Belgian National Adaptation Plan

NATIONAL CLIMATE COMMISSION

2017-2020

CONTENT

123rf/Paul Aniszewski

1. Introduction

Adaptation to climate change

Climate change is a major global challenge that requires a twofold solution: adaptation and mitigation are two complementary approaches for tackling climate change (see box).

Many impacts can be avoided, reduced or delayed by mitigation actions to reduce greenhouse gas emissions. Most early actions undertaken in the field of climate policy at international, European or national level focused on mitigation. EU leaders have committed to move towards a low-carbon economy and have endorsed targets for reducing greenhouse gas emissions progressively until 2050[1], consistently with the long-term objective to limit global warming to 2°C in comparison to pre-industrial levels.

Mitigation has the potential to reduce climate change impacts. However, even the most stringent mitigation efforts cannot avoid impacts caused by current and future climate change, which makes adaptation action essential to reduce the damage of these unavoidable impacts.

This plan proposes a set of national measures focused on adaptation to climate change. ■

[1] For 2050, the EU has endorsed the objective of reducing its greenhouse gas emissions by 80-95% compared to 1990 levels.

"Mitigation aims to avoid the unmanageable and adaptation aims to manage the unavoidable."

(Laukkonen *et al.*, 2009)

Adaptation versus mitigation

a. **Mitigation**: Human intervention to reduce or help to reduce the sources of greenhouse gases [2].

b. **Adaptation**: The process of adjustment to current or expected climate change and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to the expected climate and its effects [4].

Legal context

International level

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted at the "Rio Earth Summit" in 1992 in order to limit global warming and reduce its consequences.

Besides their commitment to mitigate climate change by reducing greenhouse gas emissions, the parties to the UNFCCC are also required to adopt measures to minimise the negative effects of climate change (adaptation). Furthermore, the countries listed in Annex II to the Convention must '*assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects*.'

Many important steps have been taken in the development of the adaptation regime under the UNFCCC. The key milestones are indicated below:

2001 : the Least Developing Countries work programme was set up to help these countries to deal with problems associated with adaptation to climate change (inter alia support for the preparation of National Adaptation Programmes of Action - NAPAs).

2006 : the Nairobi work programme on impacts, vulnerability and adaptation to climate change was adopted. Its objective is to assist Parties, to improve their understanding and assessment of impacts, vulnerability and adaptation to climate change and to help them make informed decisions on practical adaptation actions and measures to respond to climate change.

2010 : the Cancun Adaptation Framework (CAF) is established. Activities under the CAF relate to the following five clusters:

- implementation of adaptation activities and information channels, National Adaptation Plans (NAPs) and a work programme to consider approaches to address loss and damage;
- support to developing countries;
- institutions: establishment of an Adaptation Committee to promote the implementation of enhanced action on adaptation in a coherent manner under the Convention, and the creation of regional and national centres and networks;
- principles such as accordance with the Convention, country-driven approach, gender sensitivity, participation and transparency, guidance by science & local knowledge and adaptation mainstreaming;
- stakeholder engagement.

2015 : Article 7§9 of the Paris Agreement provides for Parties to engage, as appropriate, in adaptation planning processes and implement actions, including the development or enhancement of relevant plans, policies and/or contributions.

European level

In 2007, the European Commission organised a wide-ranging consultation throughout the EU through a green paper "Adapting to climate change in Europe – options for EU action". Following this consultation, in April 2009 the Commission published the white paper "Adapting to climate change: Towards a European framework for action" which "*encourages the further development of National and Regional Adaptation Strategies with a view to considering mandatory adaptation strategies from 2012*".

In April 2013, the European Commission adopted the EU strategy on adaptation to climate change, which sets out a framework and mechanisms for taking the EU's preparedness for current and future climate impacts to a new level.

The EU strategy focuses on three key objectives:

- promoting action by Member States;
- enhancing 'climate-proofing' action at EU level;
- better informed decision-making.

European Regulation 525/2013 (mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information relevant to climate change) provides that Member States shall report to the Commission no later than March 2015 (and every four years thereafter) with information on national adaptation planning and strategies, outlining implemented or planned actions to facilitate adaptation to climate change.

The European Commission will assess progress made by Member States in 2017.

National level

Belgium adopted its second National Climate Plan (2009-2012) in 2008, containing a section dedicated to adaptation. The third objective of the plan is to initiate a National Strategy for Adaptation. It also states the following: "*Belgium will assess the possibility of developing an adaptation plan on the basis of the acquired experience*".

In 2010, Belgium adopted its National Adaptation Strategy which describes the main climate change impacts, the existing adaptation responses, a roadmap to a future National Adaptation Plan (NAP) and several policy guidelines for the further development of adaptation policy. The Strategy has 3 objectives:

- improve consistency between existing adaptation activities in Belgium (evaluation of the impacts of climate change, vulnerability to climate change and adaptation measures already implemented);
- improve communication at national, European and international levels;
- initiate a process for the preparation of a national action plan. ■

Decision-making in Belgium

Belgium is a federal State composed of three language-based communities (the Flemish Community, the French Community and the German-speaking Community) and three regions (the Flemish Region in the North, the Brussels-Capital Region in the centre and the Walloon Region in the South), each with its own executive and legislative bodies.

Constitutional reforms and the regionalisation of the State have led to a three-tiered organisation:

- the upper tier comprises the federal State, the communities and the regions, all equal by law. They intervene on an equal footing but in different areas.
- the middle tier comprises the 10 provinces. They act within the framework of the federal, community or regional powers and are subordinate to all higher authorities.
- the lowest tier of the structure comprises the municipalities (589 in all), which are the level of power closest to the citizen. Like the provinces, they are subordinate to the higher authorities. Depending on the area of power being exercised, they are therefore accountable to the Federal Government, the community or the region. They are financed and controlled primarily by the regions.

It is important to stress the specificity of the Belgian context: competences are either exclusively attributed to the federal or regional level, or shared between these two entities. The federal level is also responsible for competences that are not expressly attributed to the regions or the communities. The position taken up by Belgium at European or international level is constructed on the basis of input from all these entities. When we speak about 'national level policy documents', we mean those that are adopted and supported together by the various entities responsible.

