Covenant of Mayors
for Climate & Energy

The Covenant of Mayors for Climate and Energy Reporting Guidelines

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Developed by Covenant of Mayors & Mayors Adapt Offices, Joint Research Centre of the European Commission
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CONTENTS

INTRODUCTION

The Covenant of Mayors for Climate and Energy brings together local and regional authorities voluntarily committing to implementing the European Union's climate and energy objectives on their territory. Signatory local authorities share a vision for **making cities decarbonised and resilient, where citizens have access to secure, sustainable and affordable energy**. Signatories pledge to **reduce CO_2 emissions by at least 40% by 2030** and to **increase their resilience to the impacts of climate change**.

The Covenant of Mayors helps local authorities to translate their greenhouse gas (GHG) emissions reduction ambitions into reality, while taking into account the immense diversity on the ground. it provides signatories with a **harmonised data compilation and reporting framework which is unique in Europe** which assists them to follow a systemic climate and energy planning and monitoring at the local level. Developed with the support of the European Commission's Joint Research Centre (JRC), based on the experience of practicing municipalities and regions with the intention to align with most common local methodologies, the Sustainable Energy and Climate Action Plan (SECAP) template constitutes the standard reporting framework for Covenant Signatories. The **SECAP template** forms the skeleton of the individual action plans. The SECAP and its monitoring part allow signatories to **collect and analyse data in a structured and systematic manner**, serve as a basis for good climate and energy management and for tracking progress in implementation.

The Covenant also aims to **give recognition and high visibility** to single climate actions implemented by signatories as well as to **inspire, facilitate exchanges** and **self-assessment**.

Reporting data via the Covenant of Mayors reporting platform allows signatories to **demonstrate the concrete impact of their actions on the ground** (see the 'Covenant in Figures' infographic as well as the 'The Covenant of Mayors in Figures and Performance Indicators: 6-year Assessment' report[1]). The data reported are translated into **understandable and transparent graphical highlights** (see the on-line 'catalogue of action plans'). They give essential **feedback on local actions to national, European and international policy-makers.** This helps to show that the Covenant of Mayors is a consolidated movement of voluntary committed local authorities, driving climate action and local sustainable development.

This guide has been developed by the Covenant of Mayors and Mayors Adapt Offices in collaboration with the European Commission's JRC to assist signatories in understanding the Covenant reporting framework. It seeks to provide signatories with **step-by-step guidelines** throughout the reporting process. Step I is dedicated to guide signatories through the process of filling in the templates, namely Section I for the SECAP template and Section II for the monitoring template. Step II addresses the upload of documents such as the SECAP, while Step III is focused on the integrated checking system developed for the climate mitigation part of the template and official submission. The guide is enriched with some **practical recommendations** and **concrete examples**.

[1] Joint Research Centre 2015, 'The Covenant of Mayors in Figures and Performance Indicators: 6-year Assessment, JRC science and policy reports [available at www.eumayors.eu > Library].

THE COVENANT OF MAYORS PROCESS IN A NUTSHELL

Local authorities joining the Covenant of Mayors for Climate and Energy initiative commit to submit a **Sustainable Energy and Climate Action Plan (SECAP)** within two years following the formal signing, including the mainstreaming of adaptation considerations into relevant policies, strategies and plans. The SECAP is based on a **Baseline Emission Inventory (BEI)** and a **Climate Risk & Vulnerability Assessment(s) (RVAs)** which provide an analysis of the current situation. These elements serve as a basis for defining a comprehensive set of actions that local authorities plan to undertake in order to reach their climate mitigation and adaptation goals. Signatories commit to **report progress every two years** (Figure 1).

Figure 1 – The Covenant of Mayors for Climate and Energy step-by-step process.

The Covenant of Mayors initiative adopts a **holistic approach** to climate change mitigation and adaptation. With respect to climate mitigation, local authorities are guided to address all the different consumers in their territory (see Figure 2). Sectors such as the '**Residential', 'Tertiary', 'Municipal' and 'Transport'** are considered to be the **key mitigation sectors**. Local authorities focus on reducing the energy demand in their territory as well as on matching energy demand with supply by promoting the use of local energy resources.

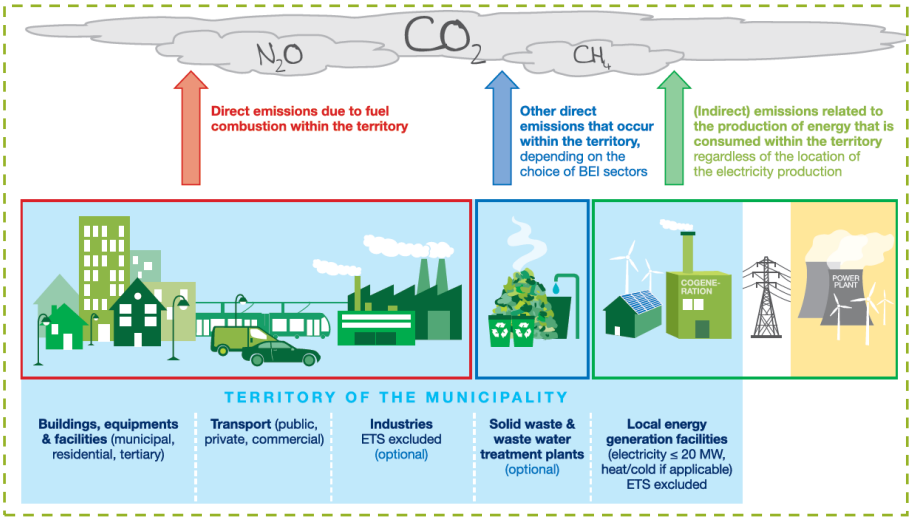


Figure 2 – The Covenant of Mayors territorial approach for energy and climate mitigation.

On the adaptation side, the main vulnerable sectors are considered to be '**Buildings', 'Transport', 'Energy', 'Water', 'Waste'**, '**Land Use Planning'**, '**Environment & Biodiversity'**, '**Agriculture & Forestry', 'Health', Civil Protection & Emergency' 'Tourism'** and '**Other'**.

The methodology endorsed by the Covenant of Mayors relies on an **integrated and inclusive climate and energy planning**, in which local stakeholders have an active role to play.

In order to ensure that the submitted SECAPs are well in line with the Covenant principles (as defined in the Covenant of Mayors Commitment document as well as in the Guidebook[2]), the European Commission's JRC carries out an **analysis** of the submitted action plans. This quality control contributes to guarantee the **credibility and reliability** of the whole Covenant of Mayors initiative. The analysis process focuses on the assessment of a set of **eligibility criteria**. Failure to meet these criteria will prevent SECAP acceptance in the frame of the Covenant initiative. The analysis focuses as well on the consistency of the data provided and a feedback report is issued.

SECAP Eligibility Criteria – the minimum requirements:

- ✓ **The action plan must be approved by the Municipal Council or equivalent body.**
- ✓ **The action plan must clearly specify the Covenant mitigation (i.e. at least 40% CO_2 emission reduction by 2030) and adaptation commitments.**
- ✓ **The action plan must be based on the results of a comprehensive Baseline Emission Inventory (BEI) and Climate Risk & Vulnerability Assessment(s) (RVAs).**
- ✓ **For mitigation, the action plan must cover the key sectors of activity (Municipal, Tertiary, Residential and Transport):**
  - **The Baseline Emission Inventory must cover at least three out of four key sectors.**
  - **The mitigation actions must cover at least two out of four key sectors.**

[2] Available at www.eumayors.eu > Library

GETTING STARTED

Reporting process overview

The SECAP template, currently available offline in Excel format, will be available in the Covenant extranet from 2017 onwards. Figure 3 represents an overview of the reporting process to the Covenant of Mayors. The SECAP template, currently available offline in Excel format, will be available in the Covenant extranet from 2017 onwards.

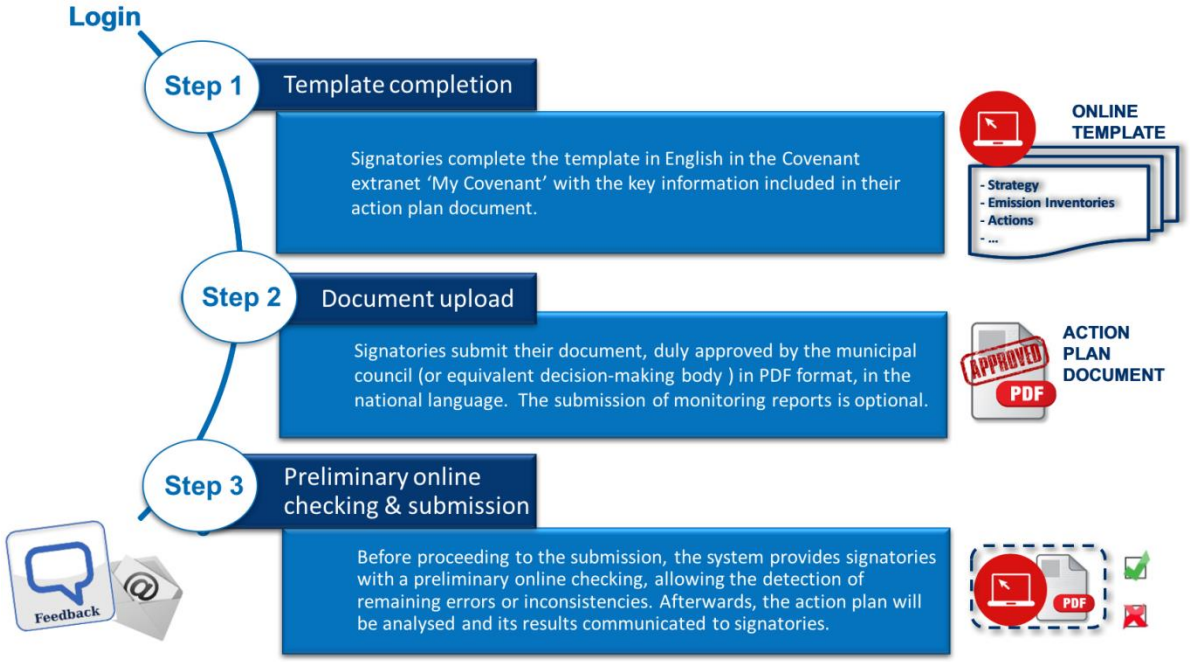


Figure 3 – Snapshot of the reporting process.

Access to 'My Covenant' – the Covenant extranet

The Covenant extranet is the online platform where Covenant Signatories report on the key elements of their action plan and monitoring results using the respective templates. It is built around simple steps that guide you through the completion of the templates and submission process. First, **log in** to the Covenant extranet at www.eumayors.eu/sign-in_en.html with your personal identifiers you should have received at the registration stage.

Getting a user ID and password: In case you have lost (or not received) your password, you can retrieve it under the 'sign-in' webpage. As it is an automatic email, it may end up in the spam box – check it!
Providing access to your Covenant Coordinator: You can link your signatory profile with a Coordinator profile so that they can get an access to your profile. Under 'My account' > 'My local authority', scroll down, click 'add a new organisation' and select your Coordinator in the list.

Template content

The Sustainable Energy and Climate Action Plan (SECAP) template, to be used by signatories of the Covenant of Mayors for Climate and Energy, includes the parts outlined in table 1.

Table 1 – Content of the SECAP and monitoring templates.

	SECAP	Monitoring
Strategy	Dedicated to the vision, the overall CO_2 emissions reduction target(s), the adaptation goals, the attribution of staff and financial capacities and the involvement of stakeholders and citizens.	Dedicated to any changes to the overall strategy, updated figures on the attribution of staff and financial capacities and identification of barriers to the implementation of actions.
Emission Inventories	Dedicated to the amount of final energy consumption and associated CO_2 emissions by energy carrier and by sector in the base year.	Dedicated to the amount of final energy consumption and associated CO_2 emissions by energy carrier and by sector in the monitoring year – the main objective is to monitor the evolution of CO_2 emissions over time.
Mitigation Actions	Dedicated to the list of key mitigation actions to put the overall strategy into action, together with time frames, assigned responsibilities, allocated budgets and estimated impacts.	Dedicated to monitor the implementation status of the key mitigation actions. At least three implemented or ongoing actions have to be submitted as Benchmarks of Excellence.
Scoreboard	Dedicated to understanding the areas of the adaptation cycle in which the signatory has made progress.	Dedicated to monitoring progress against the six steps of the adaptation cycle and creating an overall picture of the signatory's adaptation efforts.
Risks and Vulnerabilities	Dedicated to the climate vulnerabilities, hazards as well as the impacts and assessments thereof.	Dedicated capturing the information that has been gathered to date on the climate vulnerabilities, hazards, in addition to impacts, which are broken down by sector
Adaptation Actions	Dedicated to the Action Plan(s) and individual (key) actions, including various relevant parameters (i.e. sector, timeframe, stakeholders and cost).	Dedicated to tracking the Action Plan(s) and individual actions taken over time to meet goals increase resilience to identified climate impacts.

After completing the template, highlights of the data provided are shown in a **graphical format** for both mitigation and adaptation. When using the on-line templates, you can then decide which graphical representations you would like to display on your public signatory profile on the Covenant of Mayors website.

Frequency of reporting

The SECAP must be submitted **within two years following the adhesion date,** i.e. the date **when the Municipal Council (or equivalent decision-making body) formally decided to join the Covenant of Mayors.**

The **monitoring template** must be submitted **every two years after the action plan submission date**. Having in mind that reporting every two years might put too much pressure on human or financial resources, you can decide to carry out the related emission inventories every four years instead of two. Hence, you would adopt **every two years** the **action reporting approach**, i.e. submit a monitoring template which does not include an emission inventory and focused on reporting on the status of implementation of your actions. However, **every four years** you must carry out a **full reporting**, i.e. submit a monitoring template which includes at least one Monitoring Emission Inventory (MEI). Table 2 presents the **minimum reporting requirements** when submitting a SECAP and the respective monitoring templates.

Table 2 – Minimum reporting requirements according to the timeline.

	Registration stage	SECAP	Monitoring Action Reporting	Monitoring Full Reporting
	Year 0	Within 2 years	Within 4 years	Within 6 years
Strategy	✗	✓	✓	✓
Emission Inventories	✗	✓ *(BEI)*	✗	✓ *(MEI)*
Mitigation Actions	✗	✓	✓ *(min. 3 Benchmarks)*	✓
Adaptation Scoreboard	✓	✓	✓	✓
Risks and Vulnerabilities	✗	✓	✓	✓
Adaptation Actions	✗	✗	✓ *(min. 3 Benchmarks)*	✓

Legend: ✓ Mandatory | ✗ Optional

Figure 4 illustrates the **minimum requirements** concerning the submission of monitoring templates. For instance, in the case of a signatory who has submitted its action plan in 2016; he must carry out an ‘Action reporting’ in 2018 and a ‘Full reporting’ (i.e. with a new Monitoring Emission Inventory) in 2020.

Figure 4 – Minimum requirements concerning the submission of monitoring templates.

Covenant Signatories (or Coordinators on behalf of their associated Signatories) can request an extension where circumstances, outside the local authority's control, delay the submission of the action plan or monitoring results by the official deadline. To do so, they are invited to fill in the online delay request form, available under the Covenant extranet 'My Covenant'. Find out more in the FAQ webpage.

Template formats

The templates are available in two formats:

- **Online**

  The SECAP template will be available in the Covenant extranet ('My Covenant') from 2017 onwards. The official submission to the Covenant of Mayors has to be done using the online template.

- **Excel-based spreadsheet**

  An Excel version of the template is available in the website library[3] for download. The Excel-based template is an offline working version of the official online template. Please note that it is not possible to export the data entered in the Excel to the online platform and vice-versa.

Template legend

Colour codes are used in order to facilitate the completion of the template:

- Optional input cells
- Mandatory input cells
- Output cells (computed by the system when the appropriate input fields have been completed first)
- Pre-filled cells (used in the monitoring template)

Click on underlined terms in the Excel file or slide the mouse over them in the online template to visualise their definition or clarifications regarding each specific field.

The monitoring related fields are highlighted in the Excel file using a blue square.

[3] Available at www.eumayors.eu > Library

Navigation rules

In the online template, you can start the **SECAP** submission process by clicking on **'My action plan'** in the blue menu at the top of the webpage. For the **monitoring template,** click on **'My progress'** in the same menu. First read the information displayed under the 'Get started' page. When clicking on the button to fill in the template, you will be guided through the different parts of the template using the navigation buttons. Note that for the monitoring template you should choose in advance whether you would like to adopt an action reporting (without MEI) or a full reporting approach. In the Excel version of the template, you can use the different navigation buttons at the top and bottom of each tab to navigate from one tab to another or get back to the homepage.

