integral part of sustainable spatial development, with a need for a supra-local strategy and an appropriate range of tools. It must also be possible to assess spatial measures according to their impact on climate, something that can also be seen as an implementation of the climate reflex. More concretely, we can say that climate change will benefit from compact settlements and infrastructures and the protection of open space.

The effects of climate change will be highly differentiated in spatial terms. We can expect that in many areas the adaptation measures will result in different claims on water and space, which will need to be weighed against each other. An area-oriented approach, geared towards a coherent and area-specific collection of measures, would appear self-evident because it takes into account specific regional accents. With this method there is no

Satzmachine, Nico Parlevliet, Beeldenstroom 2012 Schellebelle, Photo Yves Adams

need to start from scratch in each area. Comparable environmental types such as coast, city, small centres, polders and valleys face comparable challenges, and so a (literature) study of other initiatives in similar types of environment could prove illuminating.

The spatial considerations listed in this adaptation plan, such as for example space for water (storage) or the more robust nature areas, will be implemented in the Flanders Spatial Policy Plan, which is currently under development.

The outcomes of the IWT-SBO "CcASPAR" study, which has studied the continued spatial effect of climate change in Flanders extensively over the last four years, will also be used. This research gives recommendations or asks key questions, largely related to continued spatial effect. CcASPAR provided a valuable sounding board group for the research. The CcASPAR network will carry on as a "think tank for a climate-resistant Flanders", which will meet with a frequency still to be decided and study the less technical and

more overreaching adaptation challenges linked to spatial planning across the various policy fields.

7 Follow up

To ensure that adaptation policy development and implementation do not come to a standstill after this plan has been issued, periodic sectoral adaptation meetings will be organised for each sector, to be chaired by a so-called pilot. The meeting will cover the progress and main developments concerning adaptation in the sector. The consultation, in addition to reporting the state of affairs, will play an important role in the transfer of knowledge. The outcomes of these consultations, which will cover among other things the progress made through the various measures, will be gathered together and put before the VTFA. Sectoral adaptation consultations will commence with a broad opening meeting for all stakeholders (in and outside the Government of Flanders) at which the plan's most important elements for each sector will be presented, along with the expected measures. The pilots will decide whether the next rounds of adaptation consultations should also be this broadly organised.

In addition, a system will be developed which will be able to indicate the extent to which climate adaptation is embedded in the various policy areas of the Government of Flanders. Once this screening tool has been developed, a periodic examination of the Government of Flanders will be carried out, interacting with relevant Flemish and international monitoring.

OLNETOP, Nick Ervinck, Beaufort 04, Bredene
Photo Jimmy Kets

Attachment: list of measures in the Flemish Mitigation Plan

Below we give a list of measures put in place by the Government of Flanders for every non-ETS sector. The following terms are used to show the status of the measures:

Status		Description
I	Implemented	Measure already implemented and set to continue in the period 2013-2020
A	Accepted	Measure on which an official decision has been made and for which implementation can begin
P	Planned	Measure on which a decision in principle has been made by the Government of Flanders or for which administrative regulations in relation to its future implementation are under study
T	Tabled	Measure on which no decision in principle has yet been made by the Government of Flanders

Mobility sector

No.	Title	Status
1.1	**Control of the number of vehicle km by road**	
1.1.1	Towards an effective pricing of vehicle km by road	
A	Differentiated kilometre tax for goods vehicles	P
B	Trial project on differentiated kilometre tax for passenger cars	P
C	Development of pricing mechanism for passenger cars (dependent on evaluation B)	T
1.1.2	Additional measures to control the number of vehicle km by road	
A	Stimulation of carpooling	I
B	Stimulation of car and cycle sharing	I
C	Stimulation of teleworking through existing and new instruments	A