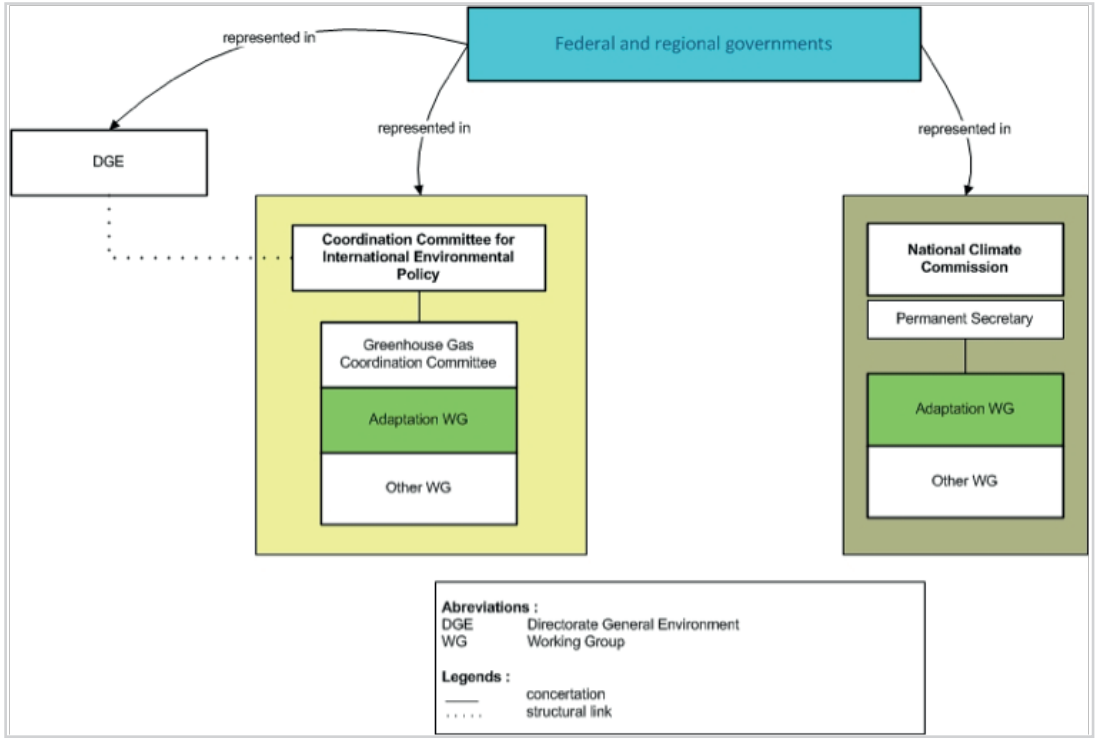
Federal	Regions	Communities
Broadly speaking, responsible for:foreign affairs, the army, large energy infrastructures and nuclear energy, economic regulation, the judicial system, public finances, social security, State-owned companies (such as Belgian Railways), substantial parts of public health and home affairs, …	Responsible for areas related to occupation of a 'territory': economy, employment, agriculture, water policy, housing, public works, energy, transport (with the exception of the national railway, SNCB/NMBS), environment, town and country planning, rural revitalisation, nature conservation, credit, foreign trade, and provincial, municipal and inter-municipal administration.	Responsible for matters related to 'persons': culture, education, languages and matters that can be 'personalised': health policy (preventive and curative medicine) and assistance to individuals (child protection, social assistance, family assistance, receiving immigrants, etc.).
Also responsible for scientific research and international relations in the above-mentioned areas.	Also responsible for scientific research and international relations in the above-mentioned areas.	Also responsible for scientific research and international relations in the areas under their authority.

Various coordination bodies have been set up to harmonise and create synergy between the climate policies pursued by the Federal Government and the three regions:

The Coordination Committee for International Environmental Policy (CCIEP) CCIEP is the main body responsible for coordinating Belgian international environmental policy. The CCIEP was established and became fully operational in 1995. It systematically reviews the relationship and overlaps between international agreements, and is responsible for coordination and consultation activities to ensure vertical and horizontal integration regarding environmental policy. It also makes decisions regarding Belgium's international environmental policy. The Adaptation Working Group under the CCIEP monitors and discusses European and international decisions in relation to adaptation which may have national consequences or carry obligations (such as the EU Strategy on Adaptation).

The Directorate-General Coordination and European Affairs (DGE) plays a pivotal role, providing coordination for monitoring Belgium's European policy, and consulting and collaborating with the partners of the federal and federated entities. It approves Belgium's positions for meetings of the Council of the European Union.

The National Climate Commission (NCC), established in 2003, is responsible for a number of tasks related to the national implementation of climate policy. Its central responsibilities are implementing and monitoring the National Climate Plan, monitoring and adapting the Plan's policies and measures, collecting and exchanging data and preparing mandatory reports. The National Climate Commission can also advise the CCIEP regarding international policy on climate change and greenhouse gas emissions. It is made up of four representatives per entity (four for the federal government and four for each of the three Regions), appointed by their governments. It is assisted by a permanent secretariat and thematic working groups which are mandated by the National Climate Commission to address different issues. An Adaptation Working Group was created under the NCC. This group brings together adaptation operators from the regional and federal governments (the NCC Adaptation Working Group and the Adaptation Working Group under CCIEP are composed of the same experts). Its responsibilities include drafting this National Adaptation Plan.



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The NCC Adaptation Working Group was mandated to draft this NAP in order to:

- provide clear and concise information about Belgian adaptation policies (at regional and federal level) and their implementation;
- identify national adaptation measures that will strengthen cooperation and develop synergies between the various governments (federal, regions). ■

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2. Climate change

As stated by the IPCC in its 5th assessment report (2013): "**Warming of the climate system is unequivocal**, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased. […] Most aspects of climate change will persist for many centuries even if emissions of CO_2 are stopped. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO_2."

Climate change is already occurring and more impacts are expected for the future. To be ready to adapt to these impacts, we have to understand the processes underway in order to project what will happen in the future.

According to the IPCC's 5th Assessment Report, the **earth's combined land and ocean surface temperature** shows a warming of 0.85 [0.65 to 1.06]°C for the period 1880-2012, and the number of hot days and nights has increased over most land areas. **Sea level** rise since the mid-19th century has been greater than the mean rate over the previous 2,000 years.

With the **Paris Agreement**, the international community has fixed a goal of "holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels". However, the 'Nationally Determined Contributions' (NDC) of the Parties to the Paris Agreement, in their present state, do not allow this objective to be reached. Even if fully implemented, those commitments will limit temperature increase to between 3.0°C (conditional commitments) and 3.2°C (unconditional commitments) by 2100[1].

In Europe, 2014 was the hottest year on record. The analysis of the values observed indicates that the annual (January to December) mean temperature for Europe reached 11.22°C, which is nearly 0.17°C above the previous record set in 2007. The Top 10 warmest years were all in the past 15 years, with 1989 the only exception, at fifth place (Climate Indicator Bulletin, EURO4M project[2]).

"More knowledge is always good, more action would be even better. When the alarm goes off, many just hit the snooze button. This does not work anymore when it comes to climate. It's time to wake up and bring action to the scale needed. […]"

IPCC Working Group II launch,
Connie Hedegaard, March 2014.

[1] UNEP (2016). The Emissions Gap Report 2016. United Nations Environment Programme (UNEP), Nairobi.

[2] http://cib.knmi.nl/mediawiki/index.php/2014_warmest_year_on_record_in_Europe

In Belgium, a large amount of climate modelling work has already taken place and will continue in the future. The publication of a number of climate change simulations[1] has provided valuable information. Key elements from the latest climatic projections are presented below:

- **A hotter climate**: all the projections show an increase of temperature in all seasons (1.5°C to 4.4°C for winter and 2.4°C to 7.2°C for summer by 2100).
- **Increased seasonality of precipitation**: precipitation is expected to decrease in summer (up to -25% by 2100) and increase in winter (up to 22% by 2100). Results for annual precipitation are contrasted: either a decrease or an increase depending on the model used.
- **More extreme events**: heavy rains in winter and heavy thunderstorms in summer are expected to be more frequent and/or more intense, and heat waves are expected to be more frequent in summer.
- A fall in the average summer precipitation, in combination with greater evaporation, will cause **the lowest river flows to fall** during dry summers by more than 50% by the end of the 21st century. As a result, the risk of a serious water shortage also increases.
- **The sea level** at the Belgian coast **may rise** by 60 to 90 cm by 2100 with a worst-case scenario of 200 cm.
- Expected increase in the phenomenon of **heat islands** in urban areas. ■

[1] See references 5, 8, 9, 10 11 and 12 of this plan; see also Ntegeka V., Willems P., 2009. "CCI-HYDR Perturbation Tool: a climate change tool for generating perturbed time series for the Belgian climate", Manual version January 2009, K.U.Leuven – hydraulics Section & Royal Meteorological Institute of Belgium, 7 p. (click here); Brouwers, J., Peeters, B., Willems, P.,Deckers, P., DeMaeyer, Ph., DeSutter, R., en Vanneuville, W. (2009),'Klimaatverandering en Waterhuishouding', pp. 283-304 in: Van Steertegem, M. (red.), Milieuverkenning 2030. Flanders Environment Agency.