Integrated checking system

The online template will count with an automatic integrated checking system allowing **real-time feedback on errors or missing data** as well as computed figures in both formats of the template. Navigation to other part of the template is only allowed if the results of the checking system are successful. The completion (mandatory vs. optional fields) and the presence of valid data (matching against value ranges, or predefined values) are assessed, formats (text / number / date / link, single / multiple choice fields) are checked, computations are done (output fields) and interlinked data is checked for consistency. If errors are detected at this stage, the system returns the respective notification messages at the top of each page. Note that only after correcting the errors reported, you will be able to submit your template.

Check your template early in the process. The system may reveal errors requiring further action (correction or re-calculation). This will also help you avoid last-minute mistake in the final rush, when the deadline is fast approaching.

Archive feature

Once an action plan is analysed, an archived version of the template is created. These archived versions are visible at any time (in 'read-only' mode) under 'My account' > 'My local authority'.

SECAP resubmission feature

The SECAP resubmission feature is foreseen in two cases:

1) **When your action plan does not successfully pass the full analysis carried out by the European Commission's Joint Research Centre (JRC)** – You will be invited to address the issues raised in the Feedback Report and resubmit your action plan within six months. A new analysis will then be performed.
2) **When your existing action plan has been the subject of significant changes** (such as a considerable change in your overall CO_2 emissions reduction target, a shift of priority in your vision and/or the choice of different sectors to be covered by the emission inventories and action plan) **or you develop a new plan** – In this case, your action plan must be re-approved by your decision-making body. Once politically adopted, your template must be updated and resubmitted.

   If you are an existing signatory of the Covenant of Mayors 2020 commitments and have signed up to the Covenant of Mayors 2030 commitments, you should first assess the implementation of your 2020 commitments via the submission of a monitoring template before submitting a new action plan for 2030.

If you wish to use the resubmission feature, please contact the Covenant of Mayors Office (info@eumayors.eu).

Further guidance

Title	Description
How to develop a Sustainable Energy Action Plan Guidebook	Provides guidance on the preparation process of Sustainable Energy Action Plans focused on mitigation, particularly on the calculation of emission inventories.
Urban Adaptation Support Tool	Provides step-by-step guidance on the preparation of climate change adaptation strategies and plans.
Quick reference guides	Offer practical guidance and examples on topics such as monitoring an action plan, the joint approach to develop an action plan and the financing opportunities available for the implementation of action plans.
E-learning platform	Provides practical guidance, recommendations, examples and virtual demonstrations related to the preparation, implementation, monitoring and financing of action plans, including both mitigation and adaptation.

If you have any questions, or would like assistance when completing the template, please contact the helpdesk:

- For issues related to the completion of the SECAPtemplate, questions on the Covenant methodological requirements or the use of 'My Covenant' (extranet):
  Covenant of Mayors Office – info@eumayors.eu
- For more specific technical questions on the methodological requirements or issues related to the use of the preliminary online checking application and feedback reports:
  Joint Research Centre – JRC-COM-TECHNICAL-HELPDESK@ec.europa.eu

STEP I – FILL IN THE TEMPLATE

SECTION I – SECAP TEMPLATE

STRATEGY

This first part provides an overview of your overall strategy. If you have carried out a Sustainable Energy Action Plan (SEAP) for 2020, please refer to the 'Reporting Guidelines on Sustainable Energy Action Plan and Monitoring'[4]. If you have carried out a SECAP for 2030, this part addresses both your mitigation and adaptation strategies.

1) Vision

Please define here the **long-term** vision that will shape the climate and sustainable energy future of your municipality. This should include information regarding key milestones, priority sectors, desired (social/environmental/economic) outcomes and potential benefits or opportunities.

Our long-term goal is to make The Hague a climate-neutral and climate-proof city by the year 2040.

The Hague Municipal Government, The Netherlands, 2011, 'Climate Plan The Hague'.

2) Commitments

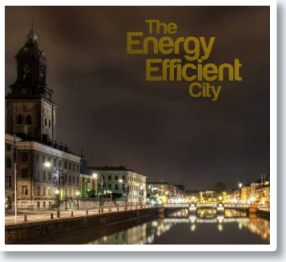
The first fields refer to your overall mitigation target(s), which is expressed in **percentage of CO_2 emissions reduction.** Your target should be **a minimum 40% reduction by 2030.** If you have adopted as well the Covenant commitments for 2020, then you can include your 2020 target which shall correspond to a minimum 20% reduction. You must indicate the base year against which the target(s) is set. If your action plan includes more than one target, it is highly recommended to keep the same base year.

Mitigation					
CO_2 Target	Unit	Target Year	Base Year	Reduction Type	Population estimates in target year
25%	%	2020	2005	absolute	100000
40%	%	2030	2005	absolute	110000
90%	%	2050	2005	absolute	135000

[4] Available at www.eumayors.eu > Library

The target can be set as an **absolute reduction** (percentage of quantity of CO_2 emissions in the baseline year) or as a **per capita reduction**. In the latter, the emissions of the baseline year are divided by the number of inhabitants in the same year, and the percentage emission reduction target is calculated on that basis. The per capita approach is generally opted to facilitate progress tracking when population is foreseen to change significantly. Select the option corresponding to your choice. Should you opt for the per capita reduction target, indicate the **population projections by the respective time horizon(s)**.

In case you have a **longer-term target**, i.e. beyond 2030, you can as well specify your reduction target, including the base year and the time horizon to which the target refers. Please note that the commitment taken within the Covenant framework is linked to EU targets in 2030 (and 2020), therefore the CO_2 reduction target has to be defined for those years. If you have only defined a longer-term target in your action plan, you are required to extrapolate your 2030 (and 2020) target and include it as part of your action plan.



We have adopted a local environmental objective to reduce our carbon footprint. The aim is that by 2050 the city will have a sustainable and fair level of carbon dioxide (CO_2) emissions. The average level of CO_2 equivalent emission per person in Gothenburg will have to be reduced from the current level of about 10 tonnes per person to less than 2 tonnes per person for the goal to be reached. We have also adopted an interim target which states that by 2020 emission levels of CO_2 will be reduced by at least 30 % compared to the levels in 1990.

City of Gothenburg, Sweden, 'The Energy Efficiency City'.

In the second field which refers to your **adaptation goal(s)**, please outline your municipality's adaptation goals (if any), including the target and base year if applicable, either in descriptive or in quantitative terms. Feel free to add as many rows as necessary and be as specific as possible.

Adaptation			
Goal	**Unit (% or other)**	**Target year**	**Base year**
reduction of losses in water supply network	10%	2025	2005
reduce percentage of sealed ground surfaces in city	15%	2025	2005

Add as many rows as necessary.

3) Coordination and organisational structures created/assigned

In this field you are invited to provide a short description of the specific **administrative structures** your local authority has created or assigned to implement your action plan in the framework of the Covenant of Mayors initiative.

Bratislava has created a new adaptation working group led by the department of the Chief Architect and staffed with, for example, representatives from the departments of Strategic Project Management and Financial Resources, the Environment, Social Affairs, Transport, and Infrastructure. The working group also encompasses the representatives of scientific organisations (i.e. Comenius University in Bratislava), the Bratislava Water Company as well as non-governmental organisations.

City of Bratislava, Slovakia

4) Staff capacity allocated

Specify here which institutions allocate staff to the **preparation of your action plan.** There are optional fields referring to the number of **full-time equivalent (FTE) jobs**. If you know this information, please provide it as it can be helpful for other municipalities willing to join the Covenant and get started with the energy and climate planning process.

Type	Plan Preparation		Plan Implementation
		Full-time equivalent job(s)	
Local authority	x	1	x
Covenant Coordinator	x	0,5	x
Covenant Supporter	x	0,5	x
External consultant			
Other			x
Total		2	

Note that full-time equivalent (FTE) jobs are defined as total hours worked divided by average annual hours worked in full-time jobs. A FTE of 1.0 means that the person is equivalent to a full-time worker, while a FTE of 0.5 signals that the worker is only half-time.

Furthermore, you can as well specify the foreseen staff during the **implementation of your action plan**. This shall be updated at the monitoring stage.

5) Involvement of stakeholders and citizens

Please specify here how stakeholders and citizens were engaged in the preparation of your action plan (i.e. which participation methods – public consultation, working groups, forum, workshops, meeting with other municipalities – were used, how many people were involved) and how you plan to involve them in the ensuing implementation.

Type		Stakeholders involved	Level of involvement
Local athority's staff	x	Department of Environment, Social, Energy, Civil Protection, Urban Planning	High
External stakeholders at local level	x	Environmental NGO, school teachers, Residents, local energy utility, building constructors, transportation companies	High
Stakeholders at other levels of governance	x	Region, national energy utility, university, ESCOs	Medium

In the action plan's development phase inhabitants and local stakeholders were involved in data collection for the Baseline Emission Inventory and in consulting the plan. Moreover, current information on the action plan was regularly published on the official city website.

Kościerzyna Municipality, Poland, 2012, 'Sustainable Energy Action Plan'.

6) Overall budget for implementation and financing sources

This section is dedicated to the budget foreseen for the whole implementation of the actions outlined in your action plan. It is split in budget foreseen for carrying out mitigation and adaptation actions. You should start first by selecting if your budget comes only from the **local authority's own resources** and/or from **other actors**. Afterwards, you should specify the amount of money in **euros** split into **investment** and **non-investment costs** as well as the **time period** to which the budget indicated refers. Although the **investment from the local authority for mitigation** is the only required field to complete, if you have estimated other costs, you are welcome to report separately for adaptation. You can either report the total budget foreseen from other actors or specify this budget into the different sources, i.e. National funds & programmes, EU funds & programmes and Private. In fact, all this information will be extremely relevant at the EU and national levels to understand the amount of investments mobilised at the local level for energy and climate action.

Source	Budget foreseen for plan implementation (€)					
	Mitigation			Adaptation		
		Investment (€)	Non-investment (€)		Investment (€)	Non-investment (€)
Local Authority's own resources	x	50000	10000	x	60000	
Other actors:	x	300000		x		
- National Funds & Programmes	x			x	500000	
- EU Funds & Programmes	x			x		
- Private	x			x		
	ⓘ Select x for the ones applicable.					
Time period	2005	2020		16 years		

Note that investment refers specifically to the capital to be invested, while non-investment costs integrate all operational and running costs, e.g. maintenance and staff costs, as well as other non-investment expenditures such as the organisation of an awareness raising campaign.

The total implementation cost incorporates investment and non-investment costs and it refers to the investment costs or amount originally invested to implement the actions outlined in your action plan.

The overall investment foreseen, to be carried out until 2020, to implement the Sustainable Energy Action Plan of Funchal is 238.77 million euros. Of this investment, 10.4% is carried out by the Funchal Municipality, 20.1% by the citizens and 69.4% by private and public companies and organisations.

Funchal Municipality,Portugal, 2012, 'Sustainable Energy Action Plan'.

7) Monitoring process

Describe here how you are planning to monitor the implementation of your action plan (e.g. number of revisions foreseen, corresponding timeframe, etc.).

The Steering Committee and the 'Covenant of Mayors' working group will be responsible for monitoring, follow-up and evaluation of the implementation progress of the measures. The two structures will meet on a regular basis (once every three months) and check the progress made so far. Should any delays arise in progress, corrective measures will be adopted in order to get back into track with the foreseen actions and expected results.

Hersonisos Municipality, Greece, 2012, 'Sustainable Energy Action Plan'.

Current approaches to monitoring implementation are co-ordinated through the Policy and Communications Business Partner. However, in moving to a more formal risk and vulnerability process, a new monitoring approach will be developed. This will consist of ad-hoc updates to the climate risk and vulnerability assessment, along with a more structured review every 2 years. Once developed, implementation of the climate adaptation strategy will be monitored on a more regular basis.

Newcastle upon Tyne, United Kingdom

8) Assessment of the adaptation options

In this section, you are asked to describe how your city assesses its adaptation options, meaning the practice of identifying and prioritising options to adapt to climate change and evaluating them in terms of criteria such as availability, benefits, costs, effectiveness, efficiency, and feasibility. Please describe the method(s) (e.g. cost-benefit analysis (CBA), multi-criteria analysis (MCA), stakeholder decision, experiment & observe) and the main outcomes.

9) Strategy in case of extreme climate events

This section focuses on your local authority's strategy to deal with extreme weather events in particular. Make reference to any extreme weather event in the past that is attributable to climate change. Specify the arrangements in place for risk management, post-disaster recovery and reconstruction. Describe how you capture lessons learned after an extreme weather event has taken place, or whether there is a process of embedding lessons learned into your planning or longer term adaptation strategy in order to reduce the impacts of such extreme weather-related damages in the future. Extreme weather events can be understood as those that create extensive disruptions or disasters in the immediate term as well as residual long-term damage. These can include, but are not limited to, floods, heat waves, droughts, wildfires, cloudbursts, storms, and other extreme weather extremes.

After extreme weather and flooding in the summer of 2002, the city of Münster released a flood action plan with the objectives of improving the exchange of information, raising awareness, reducing the risk of damage, and mitigating flood levels. The action plan resulted in the establishment of a space of 30 to 50 meters along the edge of bodies of water to be kept free of development.

City of Münster, Germany

EMISSION INVENTORIES

In this part, you will start first by completing your **Baseline Emission Inventory (BEI)**. In case you already have other emission inventories at the time of submitting your SECAP, you may add a **Monitoring Emission Inventory (MEI)** after filling in your BEI. In the emission inventories part, you will report data concerning your final energy consumption, local energy production (if applicable), and the emission factors used to calculate your CO_2 emissions.

1) Inventory year

The first inventory year refers to the baseline year, i.e. the year against which the achievements of the emission reductions in your target year are measured. In the online template, the baseline year is pre-filled since it is specified under your overall CO_2 emissions reduction target in the Strategy part. In case you add a MEI, you should indicate here to which year it refers to.

2) Number of inhabitants in the inventory year

Please specify here the number of inhabitants in the inventory year.

3) Emission factors

Emission factors are coefficients which quantify the emissions per unit of activity. CO_2 emissions are calculated for each energy carrier by multiplying final energy consumption by the corresponding emission factor. Two approaches can be adopted:

- **IPCC**[5] – emission factors for fuel combustion – based on the carbon content of each fuel;
- **LCA (Life Cycle Assessment)** – emission factors for the overall life cycle of each energy carrier, i.e. including not only the GHG emissions due to fuel combustion but also emissions of the entire energy supply chain – exploitation, transport and processing.

Tick the box corresponding to your choice of emission factors.

4) Emission reporting unit

Tick the box corresponding to the emission reporting unit adopted:

- **tonnes CO_2** – if you choose to report only CO_2 emissions;
- **tonnes CO_2 equivalent** – if you choose to include also other GHGs such as CH_4 and N_2O, e.g. from non-energy related sectors such as waste and wastewater management.

5) Methodological notes

State here any methodological notes you consider relevant for the understanding of your emission inventory. You can specify as well the data sources used to collect final energy consumption, energy production or other relevant data (e.g. national statistics bodies, energy suppliers and grid operators, surveys, etc.). This information can be useful for other signatories, mainly for those of your country.

[5] Intergovernmental Panel on Climate Change.

6) Results of your Emission Inventory

This section is divided into three main parts:

- **A) Final energy consumption** – in which you should report final energy consumption data by sector and by energy carrier;
- **B) Energy supply** – in which you should report data related to municipal green electricity purchases and local energy production, if applicable;
- **C) CO_2 emissions** – in which you should report the emission factors applied – making possible the automatic computation of CO_2 emissions.

A) FINAL ENERGY CONSUMPTION

In the online template, **select the sectors** that are included in your emission inventory and for which you would like to report data by ticking the respective boxes. A table based on your selection will appear. In the Excel version of the template, the full table is presented.

In the context of the Covenant of Mayors initiative, **four Covenant key sectors** have been defined. They are considered the main sectors where local authorities can influence energy consumption and consequently reduce related CO_2 emissions.

The Covenant key sectors are indicated with a 'key' icon: in the template and are the following:

- **Municipal buildings, equipment/ facilities**
- **Tertiary (non municipal) buildings, equipment/facilities**
- **Residential buildings**
- **Transport**

Based on your selection, the **final energy consumption table** will appear for completion. In the Excel version of the template, the full table is presented and you may choose to hide the rows which are not applicable to your situation.

The first column of the table refers to **sectors**, while the following columns refer to the **energy carriers** (e.g. electricity, heat/cold, natural gas, etc.) used in the respective sectors within the territory

of your local authority. Final energy consumption is reported in **MWh** for each energy carrier and each sector for the given year.