No.	Title	Status
D	Specific investment in safe and comfortable cycle infrastructure	I
E	Continued development of public transport	I
F	Improvement of commuting fund operation	P
G	Take maximum advantage of the potential for electric bicycles and scooters	T
H	Organisation of trial projects for the mobility budget and development of a software tool	I
I	Application of STOP principle in city centres	I
1.1.3	Additional measures to control the growth in the number of goods vehicle km by road	
A	Optimisation of the logistic chain	P
B	Improvement of manufacture to consumer distribution (including last mile distribution)	P/I
C	Stimulation of initiatives for green logistics/return logistics	P/I
D	Retention and attraction of logistic activities with high added value	T
E	Support businesses (via logistics consultants)	A
F	Develop support tools (such as roadmap for green logistics, simulation model to optimise the time of goods flows, best practices in relation to green logistics, etc.)	A
1.2	**Improvement of environmental characteristics of the vehicle fleet and its fuels**	
1.2.1	Strengthening of European policy: make the case for ambitious vehicle standards at European level	P
1.2.2	Deployment of sufficiently effective tax instruments for modifying behaviour	
A	Reform of vehicle registration tax (BIV)	I
B	Reform of road tax	A
1.2.3	Communication	A
1.2.4	Stimulation of use of alternative vehicle technologies	
A	Stimulation of use of electric vehicles by: implementing the electric drive master plan	T
B	Stimulation of use of electric vehicles by: eliminating financial thresholds via tax incentives	T
C	Stimulation of use of electric vehicles by working towards innovation	A

No.	Title	Status
D	Stimulation of use of electric vehicles by: developing user benefits (facilitating installation of charging posts, filling station concessions, parking fees, etc.)	T
E	Stimulation of use of electric vehicles by: developing the energy supply for electric cars	A
F	Implement large-scale projects when trial projects reach an end	T
G	Stimulation of use of natural gas: check whether the ecology grant offers an adequate incentive and check what (other) incentives the sector needs	A
H	Stimulation of use of natural gas: organisation of a demonstration project on LNG	P
I	Stimulation of use of natural gas: simplify and make more attractive the installation of natural gas stations	I
1.2.5	Example set by Flemish Government	
A	Increase ecoscore of own fleet and reduce fuel consumption	A
B	Introduction of electric vehicles to Flemish Government fleet	P
C	Development of charging facilities in or near large administrative buildings and Flemish administrative centres (FACs) for service and private vehicles	I/T
1.2.6	Green public transport	
A	Purchase of buses that meet the EEV (Environmental Enhanced Vehicle) standard	I
B	Newly purchased vehicles are B30-resistant	I
C	Purchase of hybrid buses	I/P
D	De Lijn participation in electric drive test garden	I
E	Study of the potential for hydrogen use (fuel cells) in the long term, including through experimentation	I
F	Trial project in a dial-a-ride area, driving on biogas	T
G	Implementation of tram projects in all Flemish provinces	I/P
H	Taking account of environmental friendliness of operator's bus fleet when awarding operation contracts	T
1.2.7	Green taxis	A
1.2.8	Greening of the logistics sector	
A	Encourage use of economical vehicles through awareness raising and other instruments	P

No.	Title	Status
B	Study of reduction potential of long and heavy goods vehicles (LHVs) and improved aerodynamics	A
C	Organisation of LHV trial project	A/P
1.2.9	Stimulation of use of alternative fuels via the drawing up and implementation of a Flemish Biofuel plan	P
1.3	**Stimulation of economical driving**	
1.3.1	Reform of driving test and training	
A	Inclusion of ecodriving in the driving lessons and driving test by making arrangements with the federal government and other regions on the conditions for gaining a driving license	T
B	Inclusion of ecodriving in the driving lessons and driving test by improving the training for driving instructors and examiners	T
C	Extending Flemish government training courses to include economical driving	A
D	Ecodriving training for all De Lijn drivers and instructors	I
E	Equipping De Lijn buses with driving style meters	I
F	Focus on the principles of economical driving in driving education projects financed by the Flemish Government	T
G	Checking with the sector to see how ecodriving training can be stimulated and how the principles can be put into practice	T
H	Awareness raising campaigns about the vehicle parameters that affect emissions (load, tires, etc.) and ecodriving	I
1.3.2	Improving speed limit enforcement	
A	Continuation of speed checks using mobile units and unmanned cameras	I
B	Extension of fixed average speed checks on motorway network	I
C	Development of ANPR (automatic number plate recognition) network with fixed average speed checks on underlying road network	A
D	Investigation of the possibilities to boost the use of ISA systems (intelligent speed adjustment)	T
1.3.3	Improved circulation	
A	Use of dynamic speed limit signs on main roads to improve circulation	I
B	Inclusion of guidelines and recommendations on environment friendly road layout in AWV service contracts and local authority handbooks	P