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3. Impacts and vulnerabilities in Belgium

As climate change accelerates, severe impacts are anticipated for natural ecosystems (including substantial losses of biodiversity). Furthermore, future climate change is projected to slow down economic growth, erode food security, and increase global inequalities.

Impact, vulnerability and adaptation assessments have been conducted at regional and federal level. This was the first step before developing the regional and federal adaptation plans. The climatic projections used in these assessments were similar and coherence was ensured. However, studies conducted by the different authorities focused on different aspects, in relation to their own specificities (e.g. sea level rise in Flanders, urban area in Brussels, impact on forestry in Wallonia and other specific aspects at Federal level). The results of these studies conducted by the different authorities can be consulted on their respective websites (*LNE, Bussels Environment, AwAC, BELSPO,* Climatechange.be) or in the Circle 2 ERA-net infobase (http://infobase.circle-era.eu/search.jsp). ■

Sectors

Various sectors will face very different impacts. A brief description of the major impacts and vulnerabilities is given in table 1 for the various sectors affected by climate change in Belgium (the table is adapted from the different regional vulnerability studies mentioned above). The top of the table gives an idea of the uncertainties surrounding this data by using different projections: wet, mean or dry[1]. Detailed information on sectoral impacts can be found in the regional and federal adaptation plans (table 2 indicates which sector is tackled at regional, federal and national level).

Climate change will affect multiple sectors, with possible waterfall effects. Different sectoral and inter-sectoral adaptation measures have been identified at national, federal and regional level. The identification of key sectors was based on risk and vulnerability assessments as well as competence sharing between the different entities in Belgium. ■

[1] The "wet" climate projection results in an increase in the level of precipitation, leading to high run-off discharges, high water levels in rivers, flooding, high soil water and groundwater levels in winter.

The "mean" projection scenario has an intermediate position in terms of rising temperatures and rainfall change.

The "dry" climate projection results in low river flows, low soil water and groundwater levels during dry summer periods and faster warming.

Table 1

Summary of the main impacts and their expected severity in Belgium (adapted from regional impact assessment studies).
The top of the table gives an idea of the uncertainties surrounding this data:
the change in temperature will be of varying speed and extent depending on the projection used.

Wet Projections		2030	2050	2085				
Mean Projections		2030	2050		2085			
Dry Projections				2030			2050	2085
Temperature rising (°C)	0,5	1	1,5	2	2,5	3	3,5	4
Agriculture	↗ in erosion risk due to heavy rain ↗ in loss of soils due to heavy rain Variability of crop production and breeding (↗ in the frequency of extreme events) ↗ pressure from diseases, parasites, weeds and invasions ↗ in water needs and risk of water stress ↗ in yields or production of certain crops Limiting factors (photoperiod, water, fertility) and reversal of the trend							
Coastal Areas	↗ risks of breaking of natural (mostly sand and dunes) coastal defences ↗ risks of breaking of man-made (dykes, wave-breakers, ...) coastal defences ↗ risks of higher storm-related flooding damage caused by changes to wind patterns anw wave height reduction of upper layer of fresh water in polders (salt intrusion) affecting natural systems and infrastructures							
Fisheries	changes in the quantity and distribution of marine species, inclusive commercial fish stocks Appearance of new commercial species (migration from south to north) appearance of new harmful species ↗ vulnerability of highly specialised fishery sector							
Land planning / Infrastructures	↗ in flood risk Risk of disruption to transport by waterways (more low-water periods) Impact of heatwaves and amplification by heat islands damage to infrastructure due to high temperatures (buckling of rails, etc.) Risk of disruption of road and rail transport and damage to infrastructure due to snow and frost Shrinkage and swelling of clay Karstic Risk Damage due to the possible increase in storm frequency							
Forests	Modification of the range of forest species (harmful to wood production) More frequent invasions ↗ in damage due to climatic variations (fire, storms, droughts) frost damage ↗ frequency of outbreaks ↗ growth followed by limited increase due to soil fertility and drought Changes to phenology							

Wet Projections		2030	2050	2085				
Mean Projections		2030	2050		2085			
Dry Projections				2030			2050	2085
Biodiversity	Added pressure on already vulnerable areas (peatlands, etc.) changes in distribution areas Increase in invasions Phenological changes							
Energy	↗ in energy consumption (cold chain/ air conditioning in summer) Integrity and capacity of production and transport installations Problem of cooling of nuclear plants 1 Management of the network and electricity consumption 2 ↘ in heating-related energy consumption Seasonal modifications of photovoltaic, wind and hydraulic production and biomass productivity							
Health	↗ in mortality due to heatwaves and diseases linked to food contamination ↗ of respiratory diseases and allergies (pollens..) ↘ mortality in winter Sanitary risks due to air quality (summer) sanitary risks due to air quality (winter) ↗ in diseases linked to water contamination ↗ in vector-borne diseases							
Water Resources and Management	Pollution of ground water by leaching Decrease in surface water quality (floods, streaming, low-flows) Variation in river flows can lead to pollution increased rainfall in winter recharges grondwater Reduction of ground water in summer							
Tourism	Longer periods of favourable conditions for low-season tourism Favourable conditions for summer tourism but risks for nautical activities during dry summers Energy consumption for heating Energy consumption for cooling							
Industry & services	Impact on production processes (e.g. water shortages, cooling of power plant, etc.), direct (flooding, high winds, etc.) and indirect (supply problems) damages More frequent and/or intensive weather-related disasters will challenge insurance systems							

Legend

very serious
serious
not very serious
opportunities
impact difficult to assess

1. Changes to the facilities (complete closure of Tihange site expected in 2025) should significantly decrease the pressure on surface water. Note: there is also a risk in inter-connected facilities and a direct risk in Wallonia.

2. The changes to the facilities will lead to changes in electricity management methods (very high costs)

123rf/Guidella

Table 2. *Sectors/thematic areas addressed in federal, regional and national adaptation action plans*

	Federal	Flanders	Wallonia	Brussels	National
Agriculture		✓	✓		
Biodiversity		✓	✓	✓	✓
Built environment		✓		✓	
Coastal areas		✓			
Crisis management	✓	✓			✓
Energy		✓		✓	✓
Environment		✓	✓[2]	✓	
Fisheries		✓			
Forests		✓	✓	✓	
Health		✓	✓		✓
Infrastructures	✓[1]	✓		✓	
Industry & services		✓			
Research		✓	✓		✓
Tourism		✓	✓		
Transport	✓	✓			
Water management		✓	✓	✓	
International cooperation	✓[3]		✓		✓
Transversal issues	✓	✓	✓		✓

[1] The Federal contribution to the National Adaptation Plan addresses transport infrastructures.

[2] The Walloon plan addresses environment through its sections on water, forests and biodiversity, but does not contain a separate section as such.

[3] The Federal contribution to the National Adaptation Plan addresses transnational cooperation under 'Crisis management'). The full list of the measures of the different plans is provided in the annex.

De Vlaamse Waterweg nv

4. Adaptation planning at regional and federal level

The regional governments and the federal government have adopted adaptation plans, each in their own area of competence:

At Flemish level

In 2013, Flanders adopted the **Flemish Climate Policy Plan**. It includes a section on adaptation known as the **Flemish Adaptation Plan (VAP)**. An English summary is available.