Sector		FINAL ENERGY CONSUMPTION [MWh]															
				Fossil fuels								Renewable energies					
		Electricity	Heat/cold	Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	Total
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES																	
Municipal buildings, equipment/facilities																	0
Tertiary (non municipal) buildings, equipment/facilities																	0
Residential buildings																	0
Public lighting																	0
Industry	Non-ETS																0
	ETS (not recommended)																0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRANSPORT																	
Municipal fleet																	0
Public transport																	0
Private and commercial transport																	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER																	
Agriculture, Forestry, Fisheries																	0
TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- **Sectors**

Table 3 provides a description of the sectors that can be included in the emission inventory under the **'Buildings, equipment/facilities and Industries' macro-sector**.

Table 3 – Sectors included in the emission inventory under 'Buildings, equipment/facilities and Industries'.

Sector		Description
Municipal buildings, equipment/facilities		Buildings and facilities owned by the local authority. Facilities refer to energy consuming entities that are not buildings, such as wastewater treatment plants.
Tertiary (non municipal) buildings, equipment/facilities		Buildings and facilities of the tertiary sector (services), for example offices of private companies, banks, commercial and retail activities, hospitals, etc.
Residential buildings		Buildings that are primarily used as residential buildings. Social housing is included in this sector.
Public lighting		Public lighting owned or operated by the local authority (e.g. street lighting and traffic lights). Non-municipal public lighting is included in the sector of "Tertiary buildings, equipment/facilities".
Industries	**Non-ETS**	Refers to manufacturing and construction industries not covered in the EU Emissions Trading Scheme (EU-ETS).
	ETS	Refers to manufacturing and construction industries covered in the EU-ETS. Integrating them in your emission inventories is not recommended, unless such plants were included in previous energy plans and CO_2 emission inventories of the local authority.
Others		Buildings, facilities and machinery of the primary sector (agriculture, forestry and fisheries), for example greenhouses, livestock facilities, irrigation systems, farm machinery and fishing boats.

The **'Transport' sector** is divided into three subsectors as presented in table 4.

Table 4 – Subsectors included in the emission inventory under "Transport".

Sub-sector	Description
Municipal fleet	Vehicles owned and used by the local authority's administration.
Public transport	Bus, tramway, metro, urban rail transportation and local ferries used for passenger transport.
Private and commercial transport	Road, rail and boat transport in the territory of the local authority which refer to the transport of persons and goods not specified above (e.g. private passenger cars and freight transport).

The template presents the opportunity to report at different sectoral levels in order to accommodate a certain degree of **flexibility** for signatories. This was essentially based on the fact that the data availability and emission inventories' practices differ across local authorities, regions and countries.

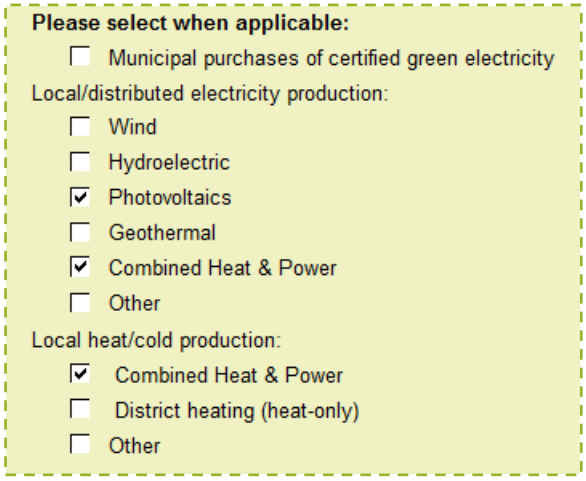
For instance, if you do not have energy consumption data available at the individual sectors' level (residential, tertiary, etc.) in the 'Buildings, equipment/facilities and Industries' macro-sector, you can report aggregated data at the level of the macro-sector. For this purpose, in the online template you can click on the **'edit subtotals'** and provide the energy consumption data by energy carrier concerning 'Buildings, equipment/facilities and Industries'. The same applies if you do not have transport data disaggregated by municipal fleet, public transport, private and commercial transport, you can report only the total data of the 'Transport' sector. In order to show which sectors are included in your inventory in the online template, please also tick the boxes corresponding to the individual sectors covered by your subtotal at the macro-sector level even if you cannot provide detailed data.

You are highly recommended to provide in table A the most complete set of energy consumption data which is available to you. Only complete templates will allow the compilation of relevant statistics on the performance of Covenant Signatories to be communicated at national, European and international levels.

The Covenant key sectors should be covered in the emission inventory. When additional sectors are added, related actions in the said sectors should be planned in the action plan. The data should cover the four key sectors plus other sectors in which you intend to take action, so that the result of those actions can be reflected in the monitoring emission inventories.

B) ENERGY SUPPLY

In the online template, please **select the options** describing the diversity of your **energy supply** by ticking the respective boxes. In the Excel version of the template, the full tables are presented and you may choose to hide the tables which are not applicable to your situation. If your local authority does not purchase green electricity or if you do not have any local energy production plants, you can go directly to part C. CO_2 emissions.



According to the box ticked, you will be asked to complete further data. Table 5 lists the energy supply options as well as the corresponding tables to be completed in the template.

Table 5 – Energy supply options and corresponding tables to be completed in the template.

Energy supply options		Table
Municipal purchases of certified green electricity		B1
Local/distributed electricity production	Wind	B2
	Hydroelectric	
	Photovoltaics	
	Geothermal	
	Combined Heat & Power	B3
	Other	
Local heat/cold production	Combined Heat & Power	B4
	District heating (heat-only)	
	Other	

B1. Municipal purchases of certified green electricity

If the local authority is purchasing certified green electricity please provide the **amount of electricity purchased (in MWh)**. Certified green electricity means electricity produced from renewable energy sources covered by guarantees of origins as per article 15 of directive 2009/28/EC.

B1. Municipal purchases of certified green electricity

Municipal purchases of certified green electricity	Renewable electricity purchased [MWh]	CO_2 / CO_2 eq. Emission factor [t/MWh]
Certified green electricity purchased		

If you are using **IPCC** emission factors, then by default the certified green electricity emission factor is **zero**. If you are using **LCA** emission factors, you should **indicate the CO_2 emission factor** for the electricity purchased.

Note that only the green electricity purchased by the local authority should be included. Green electricity purchased by other actors should not be accounted here.

B2. Local/distributed electricity production (renewable energy-only)

In the case of electricity generated exclusively from **renewable energy sources**, you should specify the respective **amount of locally generated electricity (in MWh)**. You may choose to report the amount by each plant type or to report only the total, in case detailed information is not available.

B2. Local/distributed electricity production (renewable energy-only)

Local renewable electricity plants (ETS and large-scale plants > 20 MWe not recommended)	Renewable electricity produced [MWh]	Emission factor [t/MWh produced]	CO_2 / CO_2 eq. emissions [t]
Wind			
Hydroelectric			
Photovoltaics			
Geothermal			
TOTAL			

If you are using **IPCC** emission factors, then by default the renewable electricity emission factor is **zero**. If you are using **LCA** emission factors, you should **indicate the CO_2 emission factor** for the renewable electricity generated.

In order to decide whether or not to include renewable energy power plants in the inventory, you are advised to refer to the decision tree from the Guidebook (Part II, sub-chapter on Emission Factors).

B3. Local/distributed electricity production

In the case of Combined Heat & Power (CHP) plants, which generate heat and electricity simultaneously, or any other plants not listed, you should report here the **amount of electricity produced (in MWh)**, both **from renewable energy and non-renewable energy sources**. As some CHP plants are dual-fuel (or use a back-up fuel) it becomes relevant to distinguish the electricity production that comes from renewables and non-renewable sources. You should also report the **amounts of energy sources used to generate electricity (in MWh)** as well as the **amount of CO_2 emissions (in tonnes)** related to the electricity production (both from renewable energy and non-renewable energy sources).

B3. Local/distributed electricity production

Local electricity production plants (ETS and large-scale plants > 20 MW not recommended)	Electricity produced [MWh]		Energy carrier input [MWh]										CO_2 / CO_2 eq. emissions [t]	
			Fossil fuels					Waste	Plant oil	Other biomass	Other renewable	Other		
	from renewable sources	from non-renewable sources	Natural gas	Liquid gas	Heating oil	Lignite	Coal						Fossil sources	Renewable sources
Combined Heat and Power														
Other														
TOTAL														

In the case of CHP plants, you only report here the electricity produced, while the heat/cold produced is reported in the next table (B4). You will need to report separate figures for the amounts of energy sources used for the production of electricity (in table B3) and for the production of heat (in table B4). It is recommended to use the equation reported in the Guidebook (Part II, sub-chapter on Emission Factors) to allocate the fuel use between electricity and heat/cold production.

In order to decide whether or not to include electricity production from CHP plants in the inventory, you are advised to refer to the decision tree from the Guidebook (Part II, sub-chapter on Emission Factors).

B4. Local heat/cold production

If heat/cold is supplied as a commodity to end-users within the territory of the local authority, please indicate the **amount of heat/cold produced (in MWh)**, both **from renewable energy and non-renewable energy sources**. You should also report the **amount of energy sources used to generate heat/cold** as well as the **amount of CO_2 emissions (in tonnes)** related to the heat/cold production (both from renewable energy and non-renewable energy sources).

B4. Local heat/cold production

Local heat/cold production plants	Heat/cold produced [MWh]		Energy carrier input [MWh]										CO_2 / CO_2 eq. emissions [t]	
			Fossil fuels					Waste	Plant oil	Other biomass	Other renewable	Other		
	from renewable sources	from non-renewable sources	Natural gas	Liquid gas	Heating oil	Lignite	Coal						Fossil sources	Renewable sources
Combined Heat and Power														
District heating (heat-only)														
Other														
TOTAL														

Note that in principle, the total amount of heat/cold produced should be very close to the amount of heat/cold consumed and reported in table A.

C) CO_2 EMISSIONS

C1. Emission factors

Please **indicate the emission factors** that you have used for your CO_2 emissions calculation. You can visualise **default fuel emission factors** above your input fields in table C1. The emission factors are displayed based on the emission factor approach and reporting unit previously selected. If you have used these default values, you can simply select them.

A list of default emission factors, including for electricity, is provided in annex I. These emission factors can be replaced by country specific emission factors or you can develop your own emission factors based on the detailed properties of the fuels used within your territory.

In what regards the **electricity emission factor**, you should report your **national** electricity emission factor (NEEFE), and if applicable your local electricity emission factor (EFE). The latter only applies if there are local energy production plants in the territory of your local authority. Table 6Table 6 provides an overview of both national and local electricity emission factors.

Table 6 – Distinction between National and Local electricity emission factors.

Emission Factor	Definition	When to apply?
National (NEEFE)	Emission factor for not locally produced electricity. It refers to the energy mix used to produce electricity into the national or regional grid**.**	If there is no local electricity production and no municipal green electricity purchases.
Local (EFE)	Emission factor adjusted for locally produced electricity and/or green electricity purchases.	If you have local electricity production plants in the territory of your local authority and/or municipal purchases of certified green electricity.

The **local electricity emission factor** is calculated by applying the formula described in the Guidebook (Part II, sub-chapter on Emission Factors).

Likewise, the **heat/cold emission factor** (EFH) should reflect the energy mix used to produce the heat/cold that is referred in table A. It is calculated by applying the formula described in the Guidebook (Part II, sub-chapter on Emission Factors).

C2. Inclusion of non-energy related sectors

You may voluntarily include non-energy related emission sources in the inventory, if your action plan includes actions to mitigate these emissions. For instance, you can choose to include CH_4 emissions from landfills, if one of your actions is to implement landfill gas recovery.

Please tick the box only if you would like to report emissions from the sectors listed in table 8.

Table 7 – Sectors not related to energy consumption.

Sector	Description
Waste management	Refers to emissions not related to energy consumption, such as CH_4 from landfills.
Wastewater management	Refers to emissions not related to energy consumption, such as CH_4 and N_2O from wastewater treatment plants.
Other non-energy related	Refers to any other non-energy related sector. Negative numbers are allowed in this cell, in case you need to report emissions reduction achieved through e.g. green infrastructures (not recommended for achieving the minimum 20% reduction target and only if you have a specific methodology and data to measure all carbon stock change on the territory).

Note that when including non-energy related sectors such as waste and wastewater management, the emissions must be reported in CO_2 equivalent.

C3. Emission Inventory

In the online template, after completing all the data specified above, you can click on the 'Generate emission table' button. The **emission inventory output table** is automatically calculated as **the product of final energy consumption** reported in table A **and the corresponding emission factor** reported in table C1. The formulas are as well incorporated in the Excel version of the template. If any data-related issue is identified by the integrated checking system, you will receive the corresponding notification at this stage in the online template.

Note that if one of the energy carriers stated in table A refers to two or more energy carriers depending on the sector (e.g. several fossil fuels under the column 'other fossil fuels'), it is recommended to calculate a weighted emission factor for that energy carrier. Therefore, you should make separate calculations with the different energy carriers and their respective emission factors, and report the corresponding average emission factor in table C1.

Example for weighted emission factor: If natural gas consumption occurs in two sectors: 'Municipal buildings, equipment/facilities' and 'Transport', the respective emission factors are different. The first corresponds to stationary combustion and the second to mobile combustion. In this example, the natural gas emission factor to be reported in table C1 can be calculated by dividing total emissions (26,502 tCO_2 eq.) by total final energy consumption (130,000 MWh), resulting in 0.204 tCO_2eq/MWh.

Sector	Final energy consumption (MWh)	Emission Factor (tCO_2eq/MWh)	Emissions (tCO_2eq)
Municipal buildings	100,000	0.202	20,200
Transport	30,000	0.210	6,302
Total	130,000	-	26,502

MITIGATION ACTIONS

1) Title

Please specify the title of your action plan.

2) Date of formal approval

Please indicate the date of formal approval by the Municipal Council (or equivalent decision-making body for other sub-national levels). Please note that **your plan should only be submitted after being approved by the Municipal Council**. You will not be allowed to enter an approval date in the future in this field.

3) Decision body approving the plan

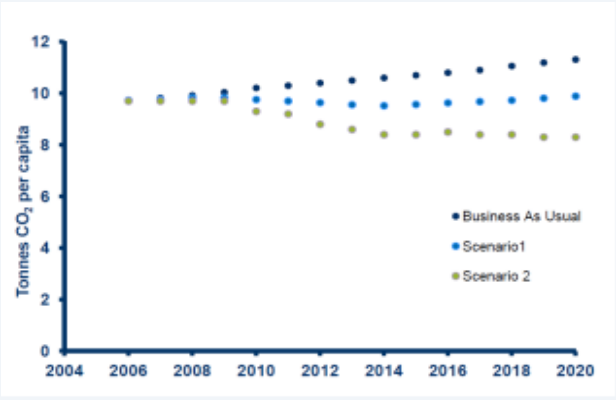
Please provide the name of the decision body approving the plan.

4) Webpage

Please insert the link through which more information about your action plan can be found.

5) Business-as-usual projections (if applicable)

A Business-as-usual (BAU) or reference scenario is defined as a projection of energy demand and CO_2 emissions under the hypothesis of continuing current trends in population, economy, technology and absence of changes in current energy and climate policies. It is commonly called the "do nothing" scenario. In case you have used this approach for the development of your action plan, you can report here your **projections** in terms of **final energy consumption** (in MWh) and **CO_2 emissions** (in tonnes) by the time horizon(s) corresponding to your target(s), i.e. by 2020, 2030 and/or other.



Dublin has adopted a **scenario-based approach**. Three scenarios were developed: **Business-as-usual**; **Scenario 1** which proposes a set of actions that can be easily implemented both in terms of cost and complexity; and **Scenario 2** which includes all measures considered in scenario 1 plus more expensive actions that can deliver greater CO_2 reductions.

Dublin City Council & Codema, 2010, 'Dublin City Sustainable Energy Action Plan 2010-2020'

6) Methodological notes

Please describe here any methodological notes you consider relevant for the understanding of your action plan.

7) Estimates of the impacts of actions in your plan's time horizon(s)

If you have only inserted the **Baseline Emission Inventory**, you will be providing the estimates of the impacts of your actions in relation to the base year. This is called **option 1** and is selected by default. However, if you have set a more distant baseline year and calculated also one or more **Monitoring Emission Inventories** (MEIs) you may wish to report the estimates of the impacts of your actions in relation to the data reported in MEIs. This is called **option 2**. You can select from the drop-down menu to which emission inventory the estimates refer. When using option 2, the actions reported are those needed to cover the gap between emissions during one of the recent monitoring years and 2020, **while the target is as well calculated on the basis of BEI**.

Note that for signatories from EU countries, the CO_2 reduction target is set against the baseline year emissions (BEI) and not in relation to a Business-as-usual scenario.

The following examples might help you better understand in which cases the choice of **option 2** might be more relevant.

Example 1: The emissions have considerably decreased between the BEI and a recent MEI.

According to option 2, you report only the actions needed to cover the gap between the MEI year and the 2020 target. Please note that if a very significant reduction has already been achieved between the BEI and the MEI year, prior to the plan's implementation, you are recommended to set a more ambitious target to 2020 than the minimum 20%.