No.	Title	Status
C	Optimisation of traffic light regulation on primary and secondary roads and at intersections in urban areas	I
1.4	**Efficiency improvements in shipping**	
1.4.1	Development of a grant system for emission reducing technologies	A
1.4.2	A regulatory and logistic framework for liquefied natural gas (LNG)	A
1.4.3	Optimal use of shorepower	
A	Development of solutions for bottlenecks in supply of shore power	A
B	Development of a coordinated vision on design, management and maintenance of shorepower infrastructure	A
C	Harmonisation of shorepower payment system	A
D	Creation of a composite map of existing shorepower installations and the zones where shore power should be provided	I
E	Setup and maintenance of website giving information on shorepower in Flanders	I
F	Study of support measure for inland navigation vessels	A
G	Gathering of data on the use of shorepower in Flanders	I
H	Coordination of actions with federal government	A
I	Investment in development of additional shorepower infrastructure by waterway operators	I
1.4.4	Stimulation of the Environmental Ship Index (ESI) and differentiated harbour dues	A
1.4.5	The 3E Inland Navigation Action Plan for sustainable inland navigation	
A	Implementation of actions in 3E Inland Navigation covenant and 3E Inland Navigation Action Plan	I
B	Increase of the share of inland waterways in freight transport through implementation of the Infrastructure Master Plan for the Flemish waterways	I
1.5	**Control the long term growth in road traffic (outlook to 2050)**	
1.5.1	Allocation of responsibilities	
A	Inclusion of environmental impact and CO_2 emissions when assessing infrastructure projects	T

No.	Title	Status
B	Allocation of responsibilities of policy areas as regards contribution to traffic generation and associated CO_2 emissions (purpose: climate target given more explicit consideration and factored in when strategic choices are made that involve extra traffic flows)	T
1.5.2	Well-conceived spatial policies	
A	Development of well-conceived spatial policies in the Flanders Spatial Policy Plan	A
B	Development of new instruments to stimulate residence in city centres and in the vicinity of public transport	T
1.5.3	Support breakthrough of new technologies	T

Buildings sector

No.	Title	Status
2.1	**Regulations**	
2.1.1	Energy performance and indoor climate requirements (EPB requirements)	I/T
2.1.2	Energy performance certificate (EPC) and energy advice procedure	I
2.1.3	Improve maintenance of central heating boilers and incentivise the replacement of old boilers, combined with increase of existing grant for boiler replacement for protected buyers	T
2.1.4	Energy performance requirements in the Flemish Housing Code	I
2.1.5	Valorisation of the energy performance certificate in social housing construction	A
2.1.6	Energy correction in social housing rent	P
2.1.7	Imposition of specific EPB requirements for positive recommendation by VMSW of new social housing construction and for full renovation	I
2.1.8	Imposition of specific EPB requirements as a condition for project funding in the policy areas of welfare, public health and family	I
2.2	**Information and compulsory information measures**	
2.2.1	Information provision and awareness raising about the rational use of energy and environment friendly power generation	I
2.2.2	Energy consultant projects	I

No.	Title	Status
2.2.3	Action Plan for micro-CHP	I
2.2.4	Demonstration projects in social housing construction	I
2.2.5	Demonstration projects in school construction	I
2.3	**Financial instruments**	
2.3.1	Lowering of withholding tax on property for energy efficient newbuilds	I
2.3.2	Support for full renovation of existing homes	T
2.3.3	Encouragement to demolish homes with poor energy performance	T
2.3.4	Allocation of a renovation grant for energy related investments	I
2.3.5	2020 energy renovation programme in social housing	I
2.3.6	Grants for meeting the EPB requirements in new and fully renovated school buildings	I
2.3.7	Grants for rational use of energy in existing school buildings	I
2.4	**Energy services for energy savings**	
2.4.1	Flemish Energy Enterprise	A
2.4.2	Accelerated investment in (new) school infrastructure via alternative financing	I
2.5	**Energy saving mechanisms**	
2.5.1	RUE public service obligations imposed on electricity distribution network operators	I
	Relevant measures from the industry sector:	
4.1.3	Stimulation of generation of green heat and use of residual heat	I

Agriculture sector

No.	Title	Status
3.1	**General agriculture measures**	
3.1.1	Intensification of awareness raising	I
3.1.2	Common European Agricultural Policy and the Flemish Rural Development Programme Document	P