This plan focuses on how the Government of Flanders intends to respond and when it will act.

The primary goals are:

1. understand the Flemish vulnerability to climate change;
2. improve Flanders' ability to defend itself against the effects of climate change.

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

Together with the secondary goals, this forms the basis for defining actions. Actions must be cost-effective.

In the VAP, 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. But 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 of climate change without preparation or taking late and more draconian action. The measures must therefore be taken at the appropriate time.

One important starting point in the Flemish adaptation policy is that of improving resilience. For certain adaptation challenges, Flanders will make use of ecosystem services. These and other adaptation measures will be robust no-regret measures, will be one of the drivers of technological innovation and will include the sustainability principle.

The VAP mainly has a regional focus. The departments maintain responsibility for the actions in their policy domain and will bear the cost of these actions using their usual financial resources. Local adaptation policy is in the start-up phase. In 2015, Flanders published a first 2013 – 2015 progress report on climate change, including a section on adaptation.

At Brussels level

On 2 May 2013, the Brussels-Capital Region adopted its Air-Climate-Energy Code (known as COBRACE) which, as its name indicates, includes all the Region's policies with an impact on climate, air quality and energy management. It serves as a legal basis for its **Integrated Air-Climate-Energy Plan** which was adopted on 2 June 2016 and includes a section on adaptation. The Brussels-Capital Region already has thematic plans which include adaptation measures.

In 2017, it adopted a new **regional water management plan** for the period 2017-2021 (which follows its first plan from 2012). This plan includes an integrated and global approach to all the challenges related to water management. It provides, inter alia, measures to stimulate sustainable water use and to restore the Region's hydrographic water network. This plan also includes measures to prevent and manage flood risks. Preventive measures can help ensure that the built environment is better adapted to increased precipitation, both in terms of improved soil infiltration and short-term water retention on plots of land (limits in built-up areas, choice of permeable materials, plants and green roofs, etc.). The Region has adopted the **"Forêt de Soignes" management plan** which includes measures to preserve or improve the forest's regenerative capacity and help it adapt to environmental change.

At Walloon level

In January 2014, the Walloon government adopted its "**Climate Decree**" giving a legal framework to climate policy in Wallonia. The main implementation instrument is the "**Air-Climate-Energy Plan**" which contains a specific section on adaptation. This section summarises the impact and vulnerability assessments and sets out detailed adaptation actions in several sectors. Water management (through the PLUIES plan against floods and the flood portal), forest management and monitoring guidelines (through the Forest Code & the Observatory of forest health) and agricultural advice (by the scientific cell GISER working together with municipalities and farmers) are some examples of these actions. The draft plan was submitted to a public survey in summer 2014 and was adopted in April 2016. More information is available on the Walloon Agency for Air & Climate Website (www.awac.be).

At federal level

The **Federal contribution to the National Adaptation Plan** was adopted on 28 October 2016.

This contribution identifies federal adaptation actions to meet the following needs in a transversal way:

- build capacity, in order to assess, anticipate and respond to the risks associated with climate change impacts (increased knowledge)
- anticipate and mitigate risks and maximize the potential benefits of climate change.

More information is available on the climate website of the Federal Public Service Health, Food Chain Safety and Environment (http://www.climatechange.be).

At national level

These plans and contribution identify the different adaptation actions that will be taken by each specific region and by the federal government.

This national adaptation plan identifies specific adaptation measures that need to be taken at national level in order to strengthen cooperation and develop synergies between the different entities (federal, regions) on adaptation.

The process which led to the identification of these measures was based on an analyse of:

- the measures contained in the adaptation plans (three regions and the federal) to identify the gaps and/or the opportunities for synergies
- the EU adaptation framework (in particular the EU Adaptation Strategy and its accompanying documents)
- a study exploring first drafts of national adaptation actions which can be implemented jointly by the federal and regional authorities.

Based on this analyse, the Adaptation Working Group of the NCC identified a set of measures. Their relevance and feasibility were analysed, in consultation with the relevant sectoral experts, following criteria such as the opportunity for implementation (focusing on the integration of adaptation into planned sectoral projects/process), the national added-value (meaning that the measures are beneficial to all four entities) and the urgency of action. ■

5. National actions

Most adaptation initiatives will be undertaken by local, regional or federal authorities in the context of their own climate policy. National measures aim to complement these measures by promoting greater coordination and information-sharing between the authorities.

The National Adaptation Plan describes national measures for the next few years, covering the period 2017-2020.

For each national measure, information is given on:

- the entity(ies) in charge (e.g. responsible for implementation and financing – where needed)[1];
- the actors involved in the implementation (non-exhaustive list - consultations with all relevant stakeholders will take place as appropriate);
- an initial estimation of the budget (where appropriate);
- the planning. ■

[1] The designation of "responsible entities" does not interfere with competence sharing.

[2] Cordex is an international initiative for the global coordination of climate downscaling initiatives at regional level (Regional Climate Downscaling) to enable better regional assessments relating to climate change impacts and adaptation to this phenomenon.

Measure 1

Development of high resolution climate scenarios for Belgium

Budget. — €1.2 M for 2 years (BRAIN budget, 2014 call)
Entity responsible for the measure. — NCC
Timing. — 2017

Goal. — These new climate scenarios must be based on the latest information (emission scenarios, RCPs- *Representative Concentration Pathways* - and models) available in the IPCC report (AR5) and CORDEX[2] and adapted to the general needs of potential users in Belgium. These scenarios can then be used as the national reference for future impact and vulnerability assessments.

Description. — Climate scenarios play a key role in the development of the adaptation policy.

The magnitude of climate change in Belgium will differ according to the regions and the seasons, and will depend on future emissions of greenhouse gases.

In order to best anticipate the future impacts of climate change and to assess risks for the different sectors, it is important to have coherent, high resolution climate scenarios, adapted to the needs of the different sectors, with different timescales and geographic scales for our country. For users, uncertainties have to be quantified as well as possible.

Currently, three types of climate scenario exist in Belgium: those developed by RMI (Aladin high resolution model), those developed in the framework of the CCI-HYDR project (SSD programme) with RCMs (regional climate models) from the EU project PRUDENCE and those developed in the framework of the MACCBET project (CCLM - COSMO-Climate Limited-area Modelling) (SSD programme).

These scenarios do not take into account the new scenarios used in the 5th IPCC Assessment Report (the RCP – Representative Concentration Pathways) and their integration in the international context, such as Cordex and ISI-MIP-2.

At federal level, a 'scenario platform' was created in 2013, bringing together the most impor-


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tant scientific players in the field to exchange information and develop coherent scenarios.

In Flanders, the VMM (Flanders Environment Agency) financed the development of new scenarios which will take into account the latest IPCC findings (AR5).

The development and further refinement of coherent climate scenarios for Belgium, which take into account the needs of potential users as far as possible, will serve as a reference in Belgium for the impact and vulnerability assessments in the different sectors.

Justification of the national character. — The creation of national climate scenarios will provide more coherence at national level. These scenarios contribute to the development of the national knowledge base. It will make optimum use of the work done in the different Belgian universities and research centres and bring together the existing information (e.g. former climate projections, historic RMI records, etc.)

As stated in the National Adaptation Strategy "*centralised and coordinated initiatives are needed, especially in the areas of monitoring, research and the sharing of information, to make these results understandable for policy use*."

Actors involved. — BELSPO, scientific institutions and universities involved in the development of regional climate scenarios (RMI, KULeuven, UCL, ULg, VITO, BIRA-IASB, ORB-KBS, KMMA-MRAC), representatives from Federal and regional administrations and other stakeholders/potential users.