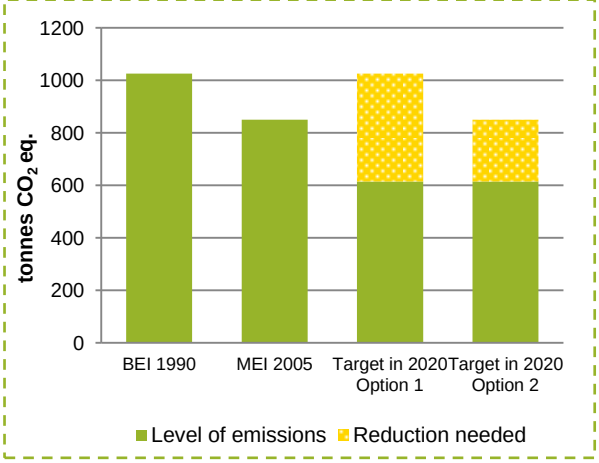


Figure 5 - CO_2 reduction needed according to Option 1 and to Option 2 - Example 1.

Example 2: The emissions have considerably increased between the BEI and a recent MEI.

In this case, if you do not take into account the evolution between the BEI and the MEI year, you might face the risk of underestimating the reduction needed to meet your target to 2020. It is therefore recommended to report the CO_2 reduction needed to cover the gap between the MEI year and 2020. The graph below might help you better visualise the difference in the estimates according to the different options.

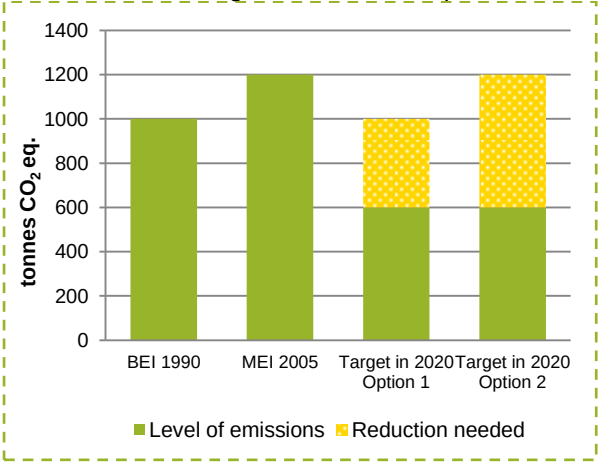


Figure 6 - CO_2 reduction needed according to Option 1 and to Option 2 - Example 2.

If instead you have estimated the impacts of your actions against a **Business-as-usual scenario**, you will be able to select **option 3**.

If your action plan includes more than one target, it is highly recommended to keep the same approach to estimate the impacts of your actions in the different time horizons.

Note that if you set a per capita reduction target, the CO_2 reduction needed should be reported in absolute values and calculated multiplying the per capita reduction by the estimated population in the target year.

8) Key actions

This table aims at summarising information concerning the mitigation actions planned in your action plan, both short and long term. In case your plan contains a large number of actions, you can report only the ones you define as key actions. However, the totals per sector should include all the actions foreseen in your action plan. For convenience, similar actions can be grouped under one single action (e.g. installation of PV on the roof of 10 municipal buildings, for 80 kW of total installed capacity).

Depending on your Covenant commitments, i.e. 2020, 2030 and/or other, you will be requested to provide the estimated impacts of your actions by the time horizon(s) defined in your plan.

As a first step, you must fill in the table with **sectoral level data**. This means that for **each sector** for which actions are defined in your plan you should report the overall **estimated implementation cost** (in Euros); estimated **energy savings** (in MWh/a), **renewable energy produced** (in MWh/a) and **CO_2 emissions reduction** (in tonnes/a) in **your plan's time horizon(s)**, the latter three being mandatory figures. The total per sector corresponds to the sum of the expected savings of all the actions foreseen in your action plan for the said sector. It does not necessarily need to match the sum of the actions reported in the table as you may choose to report only the most significant ones. However, you are highly recommended to insert estimates for as many key actions as possible. A 'control' cell named 'Estimated reductions not associated with any of the reported actions' included in the table will show you the difference between the total estimates provided by sector and the sum of the estimates of the key actions reported.

Note that the action plan should contain actions targeting the Covenant key sectors: Municipal buildings and equipment/facilities, Tertiary buildings and equipment/facilities; Residential buildings; and Transport.

The next step consists of **adding your key actions**. To do so in the online template, click under the respective sector on the icon 'Add action': . If you wish to delete an action, please use the 'Delete action' icon: and to edit an action, the respective 'Edit action' icon:

Each time you click 'add action' in the online template you will navigate to a specific **action form**. Table 8 outlines the information that you should provide for each action. After completing the form you will be redirected to the table, in which your action will appear listed.

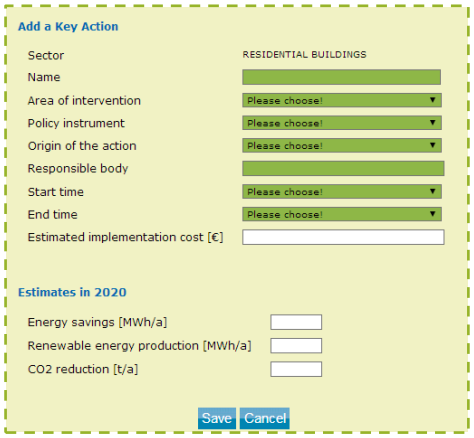


Table 8 – Required fields for reporting mitigation actions.

Field	Description
Name *	You should provide the title of your action.
Area of intervention *	You should select from the drop-down menu which specific area of intervention is targeted by your action. For instance, if you have an action on 'Thermal insulation of residential buildings' you would select that the area of intervention is the 'Building envelope'. **
Policy instrument *	You should select from the drop-down menu which policy instrument is used to implement your action. For instance, if your action is 'Thermal insulation of residential buildings' you might decide to implement a new building regulation for new houses and in this way your policy instrument would be 'Building standards'. In case you have actions for which there is no policy instrument to be applied you can choose 'not applicable'.
Origin of the action *	You should select from the drop-down menu the authority level which has initiated the action. This field intends to appraise how your action is dependent on other levels of policy decision. For instance, if there is a national legislation on implementing solar thermal panels in new buildings and you have incorporated this action in your action plan, you should select 'Other (national, regional …)'. If you plan to replace buses for more efficient/low carbon fuel buses and this is a decision made by the Municipal Council, you should choose 'Local authority'.
Responsible body *	Please state the name of the body responsible for implementing each action. Within your action plan, responsibilities should be assigned to the different departments of your local authority. These might be also third Parties, such as energy utilities, Energy Services Companies (ESCos), local energy agencies or provinces/regions.
Implementation timeframe *	Please indicate the start and end year of each action in order to differentiate the short-, mid- and long-term actions.
Estimated implementation cost	Please provide an indication of the estimated implementation cost for each action (in Euros). The implementation cost refers to the capital required or amount originally invested to implement the action plus the associated operational and running costs involved in the implementation timeframe of such an action. Therefore the implementation cost includes both: investment and

Field		Description
		non-investment costs. This information will provide some indications on which are the most cost-effective actions.
Estimates in the plan's time horizon(s)	**Energy savings**	Please enter the estimates on energy savings (in MWh/a), on renewable energy produced (in MWh/a) and on CO_2 emissions reduced (in tonnes/a) by your plan's time horizon, i.e. 2020, 2030 and/or other. Note that data on energy savings and renewable energy produced will depend on the type of action. If you have an action on installing photovoltaics in buildings, this will lead to renewable energy produced but not to energy savings. In this case you will only report the expected renewable energy to be produced and the associated CO_2 emissions reduced, while the energy savings will be zero.
	Renewable energy production	
	CO_2 reduction	

* Mandatory fields.
** A detailed list of categories and examples is provided in annex II.

In the case of actions added under the transport sector, you will still have the possibility to tick a box in the online template in order to report if your action targets the **municipal fleet**, the **public transport** or the **private and commercial transport**.

In addition, you can optionally identify which of your listed mitigation actions have also positive impacts for climate adaptation in your territory. You can do this, by selecting those actions at the end of the table under the field named 'Action also affecting adaptation'.

After completing the mandatory fields for each of your key actions, you can highlight some of them as **Benchmarks of Excellence (BoE)** by using the 'Select as Benchmark of Excellence' icon: ☆ at the end of the corresponding row in the table. Benchmarks of Excellence are actions which your local authority has **successfully implemented** and that have led to significant benefits. Only **ongoing** and **completed actions can be marked as BoE.**

After clicking on the icon to select an action as BoE in the online template, you will then navigate to the **BoE form**, in which you should provide more detailed information about your action, namely a short description, financing sources and key figures. You can also include links where more information can be found, a picture, a link to a video or upload a pdf document. In the Excel version of the template, you will have to navigate to the BoE tab.

The key figures included in the BoE form are essentially energy and financial figures. **Key energy figures** are the ones already included in the Key Mitigation Actions table, namely energy savings, renewable energy produced and CO_2 emissions reduced and are required fields to complete. There is an optional figure related to the number of **direct jobs created**. This refers to jobs that are created directly from the implementation of measures in energy efficiency or renewable energy, such as equipment and installation technicians, energy auditors, public transit operators, green building designers, architects and engineers, among others. You have also the opportunity to add **other figures** that you may find relevant to report for your particular action. This can be for instance the number of passenger-km travelled in public transport or the number of km of bicycle paths. **Key financial figures** allow municipalities to show the most cost-efficient measures they have implemented. A detailed description of key financial figures is provided in tables 9 and 10. These

figures are non-mandatory. If you enter the data listed in table 9 the system will automatically calculate the output figures as described in table 10.

Table 9 – Description of the input financial figures included in the Benchmarks of Excellence form.

Input field	Description
Life expectancy of the action	Number of years over which the action will generate energy savings or reduce CO_2 emissions.
Discount rate applied	Discounted rate applied to discount the financial savings and the cost of investment. This rate is used to calculate the Present Value of financial savings and the Net present Value of investment.
First year of investment	The year when the first investment has taken place (year 0).
Financial savings	Sum of yearly energy saved (ES) times price of energy (PE)*.
Investment costs	The additional investment linked to the improvement of efficiency or the decrease of CO_2 emissions.
Additional costs	Costs not related to the financing of the measure, e.g. costs incurred to keep an item in good condition and/or good working order. (Maintenance and operation costs/FTE, etc.)

* Please note: If possible, please use the Price of Energy (PE) related to the action in each year, otherwise please use the PE in year 1 as the reference year for the PE in the remaining years.

Table 10 – Description of the output financial figures included in the Benchmarks of Excellence form.

Output field	Description
Present Value (PV) of Financial savings	Sum of yearly energy saved (ES) times price of energy (PE) discounted back to its present value according to the formula: $F = \sum_{t=1...n} (ES*PE)/(1+r)t$ Where: ES = annual energy savings PE = price of energy r = discounted rate t = years of investment or years of financial saving n = life expectancy of investment or financial saving
Net Present Value (NPV) of Investment	Total financial savings minus total cost of investment calculated over the life expectancy and discounted back to its present value, calculated according to the formula: $NPVI = F - \sum_{t=1...n} I_t/(1+r)t$ Where: I_t = investment at year t r = discounted rate t = years of investment or years of financial saving n = life expectancy of investment or financial saving
Discounted Payback Period	Number of years taken to repay the investment. It is calculated by taking into account the present value of the (cumulative discounted) cash flow taking the start of the first period as zero point according to the formula: **Discounted Payback Period =** $A + \frac{B}{C}$ Where: A = last period with a negative discounted cumulative cash flow B = absolute value of discounted cumulative cash flow at the end of period A C = discounted cash flow during the period after A

Output field	Description
Return on Investment (ROI)	Calculated in % terms per year. Expected (discounted) financial savings minus the (discounted) amount originally invested/ divided the (discounted) amount originally invested times 100.

After completing the form, your BoE will be immediately integrated in the online catalogue of Benchmarks of Excellence.


BEÁGUEDA – THE ELECTRICAL BICYCLE OF ÁGUEDA FOR FREE PUBLIC USE

Sector: Land use planning
Implementation timeframe: 2010 - 2020
Responsible body: CMÁGueda/Private

Description:
BeÁgueda is based on SD commitments (CoM/LA21) and implemented in phases so that corresponds to citizens mobility needs: is assessed and re-evaluated based on surveys, usage and evaluation by end-users. It represents an investment in 10 e-bikes, parking and securing stands, a central station (microgeneration panel), monitoring/management system that communicates through WIMAX. beAgueda has already 160 users/more than 4000 usages/20000km in e-bike. Despite the early stage, the project was awarded by the Energy Cities as an innovative initiative that promotes CO2 reduction. For the future, an innovative tracking /monitoring system is being developed by BikeEmotion (UAveiro, private companies), allowing to track, in real time, the e-bike. The APP, allows any user with Smartphone or technology able to go on-line to find each e-bike is available, where it is, the charge, and book it

KEY FIGURES
- CO_2 reduction : 31 CO2 eq /a
- Energy savings: 9 MWh/a
- Renewable energy produced: 1 MWh/a
- Implementation cost: 220000 €
- In 2 years travelled: 20000 km

Financing sources: Local Authority's own resources, EU Funds & Programmes, Public-Private Partnerships

Link Video


LOW ENERGY RENOVATION AT KATJAS GATA 119, BACKA RÖD, GÖTEBORG

Sector: Buildings, equipment / facilities & industries
Implementation timeframe: 2009 - 2009
Responsible body: Förvaltnings AB Framtiden (housingcompany)

Description:
Katjas Gata 119, in Backa Röd, is a 4-storey residential building with 16 rental apartments. It was built in 1971 as a part of the Swedish "million program".
The objective with the energy renovation at Katjas Gata 119 was to reduce the energy use from 178 kWh/m² (Atemp) to approx. 60 kWh/m² and to give us knowledge about technical and economical problems and solutions and experiences from the clients point of view.
After the renovation the building energy consumption is between 50-60 kWh/m2 Atemp, year 2010-2012, which meets the objectives. The energy renovation resulted in better indoor climate compare to a normal renovation and the client are very satisfied with their living. The project didn't meet the city's demand on return of investment. To get a cost-effective project the building must be in need of renovation and preferably create more lettable area while renovating.

KEY FIGURES
- CO_2 reduction : 16 t CO2/a
- Energy savings: 160 MWh/a

Financing sources: Local Authority's own resources

Link

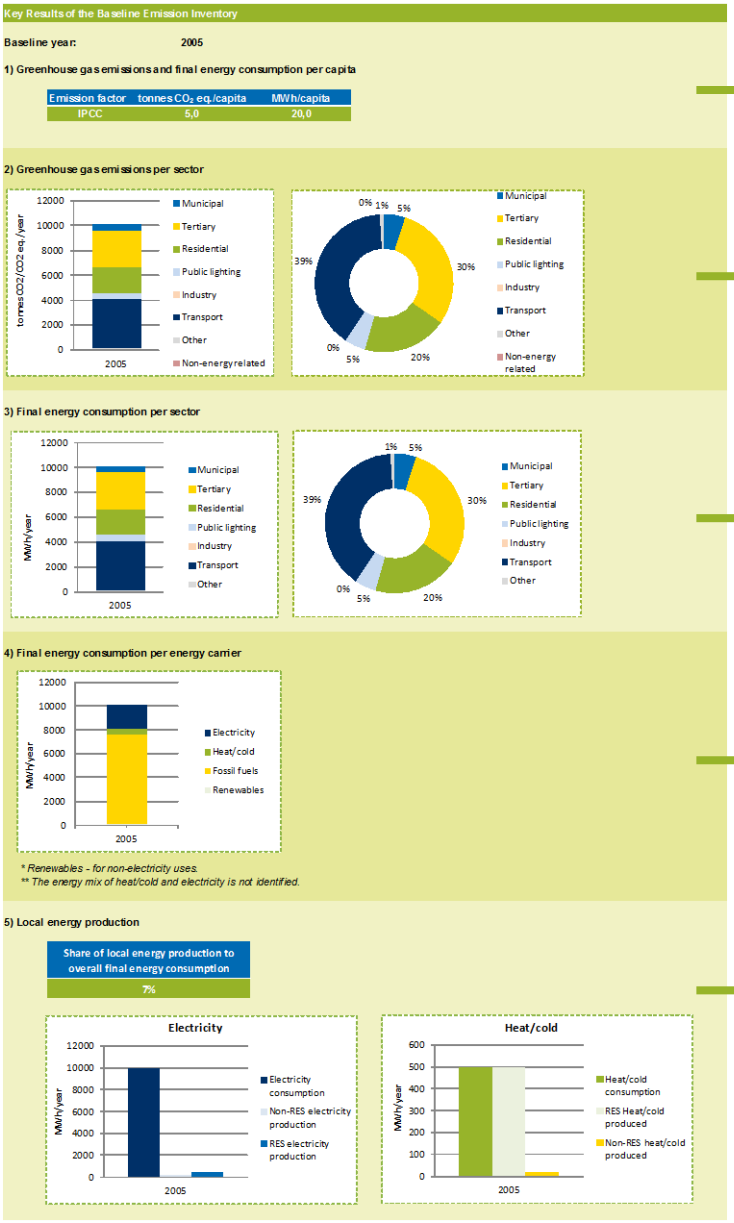
MITIGATION REPORT

The **Mitigation Report** is generated once the three parts of your template are completed ('Strategy', 'Emission Inventories' and 'Mitigation Actions'). It aims at presenting the information entered into these parts of the template in a **visual and concise manner**. It shows at a glance, with summary figures and graphs, the key results of the BEI and the key actions outlined in your action plan. Figures 8 and 9 show a screenshot of the resulting report.