No.	Title	Status
3.1.3	Study of measuring instruments for greenhouse gases, reduction techniques for greenhouse gas emissions, rational use of energy and renewable energy in the Flemish agricultural and horticultural sectors	I
3.2	**Energy-related emissions**	
3.2.1	Energy savings through rational use of energy (RUE)	I/T
3.2.2	Generation and use of sustainable and renewable energies	I/T
3.2.3	Optimal use of fossil fuels	I
3.3	**Non-energy related emissions**	
3.3.1	Reduction of CH_4 emissions through enteric fermentation (cattle)	I/T
3.3.2	Reduction of N_2O and CH_4 emissions through manure management (cattle, poultry and pigs)	I/T
3.3.3	Reduction of N_2O emissions from soil	I
3.4	**Consumer behaviour and improved sustainability of the entire chain**	
3.4.1	Short Supply Chain Strategic Plan	I
3.4.2	Biological Agriculture Strategic Plan	I
3.4.3	Prevention of food loss and maximum valorisation of alternative streams	I
	Relevant measures from the buildings sector:	
2.2.2	Energy consultants projects	I
2.5.1	RUE public service obligations imposed on electricity distribution network operators	I
	Relevant measures from the non-ETS industry sector:	
4.1.3	Stimulation of generation of green heat and use of residual heat	I

(Non-ETS) industry sector

No.	Title	Status
4.1	**Energy-related emissions**	
4.1.1	Energy Planning Decision	I
4.1.2	Energy Policy Agreement	P
4.1.3	Stimulation of generation of green heat and use of residual heat	I
4.1.4	Guarantee of stable investment climate for CHP	I

4.1.5	Encouragement of CHP and heat networks	P
4.1.6	Ecology premium	I
4.1.7	Green Guarantee	I
4.1.8	SME energy efficiency plan	T
4.1.9	Sustainable industrial estates	I
4.2	**Industrial process emissions**	
4.2.1	N_2O emissions via caprolactam industry	T
4.3	**F-gases**	
4.3.1	Leak protection requirements	I
4.3.2	Certification obligations	I
4.3.3	Inspection campaign for F-gases	I
4.3.4	Limitation of F-gas losses from refrigeration installations due to leakage	T
4.3.5	Stimulation of the use of climate friendly refrigerants	T
	Relevant measures from the buildings sector:	
2.1.1	Energy performance and indoor climate requirements (EPB requirements)	I/T
2.2.1	Information provision and awareness raising on the rational use of energy and environment friendly power generation	I
2.2.2	Energy consultants projects	I
2.5.1	RUE public service obligations imposed on electricity distribution network operators	I

Waste sector

No.	Title	Status
6.1	**Waste incineration**	
6.1.1	Improvement of energy recovery in waste processing plants	I
6.2	**Composting**	
6.2.1	Pre-treatment of household organic waste	P

Bamboost groot, Georges Cuvillier, Beeldenstroom, Schellebelle 2012
Photo Yves Adams

Attachment: List of measures in the Flemish Adaptation Plan

The list below is a distillation of all measures announced in the Flemish Adaptation Plan (or already implemented). It should not be seen as exhaustive as still more measures will be necessary or desirable in the years to come. Furthermore, not all measures were designed with adaptation in mind.

Water management

No.	Title
1.1	Optimization of sustainable water consumption in all sectors
1.2	Optimization of use of alternative water sources
1.3	Expansion and optimization of the distribution network (tapwater, grey water, rainwater)
1.4	Development of a uniform and incentivising grant policy and price structure
1.5	Remediation and protection of groundwater reserves in drinking water protection zones
1.6	Remediation and protection of groundwater reserves in other protected areas directly dependent on groundwater
1.7	Remediation and protection of surface water management in drinking water protection zones
1.8	Remediation and protection of surface water management in other protected areas
1.9	Protection and remediation of groundwater reserves (balanced management of reserve), account taken of the impact of water scarcity and drought (e.g. salinization)
1.10	Development and application of a groundwater level and region-specific licensing policy
1.11	Active water level management
1.12	Reduction of the effects of water scarcity and drought (e.g. development of low water strategies)
1.13	Protection or safeguarding of water conservation areas to counter regression of hydraulic regime for body of surface water

1.14	Legislation and licensing of surface water extraction
1.15	Banning new flood sensitive developments (Prevention)
1.16	Removal of constructions in flood sensitive areas (Prevention)
1.17	Alteration of constructions in flood sensitive areas (Prevention)
1.18	Other preventive measures including insurance (Prevention)
1.19	Water retention (Protection)
1.20	Water storage (Protection)
1.21	Protection of coastal and transitional waters (Protection)
1.22	Protection from non-tidal waters (Protection)
1.23	Ensure safety-based drainage-capacity (Protection)
1.24	Maintenance measures and rehabilitation of canals (including those with towpaths) (Protection)
1.25	Conversion and development of forecasting and warning systems (Preparedness)
1.26	Increase of public awareness and preparedness (Preparedness)
1.27	Measures after a flood to return to the same or a better position than before the flood
1.28	Reduction of diffuse pollution of surface water by nutrients from the agricultural and horticultural sector
1.29	Integrated management of banks
1.30	Structural repair (based on hydromorphological development potential)
1.31	Integration / adjustment of recreational pressure in / on the system capacity
1.32	Countering sedimentation in watercourses
1.33	Studies and research projects
1.34	When protecting the coast against storm surges and floods the following principle applies: "soft (natural) measures where possible, hard (concrete) measures where necessary". This means looking first at the possibility of a soft sea defence through sand nourishment before turning to a "hard" construction. The Coastal Safety Master Plan operates according to this principle.