Indicator. — Use of the results by the scientific community, climate service providers and users and policy makers (at different levels); contribution to the CORDEX, an international initiative which is providing global coordination of Regional Climate Downscaling for improved regional climate change adaptation and adaptation assessments. ■

Measure 2

Development of a roadmap for a Belgian Centre of Excellence on Climate

Budget. — For the development of the roadmap: no specific budget needed.
Entity responsible for the measure. — NCC
Timing. — Roadmap: 2017.

Goals. — Define the process for the development of a centre of excellence on climate

Description. — Belgian scientific expertise on climate is scattered over different universities and scientific institutions. A structural interaction between the different research entities needs to be created in order to better capitalise on this expertise both at national and international level.

Such an initiative would make it possible to conduct state-of-the-art scientific research on climate and related environmental and economic issues, and to collect, summarise and disseminate cutting-edge objective and authoritative information on a broad spectrum of climate-related issues.

This would facilitate networking between Belgian research teams in different institutions, between national and regional service initiatives, and between domestic and international research programmes including European programmes. Regional climate service providers could benefit from the data and information provided to them.

A Climate Centre of Excellence could have a twofold role:

- research: encourage high level applied and fundamental research on climate and earth system sciences (including socio-economic aspects) through synergies between federal and regional research institutions and universities.
- service: through a dialogue with stakeholders (public service and corporate world), the CCE will share authoritative science-based information that is directly usable for developing policies and the appropriate good practices in the areas of mitigation and adaptation.

A feasibility study, conducted in 2014-early 2015, has provided recommendations on the development of such a centre of excellence. These recommendations will be used to examine how such an initiative can be realised. A roadmap for its possible implementation will be developed by BELSPO in concert with the scientific institutions and the relevant regional and federal players.

Justification of the national character. — This centre will provide a structure for collecting scientific expertise and knowledge at national level and providing information on the expected impacts of climate variability and climate change in Belgium. It will initiate a dialogue with users and serve as a centre of reference to support the Federal and regional agencies and service providers that advise federal, regional and local public authorities and economic players, including downstream climate services.

Actors involved. — BELSPO, Federal and regional research institutions, regional agencies, decision-makers on the different policy levels (climate policy and scientific policy), stakeholders.

Indicator. — Finalisation of the roadmap. ■

Measure 3

Development of a national online platform for climate adaptation

Budget. — €12,000 – 25,000 + man-hours for updating (covers the creation, maintenance, hosting and updating of the website.)
Entity responsible for the measure. — NCC
Timing. — 2017-2018

Goal. — To create a national database to share and give access to all the information available dealing with climate change impacts, vulnerability assessments and adaptation in Belgium (research projects, best practice, guidance, plans and programmes...).

Description. — As stated in the National Adaptation Strategy (NAS) "*making the information available for end users through a climate information system is an important consideration*".

To increase public awareness in general and the involvement of professionals in particular, information must be transparently available and experiences need to be shared easily.

A central online platform will be created where both general information on climate adaptation is provided for the general public and specific information is centralised. Different levels of information are possible (general for the lay person, greater detail for "professionals"):

- relevant strategy documents (National Adaptation Strategy, regional and federal action plans);
- climate scenarios;
- vulnerability and impact assessments;
- existing studies and reports related to climate adaptation;
- monitoring data;
- disaster risk management/crisis management;
- how to communicate on adaptation, vulnerabilities and uncertainties;
- raising awareness among specific target groups, for example mayors;
- results of research programmes related to climate adaptation, discussion for a;
- best practice;
- …

The target groups are administrations (federal-regional-local), businesses, NGOs, citizens and the academic sphere.

The platform will link to other relevant platforms (ex: EU Climate-ADAPT/biodiversity clearing house mechanism/adaptation platforms of other countries).

Justification of the national character. — his platform will make it possible to gather information on the expected impacts of climate change in Belgium and the adaptation actions taken (or planned). It will be the national link between the European (and international) level and the federal, regional and local levels (levels of concrete action). If regional/federal platforms exist (or will exist), the national platform will provide the necessary links. It will be listed on the Climate-ADAPT web portal as the entry point for Belgium. The development of a national web portal is one of the indicators selected by the European Commission scoreboard to evaluate the level of Member States' preparedness for climate change.

NB: several European countries have already developed a similar national adaptation web platform (Austria, Denmark, Finland, France, Germany, Hungary, Ireland, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, UK).

Actors involved. — FPS Public Health, Food Chain Safety and Environment ("Climate change" unit)/LNE/AWAC/ Environment Brussels / BELSPO – scientific institutions/ KMI/other administrations, stakeholders.

Indicator. — Creation of the platform; number of visits/statistics. ■

Measure 4

Strengthening sectoral coordination at national level

Budget. — €10,000 (price of one symposium per year)
Entity responsible for the measure. — NCC
Timing. — Continuous

Goal. — Setting up of an integrated vertical and horizontal coordination structure.

Description. — Inter-sector taskforces exist at regional and federal levels (or are being created). Coordination also exists between regional and federal institutions. It seems useful to strengthen horizontal and vertical coordination by bringing together sectoral experts from the local, regional and federal entities to exchange expertise, projects in development, etc.

This coordination may take the form of thematic round tables. Every year, a specific will be addressed and the relevant actors (involved at federal, regional, provincial and local levels) will be invited. Sectoral coordination in terms of adaptation to climate change may be strengthened on the following themes in particular: transport, disaster management, health, energy, agriculture, etc.

Justification of the national character. — Coordination of the sectoral initiatives taken at regional/federal level.

Actors involved. — Regional/federal/local sectoral authorities, stakeholders, scientists

Indicator. — number of symposiums organised; number of participants; satisfaction of participants. ■

Measure 5

Take climate change into account in risk analysis for invasive alien species

Budget. — /
Entity responsible for the measure. — Interministerial Conference for the Environment (through its Invasive Alien Species working group)
Timing. — 2017-2018

Goal. — The goal is to reflect the influence of climate change on invasive alien species in the tools that support decision-making regarding these species. Indeed, climate change can facilitate the arrival and spread of invasive species through different processes:

- new species that may become invasive will appear/move northwards due to climate change.
- interactions between species will change (presence/absence of predators, relationships with symbiotic hosts, interactions with competitors, etc.), which can facilitate the establishment of invasive species as well as qualitatively and quantitatively modify their impacts.
- climate-induced stress in an ecosystem can facilitate the establishment of invasive species
- adaptation responses such as adaptive management in forestry and agriculture (introduction of new species/speculations better adapted to future climate change) may create new pathways for the introduction of invasive species.

Description. — Future climate conditions may affect the invasive behaviour of alien species. These must therefore be taken into account when assessing the risks associated with invasive species through the use of an assessment protocol and the subsequent listing of priority species. Climate change considerations will be included in these risk assessments through the "Harmonia +" protocol to ensure that risks linked to present and future climate (in the medium term) will be considered. This will be explicitly stated in the new version of the Harmonia + protocol.

The list of invasive alien species in Belgium[1] will be re-evaluated and adapted, if needed.

At European level, a regulation on invasive alien species was adopted in September 2014[2] and entered into force on 1st January 2015. This legislation seeks mount a comprehensive response to invasive alien species so as to protect native biodiversity and the ecosystem services, as well as minimise and mitigate the impacts that these species can have on human health and the economy. The legislation foresees three types of intervention: prevention, early warning and rapid response, and management. A list of 37 invasive alien species of concern to the Union was recently drawn up with Member States based on risk assessments and scientific data[3]. It should be noted that this list is dynamic and will consequently come to include more species.