In the online template, you can select, through simple **'publish' tick boxes**, which graphs you wish to display in the online Catalogue of action plans, under your respective public signatory profile. This allows making your progress and achievements visible to a broad audience as well as encouraging self-assessment and transparent sharing of the data reported.

Note that the level of detail of the graphs you visualise in your synthesis report depends on the level of aggregation of the data entered in the template.

Key Results of the Baseline Emission Inventory



1) GHG emissions and final energy consumption per capita

2) Sectoral breakdown of the GHG emissions

3) Sectoral breakdown of the final energy consumption

4) Breakdown of the final energy consumption by energy carrier (electricity, heat/cold, fossil fuels and renewables)

5) Share of local energy production (if any reported) in overall final energy consumption and local electricity and heat/cold production (renewable and non-renewable)

Figure 7 – Graphical representation of the emission inventory results.

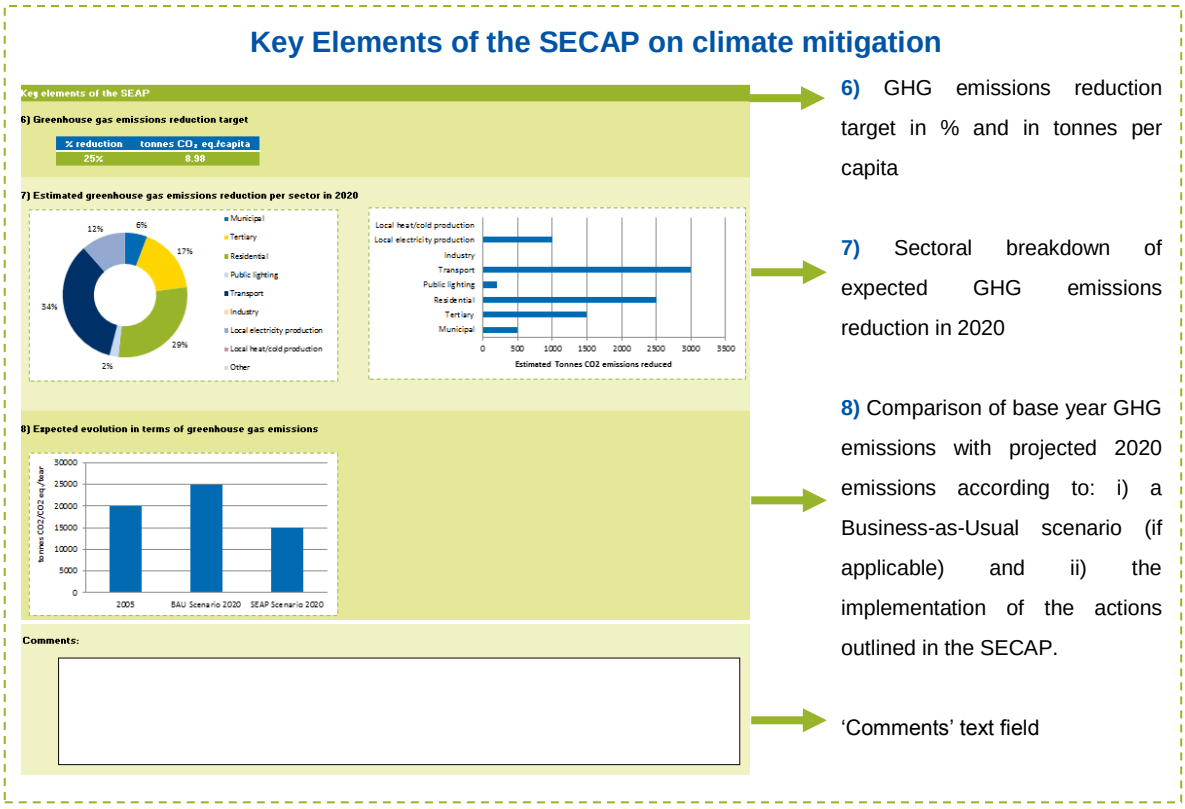


Figure 8 – Graphical representation of the key elements of the SECAP on climate mitigation.

Once the reporting process is completed, make sure to carefully review the generated graphs to spot any mistakes or if fields left incomplete during the data input steps.

If need be, you can also add - explanatory and/or analytical comments in the dedicated text box to ease the understanding of the graphs and tables. You can as well publish these comments in your public profile.

ADAPTATION SCOREBOARD

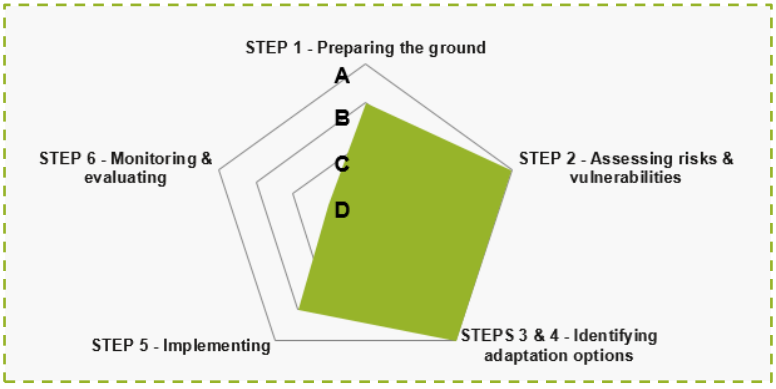
The purpose of the **Adaptation Scoreboard** is to provide a snapshot of the local authority's status in the adaptation process at a given point in time. In this tab, you will complete a self-assessment checklist, using the A-B-C-D scaling system (presented below).

Status Scale	Status	Indicative Completion Level
D	Not started or getting started	0-25 %
C	Moving forward	25-50 %
B	Forging ahead	50-75 %
A	Taking the lead	75-100 %

Please enter **your status** (from A to D as described above) in the **Self check of the Status** section for each **action** to be undertaken under the different **adaptation cycle steps**. Your average score will be automatically computed. You can also specify in the **Comments section** more details regarding current progress, next steps and / or areas of improvement (optional).

Adaptation cycle steps	Actions	Self check of the Status	Comments
STEP 1 - Preparing the ground for adaptation STRATEGY	Adaptation commitments defined/integrated into the local climate policy	A	
	Human, technical and financial resources identified	A	
	Adaptation team (officer) appointed within the municipal administration and clear respondibilities assigned	A	
	Horizontal (i.e. accross sectoral departments) coordination mechanisms in place	A	
	Vertical (i.e. accross governance levels) coordination mechanisms in place	B	
	Consultative and participatory mechanisms set up, fostering the multi-stakeholder engagement in the adaptation process	A	
	Continuous communication process in place (for the engagement of the different target audiences)	A	

The average status for every step is then visualised through the (automatically generated) spider graph at the top right of your screen. This shows you the areas which have been covered in greater depth (shaded in green) as well as areas you may wish to focus on in the future.



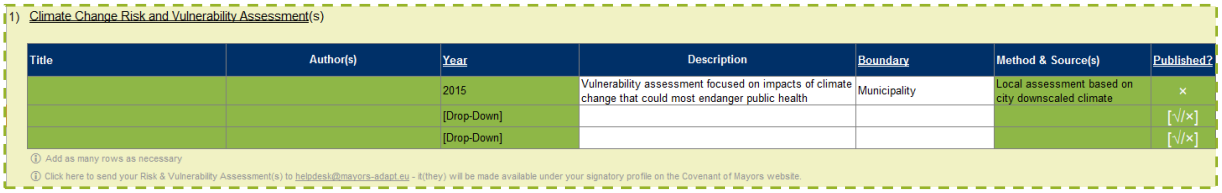
The following tabs: "Strategy", "Risks & Vulnerabilities" and "Actions" look at greater detail at the different steps of the adaptation cycle.

RISKS AND VULNERABILITIES

This tab is about describing any Climate Change Risk and Vulnerability Assessment(s) (RVAs) your local authority has undertaken to date. A RVA determines the nature and extent of a risk by analysing potential hazards and assessing the vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend. This can take the form of a single assessment or various assessments undertaken per sector, for example. It can also be different types of assessment, such as institutional risk assessments, a hazard assessment, a retrospective assessment of vulnerabilities to extreme weather such as a Local Climate Impacts Profile, for example.

1) Climate Change Risk and Vulnerability Assessment(s)

When you fill out the first table, please specify the **Year** when the Risk & Vulnerability Assessment was carried out. Specify the **Boundary** of your risk & vulnerability assessment (e.g. municipality, urban community/metropolitan area, province/region, other) and the **Method & Source(s)**.



1) Climate Change Risk and Vulnerability Assessment(s)

Title	Author(s)	Year	Description	Boundary	Method & Source(s)	Published?
		2015	Vulnerability assessment focused on impacts of climate change that could most endanger public health	Municipality	Local assessment based on city downscaled climate	×
		[Drop-Down]				[√/×]
		[Drop-Down]				[√/×]

ⓘ Add as many rows as necessary

ⓘ Click here to send your Risk & Vulnerability Assessment(s) to helpdesk@mayors-adapt.eu - it(they) will be made available under your signatory profile on the Covenant of Mayors website.

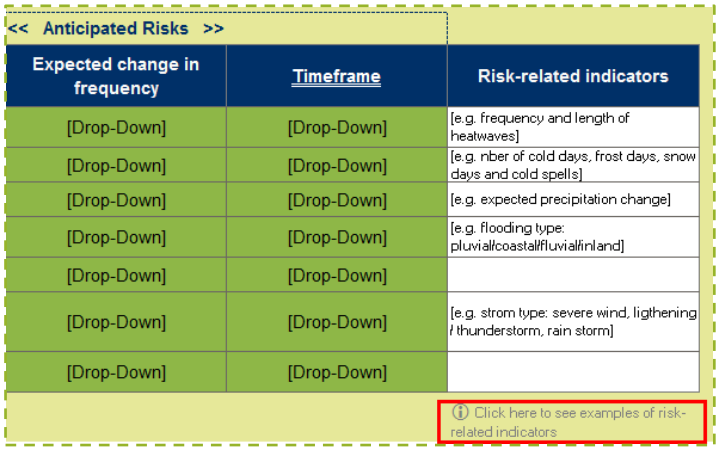
In case you have completed more than three assessments, please add a row in the table (in Excel: right click on the last row and select 'insert').

Your Risk & Vulnerability Assessment(s) must be sent to the Mayors Adapt office (helpdesk@mayors-adapt.eu) while the online template is not available for reporting. If you wish to make it / them available under your public signatory profile on the Covenant of Mayors website, please select: √ in the last section. Otherwise, please select: ×.

2) Climate hazard risks particularly relevant for your local authority or region

This section gives an overview of current and anticipated climate hazard types. In order to fill in the table, please first identify the climate hazard types that concern your local authority. For the applicable ones, complete the next four sections of the table: **current hazard risk level**, **expected change in intensity**, **expected change in frequency**, and **timeframe** in which you expect the risk frequency/intensity to change, using the proposed drop-down menus. Indicative timeframes that you could use include: current (now), short-term (0-5 years), medium-term (5-15 years), long-term (over 15 years) or not known.

The last section of the table (**Risk-related indicators**) is optional and allows you to be more specific (either through a short descriptive text or through selected indicator(s)) regarding the indicators that your local authority may use or might be developing, that link to the relevant climate hazards.

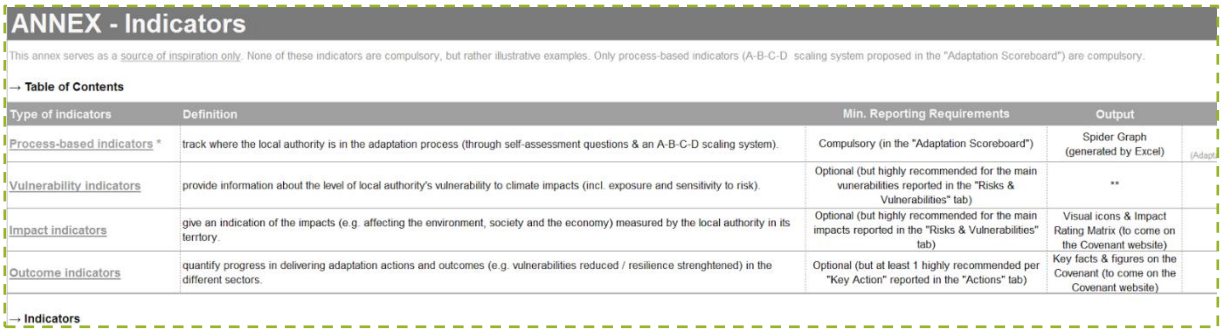


<< Anticipated Risks >>

Expected change in frequency	Timeframe	Risk-related indicators
[Drop-Down]	[Drop-Down]	[e.g. frequency and length of heatwaves]
[Drop-Down]	[Drop-Down]	[e.g. nber of cold days, frost days, snow days and cold spells]
[Drop-Down]	[Drop-Down]	[e.g. expected precipitation change]
[Drop-Down]	[Drop-Down]	[e.g. flooding type: pluvial/coastal/fluvial/inland]
[Drop-Down]	[Drop-Down]	
[Drop-Down]	[Drop-Down]	[e.g. strom type: severe wind, ligthening / thunderstorm, rain storm]
[Drop-Down]	[Drop-Down]	

ⓘ Click here to see examples of risk-related indicators

If you click on the icon underneath the table you will automatically be taken to the '**Indicators**' tab in the reporting template where you can find a few examples.



ANNEX - Indicators

This annex serves as a source of inspiration only. None of these indicators are compulsory, but rather illustrative examples. Only process-based indicators (A-B-C-D scaling system proposed in the "Adaptation Scoreboard") are compulsory.

→ Table of Contents

Type of indicators	Definition	Min. Reporting Requirements	Output
Process-based indicators *	track where the local authority is in the adaptation process (through self-assessment questions & an A-B-C-D scaling system).	Compulsory (in the "Adaptation Scoreboard")	Spider Graph (generated by Excel)
Vulnerability indicators	provide information about the level of local authority's vulnerability to climate impacts (incl. exposure and sensitivity to risk).	Optional (but highly recommended for the main vunerabilities reported in the "Risks & Vulnerabilities" tab)	**
Impact indicators	give an indication of the impacts (e.g. affecting the environment, society and the economy) measured by the local authority in its territory.	Optional (but highly recommended for the main impacts reported in the "Risks & Vulnerabilities" tab)	Visual icons & Impact Rating Matrix (to come on the Covenant website)
Outcome indicators	quantify progress in delivering adaptation actions and outcomes (e.g. vulnerabilities reduced / resilience strenghtened) in the different sectors.	Optional (but at least 1 highly recommended per "Key Action" reported in the "Actions" tab)	Key facts & figures on the Covenant (to come on the Covenant website)

→ Indicators

Some examples of indicators include (see full list in annex IV):

- Vulnerability-related indicators
  - Number of days/nights with extreme temperature
  - Frequency of heat/cold waves
  - Number of day/nights with extreme precipitation
  - Number of consecutive days/nights without rainfall
- Impact-related indicators
  - Number or % of (public / residential / tertiary) buildings and other (transport / energy / water / ICT) infrastructures damaged by extreme weather conditions/events
  - % of grey/blue/green areas affected by extreme weather conditions/events
  - Number of days with public service interruptions

This 'Indicators' annex serves as a source of inspiration; none of these indicators listed are compulsory, but are rather illustrative examples. The use of 'vulnerability indicators' provides information about the level of a local authority's vulnerability to climate impacts, including exposure and sensitivity to risk.

The following picture gives you an example of how to complete the table.