Environment

No.	Title
2.1	Study the need to make certain erosion prevention works more enforceable
2.2	Further develop policy on organic matter
2.3	Climate adaptation and the associated climate reflex to be included in MER handbooks
2.4	Awareness-raising of the need for healthy soil, in particular with reduced soil treatment, possibly grant-aided
2.5	Study of the effect of climate change on the nitrogen cycle and amounts of organic matter
2.6	Study of the effect of climate change on the various links in material circuits

Nature

No.	Title
3.1	Join together isolated nature areas, increase their size and make them more robust
3.2	Weave nature into other functions to achieve a basic ecological structure
3.3	Account for climate change when setting up nature and other green areas; including choice of species and origin
3.4	Adapt nature and forest management, paying special attention to maintenance and disasters
3.5	Adjust the management of verges
3.6	Inclusion of climate adaptation in the development of species protection programmes and plans
3.7	Study and monitoring of the effect of climate change on specific (Flemish) species

Industry and services

No.	Title
4.1	Consultation with the insurance sector relating to possible development of new insurance products
4.2	Development of a climate strategy in the New Industrial Policy

4.3	Investigate the benefit of specific adaptation case studies through a few corporate test-cases
4.4	Awareness raising of the tourism sector

Mobility

No.	Title
5.1	Adjust design, specifications and maintenance of roads, including a drainage manual
5.2	Analyse building and user instructions for civil engineering works and adjust where necessary
5.3	Consider and adopt ARISCC (in part)

Agriculture

No.	Title
6.1	Study and awareness-raising on subject of switching to other cultivars or species, or alteration of sowing and harvest dates
6.2	Study and awareness-raising on subject of breed choice and feed composition
6.3	Study and awareness-raising on subject of preventing plant disease and infestations and animal disease
6.4	Create support, facilitate and incentivize the application of blue services in the integral water policy for the area
6.5	Awareness-raising of importance of shade (including small rural elements) for cattle

Fisheries

No.	Title
7.1	Amend regulations to facilitate flexible, sustainable fisheries
7.2	Study the effect of climate change on fish populations

Built environment

No.	Title
8.1	Study and possible adjustment of 'Energy Performance Calculation' method
8.2	Make adaptation a parameter in the development of sustainable new stable development concepts
8.3	Construct and maintain sustainable industrial estates
8.4	Adapt the buildings of the Flemish Government
8.5	Develop and improve instruments to assess sustainability of various building typologies
8.6	Steer and guarantee the adaptation aspect in urban renewal projects
8.7	Make adaptation part of (relevant) training courses
8.8	Study the effects of Flemish spatial structure on climate policy

Health

No.	Title
9.1	Specific awareness raising among target public about the dangers of heat waves

Organisation

No.	Title
10.1	Be alert to new initiatives and plans of the Government of Flanders requiring a climate reflex. Support the policy areas involved in applying the climate reflex
10.2	Each pilot will organize an opening meeting with the stakeholders. It is up to the policy areas to decide if they wish to make this an annually recurrent element
10.3	Organize and report on adaptation consultation
10.4	Periodic compilation of the various sectoral reports to create an adaptation progress report
10.5	Development of a screening tool to monitor the climate reflex in the Government of Flanders and effectively carry out this examination
10.6	Extend the CcASPAR network to become a new think tank for a climate-resistant Flanders

Colophon

Flemish Government
Environment, Nature and Energy Department
Koning Albert II-laan 20 bus 8
1000 Brussels (Belgium)
Tel. +32 2 553 11 20
klimaatplan@lne.vlaanderen.be

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Environment, Nature and Energy Department
Koning Albert II - laan 20 box 8 - 1000 Brussels
Tel. : +32 2 553 80 11 - Fax: 02 553 80 05 - info@lne.be - www.lne.be