In the framework of adaptive management, where new species (better adapted to future climate conditions) are introduced intentionally, a preventive risk assessment needs to be carried out in order to identify the potential impacts of with their introduction.

[1] Not applicable in the framework of plant protection policy (existence of a harmonised EU list of pests of plants).

[2] Regulation (EU) N° 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.

[3] The draft new regulation on Animal Health includes provisions on animal diseases, the new regulation on protective measures against pests of plants provides rules for pests of plants, and Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC sets out the regime applicable to genetically modified organisms. Therefore, the new regulation on invasive alien species is in line with but does not overlap with these Union acts and does not apply to the organisms targeted by those acts.

For species that satisfy the risk assessment and are therefore introduced, detailed monitoring must take place through field trials (post-entry evaluation).

Justification of the national character. — Consideration of adaptation in the instruments developed at federal level and used in the three regions and at a federal level to establish their policy.

Actors involved. — Federal and regional authorities/Belgian biodiversity platform, CABAO (climate information, medium term: by 2050), CIMES (via the "Environment and Health" unit for human health issues)

Indicator. — Number of assessments of invasive species that take climate change into account. ■

Measure 6

Evaluate the impact of climate change on the security of the energy supply and the energy transport and distribution infrastructures

Budget:. — To be discussed in CONCERE
Entity responsible for the measure. — CONCERE
Timing. — 2018-2019

Goal. — To guarantee the security of the electricity supply by developing knowledge about the impacts of climate change on this sector and by raising awareness of threats caused by climate change.

Description. — A proposal will be put forward for a joint stud supported by a working group under CONCERE. The goal will be to assess the impact of climate change on the security of the energy supply and energy transport and distribution infrastructures in order to strengthen the coherence between the regional governments and the federal governments; this will be done by coordinating and improving energy knowledge within and between these different authorities. The members of this working group will be experts from the authorities, the relevant sector and research institutions. This study will provide recommendations for measures to improve the sector's resilience against the potential negative consequences of climate change.

Justification of the national character. — Mixed competences, cross-border impacts

Actors involved. — CONCERE/BELSPO/ IWT/ELIA/ Network Manager /FEBEG/ universities/stakeholders…

Indicator. — Creation of a working group and launch of a study. ■

Measure 7

Evaluation of the socio-economic impacts of climate change in Belgium

Budget. — €70,000
Entity responsible for the measure. — NCC
Timing. — 2018

Goal. — To carry out a global analysis of the socio-economic impacts of the climate change to determine Belgium's level of readiness to tackle climate change and identify the sectors, businesses and categories of workers that will be the most affected and in which way.

Description. — A joint study will be conducted to analyse and evaluate the socio-economics impacts of climate change in Belgium. The existing regional studies will be used as background. This joint analysis may also be based on the new climate scenarios developed at national level.

Justification of national character. — It is important to know the level of preparedness and to evaluate the impacts of the threat of climate change in Belgium as well as in particular sectors, so that greater attention can be paid to these sectors.

A joint study will guarantee national coherence with regard to the scenario-based hypothesis and to the sectors for which the entities are responsible.

Actors involved. — NKC/NCC (CABAO), stakeholders

Indicator. — Results of the socio-economics impacts analysis. ■


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Measure 8

Take climate change impacts and adaptation needs into account in the framework of the future National Environmental Health Action Plan (NEHAP)

Budget. — /
Entity responsible for the measure. — National health and environment unit
Timing. — 2017

Goal. — To reflect the strong links between climate change and health in environmental and health policy.

Description. — The document 'Adaptation to climate change impacts on human, animal and plant health' [14] published by the European Commission highlights the main effects of climate change on human, animal and plant health and describes the potential evolution of European Commission action to tackle these impacts.

Climate change affects human health directly (heatwaves, extreme climate events, etc.) and indirectly (forced migration, increasing amount time spent outside, increased use of cooling systems, etc.).

It aggravates environmental problems by causing droughts, heatwaves, floods, storms and forest fires and by encouraging new or more virulent forms of disease (human, animal or plant).

Since health and well-being are also closely linked to socio-economic factors (income, housing, employment, education, lifestyle, etc.), the effects of climate change will probably accentuate health inequalities within and between countries, increase the vulnerability of low-income groups and groups such as children, persons working outside the home, the elderly and those already sick.

The European Environment and Health Action Plan 2004-2010[1] specifically addressed climate change and human health under Action 8 and foresaw the identification of emerging environment and human health issues. No follow-up programme has been set up on this issue.

The interrelations between health, the environment and climate change will be taken into account, from an adaptation perspective, in the national environment and health plan. This measure will be based on the existing literature on climate change and health (IPCC reports, WHO publications, European Environment Agency, European Commission, climate scenarios, risks assessments, etc.).

Justification of national character. — NEHAP is a comprehensive tool for planning and implementing environmental health actions at national level.

Actors involved. — NCC (CABAO), stakeholders

Indicator. — Percentage of climate-related projects identified in the NEHAP. ■

[1] Available at: http://europa.eu/legislation_summaries/public_health/health_determinants_environment/l28145_fr.htm.

Measure 9

Education and awareness-raising among health professionals on the subject of climate change impacts

Budget. — €45,000 (for the whole project, budget approved in 2014)
Entity responsible for the measure. — National health and environment unit
Timing. — From 2017 (recurrent)

Goal. — Increase awareness among health professionals of the short- and long-term impacts of climate change on health systems and health care provision.

Description. — At global level, climate change is expected to cause approximately 250,000 additional deaths per year between 2030 and 2050; 38,000 due to heat exposure among the elderly, 48,000 due to diarrhoea, 60,000 due to malaria, and 95,000 due to childhood malnutrition (WHO).

The European ClimateCost project has estimated that 1,500 additional deaths per year will be caused in Belgium in 2050 by the heat. A Belgian study has estimated that the additional cost of the increase in diseases due to higher temperature could be more than one million Euros in Belgium [19].

A project to train health professionals in health and the environment (basic training, ongoing training, certifications), will make it possible to train new students and qualified professionals ("Environment and health professionals") in the close links between the environment and health. In this context, the impacts of climate change on health and environment will be specifically addressed in certain training e-modules, such as those on health and society or infectious diseases.

Justification of national character. — This measure allows responsibilities to be shared between the regions, the communities and the federal level in the context of the National Environment and Health Action Plan.

Actors involved. — Communities, higher education, INAMI, health professionals

Indicator. — Number of persons registered for the training modules; degree of integration into basic education programmes. ■

Measure 10

Promote transnational cooperation on adaptation

Budget. — /
Entity responsible for the measure. — NCC
Timing. — 2017-2018

Goal. — To facilitate transnational cooperation on adaptation, covering both international cooperation between (neighbouring) countries and cross-border cooperation among countries with shared cross-border resources (e.g. water, protected areas) or other shared interests.

Description. — Transnational cooperation aims to increase the cross-border coherence of adaptation policies, but can also be a way to learn and exchange good practice.

The EU Adaptation Strategy stresses the need to consider cross-border issues in national adaptation policies as well as in impact and vulnerability assessments.

Transnational adaptation cooperation already exists on the ground, e.g. in cross-border river basins (International Commissions of the Meuse and the Escaut) or catchment management areas covering several countries, in the area of biodiversity conservation, etc. as well as in Interreg programmes (e.g. Scaldwin, AMICE, future cities).

A Benelux partnership will be investigated, in particular to analyse cross-bounder risks and the knock-on risks from the transport, energy, health and crisis management sectors.