	<< Current Risks >>	<< Anticipated Risks >>			
Climate Hazard Type	Current hazard risk level	Expected change in intensity	Expected change in frequency	Timeframe	Risk-related indicators
Extreme Heat	Moderate	Increase	No change	Short-term	The number of heatwave days will increase to 30 or even 50
Extreme Cold	Low	No change	No change	Medium-term	
Extreme Precipitation	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Floods	High	Increase	Increase	Medium-term	Pluvial flooding
Sea Level Rise	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Droughts	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Storms	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	Severe wind, rain storm
Landslides	High	No change	Increase	Current	
Forest Fires	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Other [please specify]	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	

ⓘ Hide the rows that do not concern your local authority

ⓘ To be completed for the climate hazards that concern your local authority only.

ⓘ Click here to see examples of risk-related indicators

In the Excel version, if you want to hide rows that do not concern your local authority, please right click on the row that you want to hide and click 'hide'.

3) Vulnerabilities of your local authority or region

This section asks you to describe the type of vulnerabilities faced in broad terms. This can be understood as the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.

- For the **Socio-Economic Vulnerability Type**, please describe the socio-economic vulnerabilities of your territory (e.g. population composition, population density, economic situation) as well as the factors that tend to increase them.
- For the **Physical and Environmental Vulnerability Type**, please describe the main physical and environmental vulnerabilities of your territory (e.g. geographical location, topography, spatial planning, physical conditions) as well as the factors that tend to increase them.

Vulnerability Type	Vulnerability Description	Vulnerability-related indicators
Socio-Economic:	There are several infrastructural elements in city that might be affected, including important roads, which can result in the local economy being negatively impacted. The increase in temepratures will likely increase energy demand for cooling in the summer, which could lead to electricity oiutages and problems. Heat weaves will affect old citizens and lastly, droughts are likely to impact the local water supply, which is essential and affects all sectors.	% share of sensitive population groups (e.g. elderly (65+)/young (25-) people % of areas non-accessible for emergency / firefighting services
Physical and Environmental:	There are some small rivers which can be affected by flooding. Forest fire risk and insect plagues/invasive species will lead to a decrease in the quality of the natural environment and biodiversity. Since much of the area's water comes from watersheds ouside of the municipality's boundaries, problems in those watersheds can also impact all sectors in our city. Drought periods will also affect the quality of the urban area.	% of protected (ecologically and/or culturally sensitive) areas / % of forest cover % change in average annual/monthly precipitation

ⓘ Click here to see examples of vulnerability-related indicators

In the last section of the table, please list '**Vulnerability-related indicators**'. You can find examples in the '**Indicators**' tab which you are automatically linked to when you click on the icon underneath the table. An example of indicators can be found in the table below (see the full list in annex IV).

Vulnerability Type	Vulnerability-related indicators	Unit	Base year	Expected Change
Climatic	Number of days/nights with extreme temperature (compared to ref. annual/seasonal temperatures at day/night times)	Nber of days/nights		
Climatic	Frequency of heat/cold waves	Average per monthly/year		
Climatic	Number of days/nights with extreme precipitation (compared to ref. annual/seasonal precipitation at day/night times for each season)	Nber of days/nights		
Climatic	Number of consecutive days/nights without rainfall	Nber of days/nights		
Socio-economic	Current population vs. projections 2020/2030/2050	Nber of inhab.		
Socio-economic	Population density (compared to national/regional average in year X in country/region X)	People per km^2		
Socio-economic	% share of sensitive population groups (e.g. elderly (65+)/young (25-) people, lonely pensioner households, low-income/unemployed households) - compared to national average in year X in country X	%		

4) Expected impacts in your local authority or region

This section asks you to list policy sectors that are impacted in your local authority. For the **impacted policy sectors** that you can identify, please complete the four columns of the table. You can indicate what aspects of the specific sectors are concerned and how via the '**Expected impact(s)'** column. The last column, **'Impact-related Indicators'**, can also be used for this purpose and is optional. It allows you to be more specific (either through a short descriptive text or through selected indicator(s).

Impacted Policy Sector	Expected Impact(s)	Likelihood of Occurrence	Expected Impact Level	Timeframe	Impact-related indicators
Buildings	(e.g. Increased Demand for Cooling and Insulation)	Unlikely	Low	Short-term	
Transport	(e.g. Damage to Infrastructure)	Possible	Moderate	Medium-term	
Energy	(e.g. Damage to Electricical Infrastructure and Power Generation Facilities)	Likely	High	Current	e.g. Nber of days with public service interruptions
Water	(e.g. Increasing Water Scarcity & Droughts)	Not known	Not Known	Long-term	
Waste	(e.g. Damage to Infrastructure and Treatment/Processing Facilities)	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Land Use Planning	(e.g. Urban Heat Island Effect, Erosion, Floods)	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Agriculture & Forestry	(e.g. Crop Yield Degradation, Livestock Production Degradation, Forest Health and Productivitiy Degradation)	Unlikely	Moderate	Medium-term	
Environment & Biodiversity	(e.g. Ecosystem Degradation, Species Migration, Insect Infestation)	[Drop-Down]	[Drop-Down]	[Drop-Down]	
Health	(e.g. Increase Disease and Mortality Rates)	[Drop-Down]	[Drop-Down]	Current	
Civil Protection & Emergency	(e.g. Increasing Number of Disasters/Deployments)	[Drop-Down]	Moderate	[Drop-Down]	
Tourism	(e.g. Decline in Tourism Demand)	Likely	[Drop-Down]	[Drop-Down]	
Other	(e.g. Decrease in Private Sector Engagement)	[Drop-Down]	[Drop-Down]	Not known	

The table below defines the pre-defined policy sectors.

Table 1 – Description of the sectors

Sector	Description
Buildings	Refers to any (municipal/residential/tertiary, public/private) structure or groups of structures, surrounding spaces, permanently constructed or erected on its site.
Transport	Includes road, rail, air and water transport networks and related infrastructure (e.g. roads, bridges, hubs, tunnels, ports and airports). It comprises an extensive range of both public and private assets and services and excludes all related vessels, vehicles (and related parts and processes).
Energy	Refers to the energy supply service and related infrastructure (generation, transmission & distribution networks, all energy types). It includes coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity and heat.
Water	Refers to the water supply service and related infrastructure. It also covers water use (e.g. by households, industry, energy production, agriculture, etc.) and (waste-, rain-) water management system, that includes sewers, drainage and treatment systems (i.e. the process to render waste water fit to meet environmental standards or other quality norms, as well as to cope with excess rain or storm water).
Waste	Includes activities related to the management (including collection, treatment and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites.

Sector	Description
Land Use Planning	Process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans or regulations that describe the permitted or acceptable uses.
Agriculture & Forestry	Includes land classified / designated for agriculture & forestry use, as well as organisations and industries linked to creation and production within and surrounding the boundaries of the municipality. It includes animal husbandry, aquaculture, agroforestry, beekeeping, horticulture and other agriculture & forestry management and services in the area.
Environment & Biodiversity	Environment refers to green and blue landscapes, air quality, including urban hinterland; Biodiversity refers to the variety of life in a specific region, measurable as the variety within species, between species, and the variety of ecosystems.
Health	Refers to the geographical distribution of dominance of pathologies (allergies, cancers, respiratory and heart diseases, etc.), information indicating the effect on health (biomarkers, decline of fertility, epidemics) or well-being of humans (fatigue, stress, post-traumatic stress disorder, death etc.) linked directly (air pollution, heat waves, droughts, severe flood events, ground level ozone , noise, etc.) or indirectly (food / water quality and availability, genetically modified organisms, etc.) to the quality of the environment. It also includes the health care service and related infrastructure (e.g. hospitals).
Civil Protection and Emergency	Refers to the operation of the civil protection and emergency services by or on behalf of public authorities (e.g. civil protection authorities, police, fire-fighters, ambulance, paramedic and emergency medicine services) and includes local disaster risk reduction and management (i.e. capacity building, coordination, equipment, emergency planning etc.).
Tourism	Refers to the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited.
Other	Any other sectors (e.g. Information and Communication Technologies (ICT), Industry, Financial)

In the Excel version, if you want to hide rows that do not concern your local authority, please right click on the specific row that you want to hide and click 'hide'. If you click on the icon on the right underneath the table, you can see examples of impact & sector-related indicators.

ADAPTATION ACTIONS

1) Adaptation Action Plans

The section 1) asks you to list your **local Adaptation Action Plan** and other planning documents where adaptation has been integrated (if any). For each document, specify the title, the date of adoption (in case it has been adopted by the municipal council), the language (English or national language) and provide a short description (max. 300 characters).

Your local Adaptation Plan (as adopted by the municipal council) must be sent to: helpdesk@mayors-adapt.eu while the online template is not available for reporting. It will be published under your signatory profile on the Covenant of Mayors website. For the other submitted documents, you can specify in the last section if you wish to make them public (√ : yes | × : no). You can add as many rows as necessary in this table. Please also specify how adaptation is mainstreamed into other policy fields / sector plans in the section **Adaptation mainstreaming into other policy fields.**

2) Adaptation Actions

This section asks you to list your adaptation actions in the table. Actions can be comprehensive or can be a smaller list of selected examples demonstrating the range or types of actions that your local authority has committed to undertaking. Actions would be taken directly from one or more of the documents cited by the local authority in the section above.

Start by choosing a **'Sector'** from the drop-down menu in the first column, then continue filling in the subsequent fields.

Sector	Title (max. 120 chars)	Short Description (max. 300 chars)	Responsible body/department	Implementation timeframe		Implementation status
				Start	End	
Other	Compendium of climatic assessments for the greater municipal region	A report was published in the late-2000s that provides a compendium of climatic assessments for the greater municipal region. It includes maps of a variety of information that can help planners optimize new projects and retrofits for climate change.	Urban climatology department	2006	2008	Completed
Land Use Planning	Protecting at-risk natural areas and greening actions	In line with the abovementioned climatic assessments, the city placed a large portion of the city under the protection of nature conservation orders. The city has also stepped up its efforts to increase the amount of green space with a total of over 250,000 square meters of green roofs and over 30 kilometers of green tram tracks to name a few.	Urban climatology department	2008	2012	Completed
Land Use Planning	Building ban	As a result of climatic assessments, the city administration has banned buildings in the hilly areas around the town and prevented building projects that might obstruct the ventilation effect of cold air flows at night	Office of urban planning and renewal & office of environmental protection	2008	2016	Ongoing

Similarly to the 'Mitigation Actions' part, you can optionally identify which of your listed adaptation actions have also positive impacts for climate mitigation. You can do this, by selecting those actions under the field named '**Action also affecting mitigation**'.

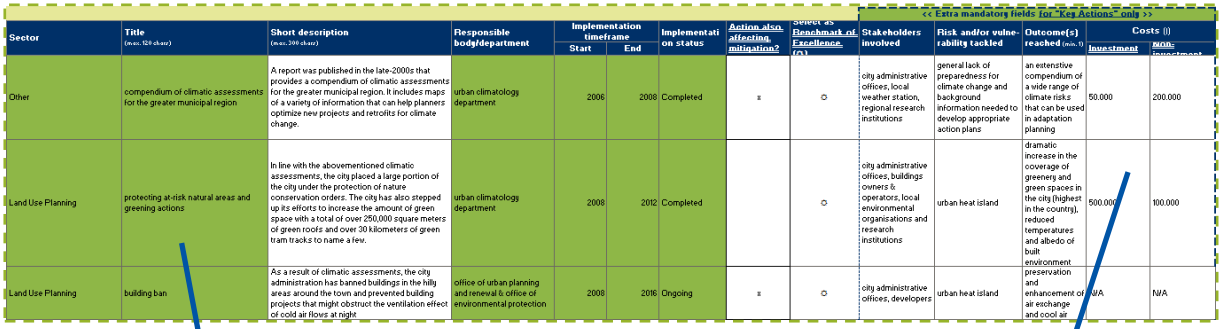
Please also select ☼ in the following field: '**Select as Key Action/Benchmark of Excellence**' if you would like to designate this action as a Key Action/Benchmark of Excellence that your local authority has successfully implemented and that has led to significant benefits. For your selected **Key Actions/Benchmarks of Excellence**, filling in the subsequent fields is compulsory. These Key Actions will be promoted through the online catalogue of Benchmarks of Excellence and other material.

Note:

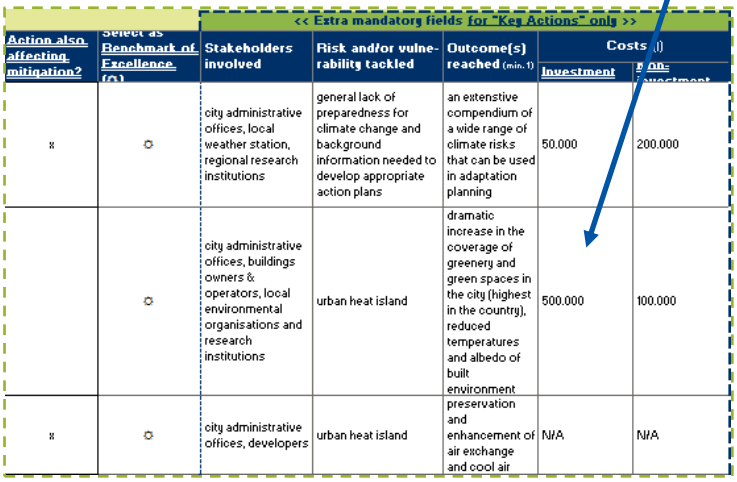
- **Only ongoing and completed actions can be marked as Key Action/Benchmark of Excellence.**
- **Selecting at least three actions is a compulsory requirement for those local authorities who are reporting four years following the formal signing of the commitment.**

Please note that at the end of this table, **Investment** in refers to the capital costs (in EUR) invested in the specific key action and **Non-Investment** refers to operating cost or other non-investment costs (in EUR).

When completed the entire table will appear as follows:



Sector	Title (max. 120 chars)	Short Description (max. 300 chars)	Responsible body/department	Implementation timeframe		Implementation status
				Start	End	
Other	Compendium of climatic assessments for the greater municipal region	A report was published in the late-2000s that provides a compendium of climatic assessments for the greater municipal region. It includes maps of a variety of information that can help planners optimize new projects and retrofits for climate change.	Urban climatology department	2006	2008	Completed
Land Use Planning	Protecting at-risk natural areas and greening actions	In line with the abovementioned climatic assessments, the city placed a large portion of the city under the protection of nature conservation orders. The city has also stepped up its efforts to increase the amount of green space with a total of over 250,000 square meters of green roofs and over 30 kilometers of green tram tracks to name a few.	Urban climatology department	2008	2012	Completed
Land Use Planning	Building ban	As a result of climatic assessments, the city administration has banned buildings in the hilly areas around the town and prevented building projects that might obstruct the ventilation effect of cold air flows at night	Office of urban planning and renewal & office of environmental protection	2008	2016	Ongoing



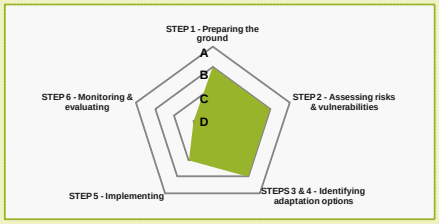
Action also affecting mitigation?	Select as Benchmark of Excellence (2)	<< Extra mandatory fields for "Key Actions" only >> Stakeholders involved	Risk and/or vulnerability tackled	Outcome(s) reached (min. 1)	Costs (I) Investment	Costs (I) Non-investment
x	○	city administrative offices, local weather station, regional research institutions	general lack of preparedness for climate change and background information needed to develop appropriate action plans	an extenstive compendium of a wide range of climate risks that can be used in adaptation planning	50.000	200.000
	○	city administrative offices, buildings owners & operators, local environmental organisations and research institutions	urban heat island	dramatic increase in the coverage of greenery and green spaces in the city (highest in the country), reduced temperatures and albedo of built environment	500.000	100.000
x	○	city administrative offices, developers	urban heat island	preservation and enhancement of air exchange and cool air	NA	NA

ADAPTATION REPORT

The **Adaptation Report** tab includes graphs and other visual elements automatically generated by the template. It aims to show at a glance where you are in the adaptation process. It summarises the information you have entered into the previous tabs ('Adaptation Scoreboard', 'Risks & Vulnerabilities', 'Actions'). These results can be used to **inform and support decision-makers**, but also to **communicate to general public and key partners**.