Justification of national character. — Cross-border issues (such as coastal management, crisis management, disaster risk reduction, etc.) call for transnational alliances.

Actors involved. — To be determined

Indicator. — Number of projects on transnational cooperation. ■

Measure 11

Coordination of preventative, planning and management measures in the event of emergency climate change situations

Budget. — /
Entity responsible for the coordination of the measure. — The Federal Public Service Internal Affairs (Directorates General Crisis Centre and Civil Security)
Timing. — Continuous (as of 2017)

Goal. — In the short term, the aim is to achieve greater consistency between the management and prevention measures for climate-related action/emergency (and response) plans and their coordination, at federal, regional, provincial and local level, by involving the competent authorities for preventative measures in preparatory working groups from the beginning.

In the medium term, the aim is to ensure that climate-related incidents and disasters such as wildfires and floods occur less frequently. If these incidents do occur, the aim is to reduce the damage to people, the environment and infrastructures by taking preventative measures and ensuring good crisis management.

Description. — Climate change will probably increase the frequency and seriousness of certain emergency situations. The procedures necessary to manage these situations are worked out within the context of emergency plans (Royal Decree of 16 February 2006). It is vitally important to also link preventative measures to this planning phase.

When putting together emergency and response plans and/or action plans on the preparation and management of emergency climate change situations, it is necessary to make the link between the prevention aspect and the relevant federal, regional and provincial authorities and discuss the preventative measures required. In concrete terms, with respect to wildfires, the actors responsible for preventative measures (such as forest and nature management units) are involved in the works in the working groups from the outset.

This will help to decrease the number of emergency situations, and to minimise the damage to humans and nature when they do occur. Encouraging the parties involved to take preventative measures against wildfires (for example inspections by fire brigades prior to opening a new nature reserve) or floods will help to reduce environmental damage.

The Federal Public Service Internal Affairs/ Directorate-General Crisis Centre will work with the relevant authorities to take the necessary preventative measures each time new action/emergency plans for the management of emergency situations are prepared. The Governors of provinces will also be encouraged to focus on this prevention aspect when developing their emergency and response plans.

Justification of national character. — Preventative measures and crisis management do not come under the responsibility of the same administrations. Coordination is thus required to link preventative measures to the planning phase. Concrete examples of matters for which this type of coordination is very useful are wildfires and floods.

Actors involved. — The federal and/or regional authorities, Governors of provinces and local authorities depending on the issue

Indicator. — Number of files where there is a link between prevention and crisis management. ■

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6. Monitoring and implementation

The 'responsible entity' identified for each measure will take the necessary steps for its implementation (consultations, studies, budgetary arrangements, planning, monitoring, etc.).

A mid-term evaluation will be conducted by the 'Adaptation' working group and sent to the National Climate Commission by the end of 2018. This will allow the evaluation to be aligned with international (national communication to the UNFCCC) and European ('Regulation on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change' MMR) monitoring and reporting obligations.

The mid-term evaluation will review the progress made in implementing the National Adaptation Plan and will identify strengths and weaknesses in its implementation so that any potential shortcomings can be corrected.

A final evaluation will take place in 2020. It will identify possible 'implementation gaps' and ways to address them. It will also assess whether an update of the National Adaptation Plan is needed.

The table opposite shows, for each measure, the provisional implementation schedule as well as proposed monitoring indicators. ■

	Measure	Timing	Indicator
1	Development of high resolution climate scenarios for Belgium	2017	Use of the results by the scientific community, climate service providers and users and policy makers (at different levels) Contribution to CORDEX
2	Development of a roadmap for a Belgian Centre of Excellence on Climate	2017	Finalisation of the roadmap
3	Development of a national online platform for climate adaptation	2017-2018	Creation of the platform Number of visits/statistics
4	Strengthening of sectoral coordination at national level	continuous	Number of symposiums Number of participants Satisfaction level of participants
5	Climate change taken into account in risk analysis for invasive alien species	2017-2018	Number of assessments of invasive species that take climate change into account
6	Evaluate the impact of climate change on the security of the energy supply and the energy transport and distribution infrastructures	2018 – 2019	A working group has been set up and a study has been launched
7	Evaluation of the socio-economic impacts of climate change in Belgium	2018	Results of the socio-economics impacts analysis
8	Take climate change impacts and adaptation needs into account in the framework of the future environment and health action plan (NEHAP)	2017	Percentage of climate-related projects identified in the NEHAP
9	Education and awareness-raising among health professionals of climate change impacts	From 2017 (recurrent)	Number of persons registered for training modules Degree of integration in basic educational programs
10	Promote transnational cooperation on adaptation	2017-2018	Number of international cooperation projects
11	Coordination of preventative, planning and management measures in the event of emergency situations linked to climate change	rom 2017 (recurrent)	Number of links between crisis prevention and management

Annex

***Summary table** of the measures contained in the Flemish Climate Plan, the Brussels Air-Climate-Energy Plan and the Walloon Air-Climate-Energy Plan, the Federal contribution to the National Adaptation Plan and the National Adaptation Plan, classified by sector*

National Plan	Sector
Measure 1. Development of high resolution climate scenarios for Belgium	Research
Measure 2. Development of a roadmap for a Belgian Centre of Excellence on Climate	Research
Measure 3. Development of a national online platform for climate adaptation	Transversal issues
Measure 4. Strengthening the sectoral coordination at national level	Transversal issues
Measure 5. Take climate change into account in risk analysis for invasive alien species	Biodiversity
Measure 6. Evaluate the impact of climate change on the security of energy supply, the infrastructures of transport and distribution of the energy	Energy
Measure 7. Evaluation of the socio-economic impacts of climate change in Belgium	Research
Measure 8. Take climate change impacts and adaptation into account in the framework of the future environment and health action plan (NEHAP)	Health
Measure 9. Education and awareness-raising among health professionals of climate change impacts	Health
Measure 10. Promote transnational cooperation on adaptation	International cooperation
Measure 11. Coordination of preventative, planning and management measures in the event of emergency situations linked to climate change	Crisis management
Federal Contribution	**Sector**
Measure 1. Take climate change adaptation into account in the Belgian air transport safety plan	Transport
Measure 2. Mapping of rail vulnerabilities	Transport
Measure 3. Take the expected impacts of climate change into account in the long-term planning of railways	Transport
Measure 4. Take the expected impact of climate change into account in the long-term planning of the Marine component of Belgian Defense	Transport
Measure 5. Take the expected impact of climate change into account in risk and impact analysis	Crisis management
Measure 6. Take the expected impact of climate change into account in the crisis management activities of Defense at national level	Crisis management
Measure 7. Enhanced collaboration between member states for crisis management in case of natural disasters	Crisis management
Measure 8. Long term analysis of future extra capacity needs to prepare for crisis management during natural disasters	Crisis management
Measure 9. Address Climate Change Adaptation in federal policy development	Transversal issues
Measure 10. Take climate change adaptation into account in the assessment of NAMAs and CDM	Transversal issues
Measure 11. Organization of sectoral information sessions on climate change adaptation	Transversal issues
Measure 12. Inform on climate change adaptation	Transversal issues