1) Signatory Status in the Adaptation Cycle

[Source: "Signatory Scoreboard" tab]



D: Not started or getting started
C: Moving forw ard
B: Forging ahead
A: Taking the lead

2) Risk Rating Matrix

[Source: "Risks & Vulnerabilities" tab]

Climate Hazard Type	Risk Level	Expected change in intensity	Expected change in frequency	Timeframe
Extreme Heat	!!	↑	↔	►
Extreme Cold	!	↔	↔	►►
Extreme Precipitation				
Floods	!!!	↑	↑	►►
Sea Level Rise				
Droughts				
Storms				
Landslides	!!!	↔	↑	|
Forest Fires				
Other [please specify]				

!: Low	↑: Increase	|: Current
!!: Moderate	↓: Decrease	►: Short-term
!!!: High	↔: No change	►►: Medium-term
[?]: Not Know n	[?]: Not know n	|►►►: Long-term
		[?]: Not know n

3) Impact Rating Matrix

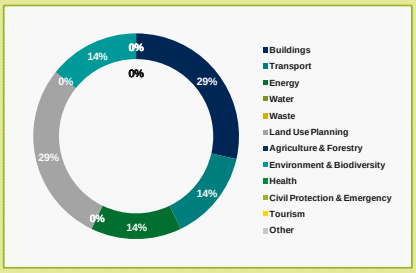
[Source: "Risks & Vulnerabilities" tab]

Impacted Policy Sector	Likelihood of Occurrence	Expected Impact Level	Timeframe
Buildings	*Possible*	!!	►►
Transport	*Likely*	!!!	►►
Energy	*Likely*	!!!	►
Water			
Waste			
Land Use Planning			
Agriculture & Forestry			
Environment & Biodiversity			
Health			
Civil Protection & Emergency			
Tourism	*Unlikely*	!	►►
Other			

!: Low	|: Current
!!: Moderate	►: Short-term
!!!: High	►►: Medium-term
[?]: Not Know n	|►►►: Long-term
	[?]: Not know n

4) (Reported) Adaptation Actions by Sector

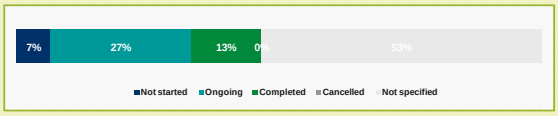
[Source: "Actions" tab]



Sector	Number of reported actions
Buildings	2
Transport	1
Energy	1
Water	0
Waste	0
Land Use Planning	2
Agriculture & Forestry	0
Environment & Biodiversity	1
Health	0
Civil Protection & Emergency	0
Tourism	0
Other	0

4) Status of the (Reported) Adaptation Actions

[Source: "Actions" tab]



Action Status	Number of reported actions	
Not started	1	7%
Ongoing	4	27%
Completed	2	13%
Cancelled	0	0%
Not specified	8	53%
Total:	15	

5) Comments

SECTION II – MONITORING TEMPLATE

STRATEGY STATUS

Most of the fields in this part are **pre-filled** with the information you have provided in the SECAP template at the submission stage. Please check and update them all.

In addition, the following new fields should be filled in:

4) Staff capacity allocated

Please specify the nature of the staff involved in the implementation of your action plan (now mandatory).

Type	Plan Preparation		Plan Implementation
		Full-time equivalent job(s)	
Local authority	x	1	x
Covenant Coordinator	x	0,5	x
Covenant Supporter	x	0,5	x
External consultant			
Other			x
Total		2	

6) Overall budget spent so far on the implementation and financing sources

Please select the origin of the money already spent for implementing mitigation and adaptation actions, namely from local authority's own resources and/or from other actors' resources. Please specify the amount of money already spent in **euros** split into **investment** and **non-investment costs**. Please note that investment costs refer specifically to the capital to be invested, while non-investment costs integrate all operational and running costs, e.g. maintenance costs, people's wages as well as other non-investment costs. The **time period** is to be indicated as well. Your baseline year and the current year when you are carrying out the monitoring will appear selected by default as start time and end time respectively, but you can edit them.

Source	Budget spent so far for plan implementation (€)					
	Mitigation			Adaptation		
		Investment (€)	Non-investment (€)		Investment (€)	Non-investment (€)
Local Authority's own resources	x	30000	10000	x	40000	
Other actors:	x	50000		x		
- National Funds & Programmes	x			x	50000	
- EU Funds & Programmes	x			x		
- Private	x			x		
	ⓘ Select x for the ones applicable.					
Time period	2005	2015		11 years		

7) Monitoring Process

A new table appears where you can identify the main barriers encountered during the implementation of your action plan by using a qualitative intensity scale in the drop-down menu (little, fair, strong, not applicable). You can either choose to report your barriers in general for all sectors or report them individually for each Covenant key mitigation and adaptation sector.

MONITORING EMISSION INVENTORY

In this section, you are invited to include your **latest Monitoring Emission Inventory** (MEI). Covenant Signatories are encouraged to compile MEIs on a regular basis. The minimum requirement in the context of the Covenant of Mayors is to do it **every 4 years**. In this way, subsequent inventories may be compared with the Baseline Emission Inventory (BEI), and progress in terms of emissions reduction can be monitored. A MEI for the target year should as well be provided once you have the available data in order to assess the achievement of your CO_2 emissions reduction target.

As the reporting structure for the MEI is exactly the same as for the BEI, please refer to the 'Emission Inventories' chapter of the SECAP template to get further instructions on how to fill it in.

As a first step you should start by selecting the year to which your MEI corresponds in the **Inventory year** field.

Note that some fields will be pre-filled with information that you have provided in your BEI. For instance, in the online template the sectors included in your BEI will appear ticked by default and you will also be able to visualise the emission factors entered in the BEI in table C1.

Note that your CO_2 emissions calculation approach and reporting units must remain the same across the different emission inventories. Consequently, these fields are non-editable in the MEI part of the online template.

Modifications in previously submitted emission inventories are not recommended, unless it is needed to ensure consistency among emission inventories.

MITIGATION ACTIONS IMPLEMENTATION STATUS

This part aims at monitoring the implementation status of your actions. In the online template, the 'Key actions' table is pre-filled with the actions you have specified in the SECAP online template.

In the online template, you can add an action by clicking on 'Add action':  under the respective sector. If you wish to delete an action, please click on 'Delete action':  , if you wish to edit, then click on 'Edit action':  . Note that if you delete an action that has an associated BoE it will delete as well your BoE.

Regarding your pre-filled actions, if not previously done in the SECAP template, you should first identify, for each action, the **area of intervention** and the **policy instrument** as well as indicate the **origin of the action**. Please refer to Mitigation Action Part of Section I – SECAP template for further instructions and to annex II where you can find a detailed list of the categories with examples.

Please check and update, when necessary, the pre-filled fields from the SECAP template regarding your actions, e.g. area of intervention, policy instrument, responsible body, implementation timeframe, among others.

One extra required field allows you to select, through a dedicated drop-down menu, the **implementation status** of your actions:

- Completed – for actions that are concluded;
- Ongoing – for actions that are currently being implemented;
- Postponed – for actions whose start time has been postponed compared to initial schedule (as defined in the SECAP template, 'implementation timeframe' columns);
- Not started – for actions that will start at a later stage, according to schedule.
- New – for new actions that are included at the monitoring stage. This could be for instance the case of corrective actions.

In the **'implementation cost spent so far**' field, please specify the amount of money spent (in euros) for implementing the actions. The implementation cost refers to the sum of the capital invested and the associated operational and running costs (all funding sources included).

You should also **update the impacts of the actions that you can already assess**. This is the case of some of your completed actions.

For example, if you have completed an action described as 'Improving the building envelope of the public library', you can report the measured savings based on information reported on the energy bills for the base year and for the monitoring year. If instead you have completed the action 'Building code: energy performance standards for refurbished buildings', in most cases just a minor part of the expected annual savings in 2020 will have been achieved in the monitoring year, e.g. 15 buildings have already been refurbished according to the standards foreseen in the related action line and it is expected that 30 more buildings of the same construction type will be refurbished between the monitoring year and 2020, with similar annual unitary savings. In such case, the signatory can:

- Revise the 2020 estimates based on the knowledge gained from the first group of refurbished buildings;
- Keep the same estimates as reported in the SECAP, if they are well in line with the savings achieved by the first group of buildings.

If relevant, you might also check and update the 2020 estimates for ongoing, postponed or not started actions.

It is important to highlight that all the estimates are to be reported as annual figures in your target year(s), assuming that at that time the action will have reached its full potential. You are not required to report estimates based on present level of implementation of the action.

Finally, in the online monitoring template you have to highlight a **minimum of three actions** as **Benchmarks of Excellence**. To do so, click on the 'Select as Benchmark of Excellence' icon: ☆ the end of the corresponding row in the table. If you have already selected actions as BoEs in your SECAP template, please check that the information previously provided is still up-to-date (especially the associated figures). Please refer to section 8 of the 'Mitigation Actions' part of the SECAP template for further instructions.

MITIGATION REPORT

Similarly to the Mitigation Report available for your action plan, the **Monitoring Report** is generated at the end of the completion of the monitoring template. The resulting graphical elements ease the follow-up of the implementation of your action plan (e.g. the degree of implementation of the actions per sector, the budget spent so far), and showcase the progress already achieved (e.g. by comparing the results of the BEI with the results of the successive MEIs), thus enabling a meaningful trend analysis over time. Figures 10 and 11 provide an illustration of the Monitoring Report.

In the online template, you can select, through simple **'publish' tick boxes**, which graphs you would like to display in the online Catalogue of Monitoring reports, under your public signatory profile.

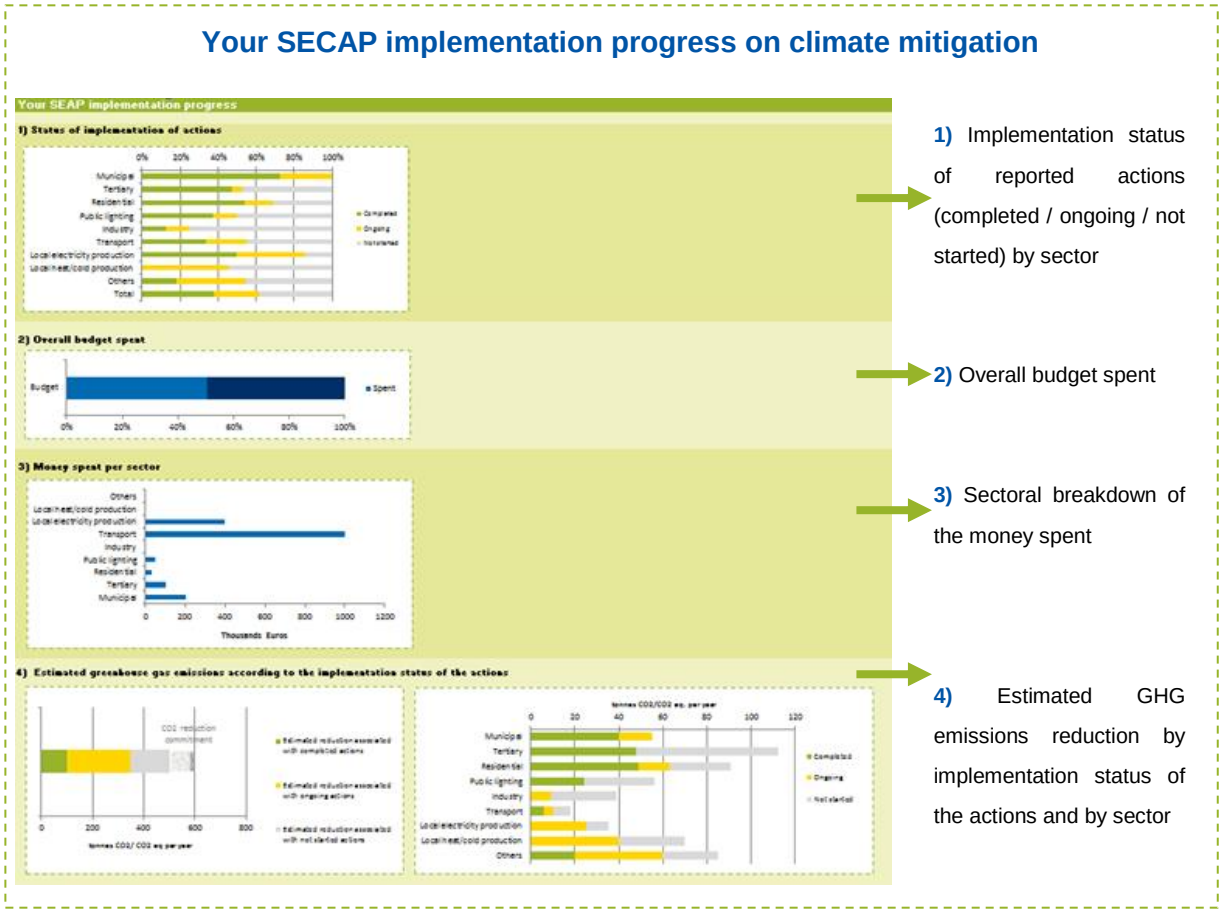
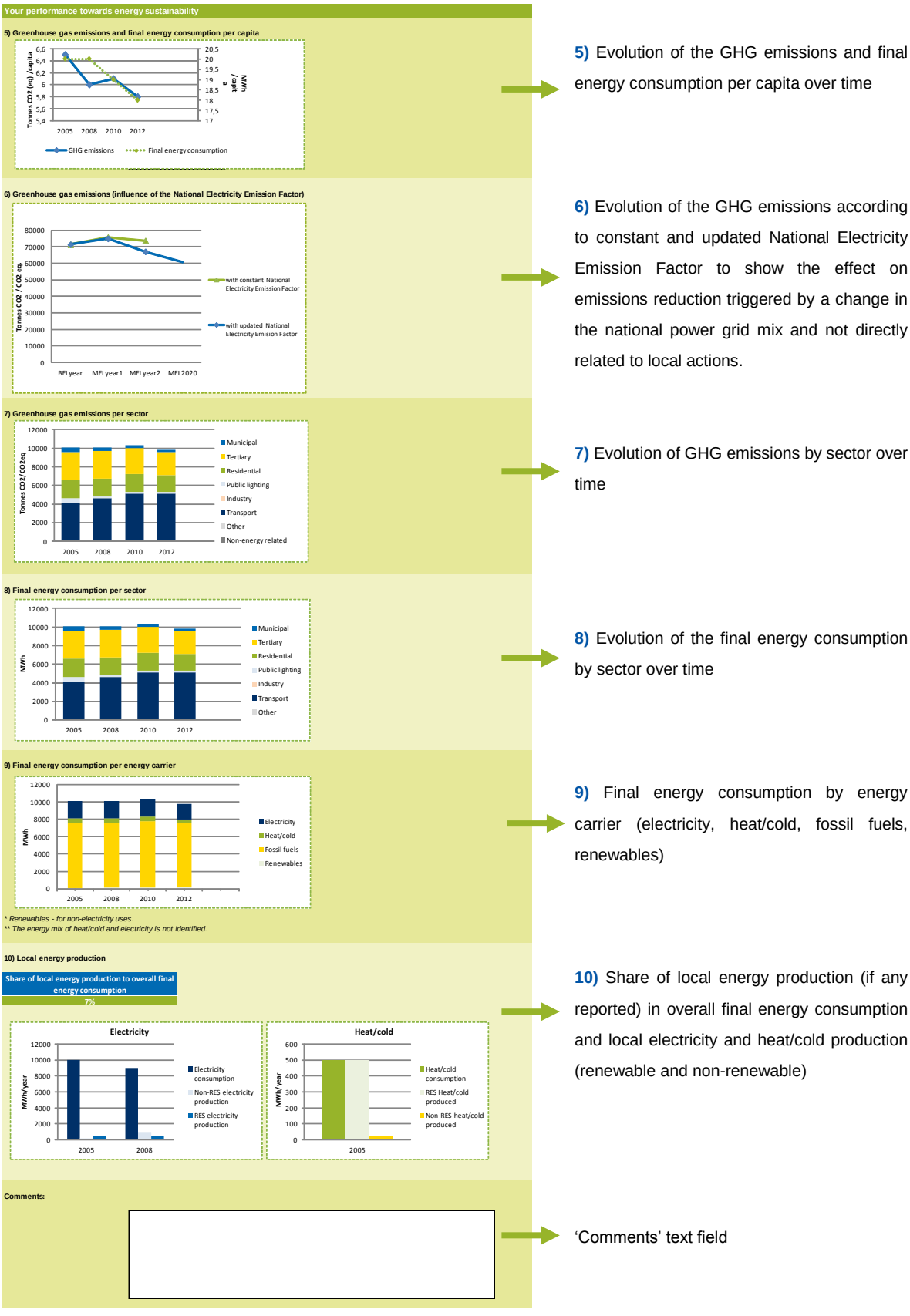


Figure 9 – Graphical representation of your SECAP implementation progress on climate mitigation.

Your performance towards energy sustainability and climate mitigation



5) Evolution of the GHG emissions and final energy consumption per capita over time

6) Evolution of the GHG emissions according to constant and updated National Electricity Emission Factor to show the effect on emissions reduction triggered by a change in the national power grid mix and not directly related to local actions.