Brussels Plan		Sector
Measure 48.	Adapt water management	Water management
Measure 49.	Adapt infrastructures	Infrastructures
Measure 50.	Develop and adapt the green area in the region	Biodiversity
Measure 51.	Adapt the Sonian Forest management	Forests
Walloon Plan		**Sector**
ADAP01	Building a solid knowledge base that brings together and shares useful information through a single desk and / or information exchange platform	Transversal issues
ADAP02	Establish a list of indicators showing the impacts of climate change in Wallonia	Transversal issues
ADAP03	Continue to tackle soil erosion	Agriculture
ADAP04	Support of monitoring & alert networks on pests	Agriculture
ADAP05	Ensure the problems of heat waves and animal welfare	Agriculture
ADAP06	Evaluate the economic impacts of fluctuations in yields, disaster and other	Agriculture
ADAP07	Continue OWSF assessment and monitoring missions and fill gaps in knowledge	Forests
ADAP08	Encourage initiatives for sustainable silviculture that respects the natural functioning of the ecosystem	Forests
ADAP09	Support and sustain funding for monitoring and alert networks on invasive alien species that can be promoted by climate change	Biodiversity
ADAP10	Maintaining and restoring peatlands and wetlands in Wallonia	Biodiversity
ADAP11	Improve knowledge of impacts and vulnerability at city and municipal level	Transversal issues
ADAP12	Adapt infrastructure renovation / construction taking into account impacts of climate change and linkages to mitigation policy	Infrastructures
ADAP13	Tackling increased flood risk	Water management
ADAP14	Continue efforts to improve groundwater and surface water quality and ensure quality water supply to the population	Water management
ADAP15	Anticipating and fighting against the risks associated with heat waves	Health
ADAP16	Anticipating and tackling other indirect health effects of climate change	Health
ADAP17	Monitoring and anticipation of the evolution and occurrence of pest populations and vector-borne diseases	Health
ADAP18	Continue and improve knowledge, communication, awareness and education on the links between climate change and health	Health
ADAP19	Follow up of the CPDT study	Tourism
INT01	Implementation of bilateral « North South » solidarity projects	International cooperation
INT02	Participation in multilateral funds	International cooperation
Flemish Plan		**Sector**
1.1	Optimization of sustainable water consumption in all sectors	Water management
1.2	Optimization of use of alternative water sources	Water management
1.3	Expansion and optimization of the distribution network (tapwater, grey water, rainwater)	Water management
1.4	Development of a uniform and incentivising grant policy and price structure	Water management
1.5	Remediation and protection of groundwater reserves in drinking water protection zones	Water management
1.6	Remediation and protection of groundwater reserves in other protected areas directly dependent on groundwater	Water management
1.7	Remediation and protection of surface water management in drinking water protection zones	Water management
1.8	Remediation and protection of surface water management in other protected areas	Water management

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)	Water management
1.10	Development and application of a groundwater level and region-specific licensing policy	Water management
1.11	Active water level management	Water management
1.12	Reduction of the effects of water scarcity and drought (e.g. development of low water strategies)	Water management
1.13	Protection or safeguarding of water conservation areas to counter regression of hydraulic regime for body of surface water	Water management
1.14	Legislation and licensing of surface water extraction	Water management
1.15	Banning new flood sensitive developments (Prevention)	Water management
1.16	Removal of constructions in flood sensitive areas (Prevention)	Water management
1.17	Alteration of constructions in flood sensitive areas (Prevention)	Water management
1.18	Other preventive measures including insurance (Prevention)	Water management
1.19	Water retention (Protection)	Water management
1.20	Water storage (Protection)	Water management
1.21	Protection of coastal and transitional waters (Protection)	Water management
1.22	Protection from non-tidal waters (Protection)	Water management
1.23	Ensure safety-based drainage-capacity (Protection)	Water management
1.24	Maintenance measures and rehabilitation of canals (including those with towpaths) (Protection)	Water management
1.25	Conversion and development of forecasting and warning systems (Preparedness)	Water management
1.26	Increase of public awareness and preparedness (Preparedness)	Water management
1.27	Measures after a flood to return to the same or a better position than before the flood	Water management
1.28	Reduction of diffuse pollution of surface water by nutrients from the agricultural and horticultural sector	Water management
1.29	Integrated management of banks	Water management
1.30	Structural repair (based on hydromorphological development potential)	Water management
1.31	Integration / adjustment of recreational pressure in / on the system capacity	Water management
1.32	Countering sedimentation in watercourses	Water management
1.33	Studies and research projects	Water management
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.	Water management
2.1	Study the need to make certain erosion prevention works more enforceable	Environment
2.2	Further develop policy on organic matter	Environment
2.3	Climate adaptation and the associated climate reflex to be included in MER handbooks	Environment
2.4	Awareness-raising of the need for healthy soil, in particular with reduced soil treatment, possibly grant-aided	Environment
2.5	Study of the effect of climate change on the nitrogen cycle and amounts of organic matter	Environment
2.6	Study of the effect of climate change on the various links in material circuits	Environment
3.1	Join together isolated nature areas, increase their size and make them more robust	Biodiversity
3.2	Weave nature into other functions to achieve a basic ecological structure	Biodiversity

3.3	Take into account the climate change in the establishment of natural and other green areas; among others choice of types and origin	Biodiversity
3.4	Adaptation of nature conservation and forestmanagement, with special attention to maintenance and calamities	Biodiversity
3.5	Adjust the management of verges	Biodiversity
3.6	Inclusion of climate adaptation in the development of species protection programmes and plans	Biodiversity
3.7	Study and monitoring of the effect of climate change on specific (Flemish) species	Biodiversity
4.1	Consultation with the insurance sector relating to possible development of new insurance products	Industry & services
4.2	Development of a climate strategy in the New Industrial Policy	Industry & services
4.3	Investigate the benefit of specific adaptation case studies through a few corporate testcases	Industry & services
4.4	Awareness raising of the tourism sector	Industry & services
5.1	Adjust design, specifications and maintenance of roads, including a drainage manual	Transport
5.2	Analyse building and user instructions for civil engineering works and adjust where necessary	Transport
5.3	Consider and adopt ARISCC (in part)	Transport
6.1	Study and awareness-raising on subject of switching to other cultivars or species, or alteration of sowing and harvest dates	Agriculture
6.2	Study and awareness-raising on subject of breed choice and feed composition	Agriculture
6.3	Study and awareness-raising on subject of preventing plant disease and infestations and animal disease	Agriculture
6.4	Create support, facilitate and incentivize the application of blue services in the integral water policy for the area	Agriculture
6.5	Awareness-raising of importance of shade (including small rural elements) for cattle	Agriculture
7.1	Amend regulations to facilitate flexible, sustainable fisheries	Fishery
7.2	Study the effect of climate change on fish populations	Fishery
8.1	Study and possible adjustment of 'Energy Performance Calculation' method	Built environment
8.2	Make adaptation a parameter in the development of sustainable new stable development concepts	Built environment
8.3	Construct and maintain sustainable industrial estates	Built environment
8.4	Adapt the buildings of the Flemish Government	Built environment
8.5	Develop and improve instruments to assess sustainability of various building typologies	Built environment
8.6	Steer and guarantee the adaptation aspect in urban renewal projects	Built environment
8.7	Make adaptation part of (relevant) training courses	Built environment
8.8	Study the effects of Flemish spatial structure on climate policy	Built environment
9.1	Specific awareness raising among target public about the dangers of heat waves	Health
11.1	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	Transversal issues
11.2	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	Transversal issues
11.3	Organize and report on adaptation consultation	Transversal issues
11.4	Periodic compilation of the various sectoral reports to create an adaptation progress report	Transversal issues
11.5	Development of a screening tool to monitor the climate reflex in the Government of Flanders and effectively carry out this examination	Transversal issues
11.6	Extend the CcASPAR network to become a new think tank for a climate-resistant Flanders	Transversal issues

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Colophon

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