7) Evolution of GHG emissions by sector over time

8) Evolution of the final energy consumption by sector over time

9) Final energy consumption by energy carrier (electricity, heat/cold, fossil fuels, renewables)

10) Share of local energy production (if any reported) in overall final energy consumption and local electricity and heat/cold production (renewable and non-renewable)

'Comments' text field

Figure 10 – Graphical representation of your performance towards energy sustainability and climate mitigation.

ADAPTATION ACTIONS

Four years after adhesion, signatories are required to report on **at least three key adaptation actions.** Only ongoing or completed actions can be marked as Benchmarks of Excellence. For more information, see the 'Adaptation Actions' section under Section I – SECAP Template of these guidelines.

STEP II – UPLOAD DOCUMENT

Action Plan upload

When filling in your template online, as soon as you complete the different parts, you can proceed to the next step and go to the 'Upload document' under the 'Action Plan' section. You must upload here your action plan document. You can also upload your adaptation strategy and/or other related planning documents (where adaptation is mainstreamed) in case they are separate documents. Further supporting documentation or annexes may also be uploaded under the 'Other documents' section (e.g. your risk and vulnerability assessment(s)).

Specify the filename and the language. The filename should not contain any special characters or spaces. Use the 'Browse' button to locate your file and click the 'save' button so that your file can be duly stored. Your action plan's document will be automatically available in your public signatory profile. You may also decide to make other documents public or not by ticking the 'published online' box.

For the document upload, you should use the PDF format. Other file formats (also zipped or compressed) will not be accepted by the system. Both commercial and free tools to convert files to PDF format are widely available on the internet.

Monitoring report upload

At the monitoring stage, **only the 'monitoring template' is required** to be completed and submitted. Therefore, you may upload a document reporting in greater details the implementation of your action plan (or eventually an updated version of your action plan if you have any) or directly proceed to the next step (see step 3). The uploading procedure is the same as above.

STEP III – CHECK AND SUBMIT

Preliminary integrated checking[6] (for the mitigation part of the template only)

Before proceeding to the final online submission, the system gives you the opportunity of a preliminary checking of your template, allowing the detection of errors or inconsistencies. For this, you should click on the **'See notification checklist'** button. Table 11 presents examples of some of the checks to be carried out in the SECAP template. Another set of checks will be carried out on the monitoring template.

Table 11 – Examples of checks to be carried out to the data inserted in the SECAP template.

Type of checks	What?	Where?
Completeness	The emission inventory data for each key sector and for certain energy carriers (e.g. electricity) is complete.	Emission inventories
	The implementation cost data and expected impacts in the target year are given for most of the actions reported.	Mitigation actions
	The key actions reported account for at least 70% of the total estimated impacts in the target year.	Mitigation actions
Internal consistency	The estimates on CO_2 emissions reduction and energy savings provided in the Key Mitigation Actions table are lower than the ones reported in BEI for 'Buildings, equipment/facilities' and 'Transport'.	Emission inventories Mitigation actions
	If heat/cold consumption is reported in table A, heat/cold production must be reported in table B4 and vice versa.	Emission inventories
Comparison with default values	The IPCC/LCA emission factors (for most of the energy carriers but also for certified green electricity and electricity not produced locally – when applicable) are compared with default values, as defined in annex I. If the value differs significantly from a pre-defined threshold, the difference is pointed out.	Emission inventories
	Total emissions are compared with national averages for the respective year.	Emission inventories
	Final energy consumption by energy carrier and by sector is compared with respective national averages.	Emission inventories
Correctness vis-a-vis Covenant methodological principles	The electricity generated locally is higher than the electricity consumed.	Emission inventories
	The criteria for including the local electricity production plants in your emission inventory are respected (large power plants with more than 20MW should be excluded).	Emission inventories Mitigation actions
	The biomass and biofuels considered in your emission inventories come from a well-identified and sustainable source.	Emission inventories

The preliminary checking system is merely proposed to ensure that your template is **internally consistent** and **the basic Covenant requirements are met**. These checks are mainly informative and are run through a parallel online application, developed and managed by the JRC. If notifications

[6] The Preliminary checking tool will be available in 2017. Checks concerning the adaptation fields could be added at a later stage.

are reported, it is up to you to address or to acknowledge them before proceeding with the final submission of your action plan or monitoring template.

The preliminary automatic checking in the JRC's application will not guarantee that your action plan will be 'accepted'. The system tries to detect the most obvious mistakes. However, the submission of an ineligible action plan will not be prevented: this automation has limitations and some eligibility criteria cannot be expressed in a binary fashion. The 'Feedback Report' (sent by email by the JRC after 'human' analysis) is the only document that prevails in the end.

Submission

Before submitting your action plan in the Covenant online reporting platform, you will have to acknowledge that your SECAP template is well in line with the action plan document, the latter being officially approved by an appropriate decision-making body. To do so, tick the corresponding box next to the disclaimer.

The official submission of either your action plan or monitoring template takes place when you press the **'Submit'** button. A notification acknowledging the submission will appear on the screen.

Without submission, all the reported or uploaded data are simply saved in the Covenant extranet without being recognised as officially submitted. Thus, this leads you to fail in meeting your pre-defined submission deadlines.

After submission, **modifications are still possible** - if revisions are needed - before the plan's analysis by JRC starts. It means that it is the latest version available at the analysis stage which will be considered by the JRC for its analysis. However note that during the analysis of your action plan, the SECAP template will be **locked** and you cannot modify it during the analysis period.

ANNEX I – DEFAULT EMISSION FACTORS

This annex presents for each energy carrier a set of **default emission factors for CO_2 and for CO_2 equivalent** according to **IPCC** and **LCA** (Life cycle assessment) approaches. IPPC provides emission factors for fuel combustion which are based on the carbon content of each fuel (IPCC, 2006)[7]. LCA emission factors (JRC, 2009)[8] take into consideration the overall life cycle of each energy carrier, i.e. include not only the greenhouse gas emissions due to fuel combustion but also emissions of the entire energy supply chain – exploitation, transport, processing.

1. Emission factors for fossil fuel combustion

Energy carriers		IPCC		LCA	
SECAP Template	Standard denomination	t CO_2 /MWh	t CO_2 eq. /MWh	t CO_2 /MWh	t CO_2 eq. /MWh
Natural gas	Natural gas	0.202	0.202	0.221	0.237
Liquid gas	Liquefied Petroleum Gases	0.227	0.227	n.a.	n.a.
	Natural Gas Liquids	0.231	0.232	n.a.	n.a.
Heating Oil	Gas/Diesel oil	0.267	0.268	0.292	0.305
Diesel	Gas/Diesel oil	0.267	0.268[a)]	0.292	0.305
Gasoline	Motor gasoline	0.249	0.250[a)]	0.299	0.307
Lignite	Lignite	0.364	0.365	0.368	0.375
Coal	Anthracite	0.354	0.356	0.379	0.393
	Other Bituminous Coal	0.341	0.342	0.366	0.380
	Sub-Bitominous Coal	0.346	0.348	0.371	0.385
Other fossil fuels	Municipal waste (non-biomass fraction)	0.330	0.337	0.181	0.174
	Peat	0.382	0.383	0.386	0.392

[a)] If choosing to report in CO_2 eq, please consider that the emission factors for the transport sector are with up to 3% higher than the values provided here, which are characteristic for stationary sources.

[7] IPCC, 2006. Guidelines for National Greenhouse Gas Inventories. Prepared by the National Greenhouse Gas Inventories Programme. Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan. Available at : http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html

[8] JRC, 2009. European Reference Life Cycle Database (ELCD). LCA data sets of key energy carriers, materials, waste and transport services of European scope. Available at : http://lca.jrc.ec.europa.eu/lcainfohub/datasetArea.vm

2. Emission Factors for renewable energy sources

Energy carriers		Sustainability criteria [a]	IPCC		LCA	
SECAP template	Standard denomination		t CO_2 /MWh	t CO_2 eq. /MWh	t CO_2 /MWh	t CO_2 eq. /MWh
Plant oil	Other Liquid Biofuels	(s)	0	0.001	0.171	0.182
		(ns)	0.287	0.302		
Biofuel	Biogasoline	(s)	0	0.001	0.194	0.206
		(ns)	0.255	0.256		
	Biodiesels	(s)	0	0.001	0.147	0.156
		(ns)	0.255	0.256		
Other biomass	Biogas	-	0.197	0.197	n.a.	n.a.
	Municipal wastes (biomass fraction)	-	0	0.007	0.107	0.106
	Wood	(s)	0	0.007	0.006	0.013
		(ns)	0.403	0.410	0.409	0.416
	Wood waste	-	0.403	0.410	0.193	0.184
	Other primary solid biomass	-	0.360	0.367	n.a	n.a

[a] IPCC emission factor should be reported zero if the biofuels/biomass meet sustainability criteria (s); if biofuels/biomass do not meet sustainability criteria (ns) fossil fuel emission factors are instead used.

3. Emission factors for local renewable electricity production

	IPCC		LCA	
Technology	t CO_2 /MWh	t CO_2 eq. /MWh	t CO_2 /MWh	t CO_2 eq. /MWh
Wind power	0	0	n.a.	0.020-0.050[a]
Hydroelectric power	0	0	n.a.	0.007
Photovoltaics	0	0	n.a.	0.024[b]

[a] Based on results from one plant, operated in coastal areas with good wind conditions.

[b] Source: Vasilis *et al.*, 2008, Emissions from Photovoltaic Life Cycles, *Environmental Science & Technology*, Vol. 42, No. 6, p. 2168-2174.

4. Emission factors for electricity by country

Country	IPCC [t CO_2/MWh] * [a]					
	2005	2006	2007	2008	2009	2010
Austria	0.226	0.212	0.202	0.206	0.200	0.204
Belgium	0.288	0.274	0.279	0.269	0.315	0.298
Bulgaria	0.772	0.762	0.880	0.855	0.827	0.823
Croatia	0.328	0.324	0.383	0.333	0.286	0.306
Cyprus	0.875	0.884	0.879	0.868	0.864	0.869
Czech Republic	0.964	0.938	1.012	0.915	0.920	0.935
Denmark	0.411	0.556	0.462	0.426	0.450	0.455
Estonia	0.981	0.868	1.050	0.875	0.766	0.826
Finland	0.182	0.255	0.233	0.201	0.209	0.212
France	0.061	0.054	0.056	0.053	0.057	0.056
Germany	0.619	0.621	0.645	0.626	0.609	0.616
Greece	1.207	1.131	1.178	1.125	1.104	1.126
Hungary	0.563	0.551	0.606	0.593	0.516	0.539
Ireland	0.769	0.726	0.727	0.736	0.702	0.716
Italy	0.491	0.494	0.493	0.484	0.453	0.467
Latvia	0.093	0.121	0.104	0.110	0.117	0.113
Lithuania	0.185	0.144	0.143	0.132	0.161	0.157
Luxembourg	0.428	0.419	0.373	0.320	0.405	0.397
Malta	0.966	1.030	1.048	1.054	1.072	1.052
Netherlands	0.430	0.416	0.427	0.429	0.473	0.452
Poland	1.262	1.243	1.186	1.123	1.141	1.165
Portugal	0.440	0.377	0.339	0.336	0.353	0.361
Romania	0.683	0.741	0.730	0.700	0.652	0.675
Slovak Republic	0.282	0.271	0.241	0.237	0.230	0.240
Slovenia	0.536	0.536	0.539	0.561	0.613	0.582
Spain	0.497	0.451	0.455	0.418	0.378	0.405
Sweden	0.019	0.021	0.023	0.024	0.027	0.025
United Kingdom	0.531	0.554	0.559	0.551	0.521	0.531
EU-28	0.466	0.466	0.471	0.454	0.443	0.451

** When reporting in $CO_{2\,eq}$:*

- *the same emission factor should be used by signatories from: Latvia, Lithuania, France and Sweden*
- *0.001 tCO2eq/MWh should be added to the factors used by signatories from: Croatia, Slovak Republic and Luxembourg*
- *0.002 tCO2eq/MWh should be added to the factors used by signatories from: Austria, Belgium, Hungary, Ireland, Italy, Slovenia, and Spain*
- *0.003 tCO2eq/MWh should be added to the factors used by signatories from: Cyprus, Finland, Malta, Netherlands, Portugal, Romania and United Kingdom*
- *0.004 tCO2eq/MWh should be added to the factors used by signatories from: Bulgaria, Germany and Greece*
- *0.006 tCO2eq/MWh should be added to the factors used by signatories from: Czech Republic, Denmark, Estonia and Poland*

[b] Methodology for the calculation according to: UNFCCC, 2012 (Tool to calculate the emission factor for an electricity system). Sources for the calculation: data on national energy consumption and national energy production per energy carrier from International Energy Agency, 2010 Energy Statistics of OECD Countries; International Energy Agency, 2010 Energy Statistics of non-OECD Countries); data on carbon intensity of each type of fuel from IPCC, 2006 (Guidelines for National Greenhouse Gas Inventories, Chapter 2 – Stationary Combustion); data on efficiency of each carrier according to the technology of electricity production: European Life Cycle Database, 2013 (electricity emission inventories). Consistency checks have been performed comparing results with EDGARv4.2 and v4.2FT2010 for the CO_2 emissions from fuel combustion (cfr. Emissions Database for Global Atmospheric Research (EDGAR) http://edgar.jrc.ec.europa.eu/index.php see also Olivier and Janssens-Maenhout, 2011).

Country	LCA [t $CO_{2\ eq.}$/MWh] [b]					
	2005	2006	2007	2008	2009	2010
Austria	0.346	0.315	0.294	0.301	0.294	0.301
Belgium	0.418	0.390	0.395	0.373	0.434	0.417
Bulgaria	0.856	0.845	0.971	0.943	0.915	0.910
Croatia	0.537	0.527	0.608	0.534	0.475	0.502
Cyprus	1.020	1.030	1.025	1.010	1.008	1.014
Czech Republic	0.819	0.795	0.855	0.770	0.771	0.786
Denmark	0.673	0.929	0.763	0.699	0.737	0.748
Estonia	1.726	1.528	1.849	1.540	1.322	1.434
Finland	0.345	0.499	0.457	0.383	0.406	0.412
France	0.157	0.141	0.146	0.139	0.148	0.147
Germany	0.709	0.707	0.729	0.707	0.678	0.692
Greece	1.223	1.152	1.195	1.143	1.122	1.144
Hungary	0.675	0.670	0.735	0.711	0.599	0.634
Ireland	0.908	0.862	0.865	0.877	0.838	0.854
Italy	0.721	0.725	0.723	0.710	0.661	0.683
Latvia	0.504	0.608	0.529	0.564	0.610	0.584
Lithuania	0.212	0.165	0.163	0.150	0.180	0.177
Luxembourg	0.699	0.682	0.604	0.514	0.652	0.641
Malta	1.565	1.669	1.697	1.707	1.737	1.705
Netherlands	0.705	0.682	0.709	0.708	0.776	0.743
Poland	1.262	1.241	1.182	1.115	1.125	1.153
Portugal	0.887	0.769	0.690	0.684	0.720	0.734
Romania	1.064	1.146	1.123	1.079	1.008	1.043
Slovak Republic	0.406	0.379	0.335	0.327	0.318	0.334
Slovenia	0.580	0.581	0.582	0.600	0.668	0.631
Spain	0.716	0.652	0.659	0.611	0.557	0.593
Sweden	0.074	0.075	0.076	0.082	0.087	0.083
United Kingdom	0.642	0.669	0.678	0.670	0.631	0.644
EU-28	0.588	0.587	0.592	0.571	0.553	0.565

[c] Source for LCA emission factors: the European Reference Life Cycle Database (ELCD) has been used as primary source of life cycle emissions related to the different technologies of electricity production http://lca.jrc.ec.europa.eu/lcainfohub/datasetArea.vm (year 2002). Data on national electricity production from different energetic vector is acquired from International Energy Agency, 2010 (Energy statistics of OECD Countries).

IMPORTANT: Regular updates of the default values are foreseen. Please check for the latest version in the Covenant website Library.

ANNEX II – CATEGORISATION OF THE ACTIONS

- **Areas of intervention**

A1	Municipal, Residential, Tertiary buildings, equipment/facilities	Examples of actions
A11	Building envelope	Thermal insulation of walls, windows, roofs; external shading.
A12	Renewable energy for space heating and hot water	Installation of thermal solar panels for hot water.
A13	Energy efficiency in space heating and hot water	Tax deduction for the replacement of old boilers with condensing boilers.
A14	Energy efficient lighting systems	Adhesion of 20 SMEs to the European Commission's GreenLight Programme.
A15	Energy efficient electrical appliances	Incentives for the replacement of domestic appliances for new ones.
A16	Integrated action (all above)	Retrofitting of residential buildings, bundling together technology improvements and insulation measures.
A17	Information and Communication Technologies	Deployment of smart meters in households; installation of Building Energy Management Systems (BEMs) in commercial buildings.
A18	Behavioural changes	Demand Response programmes.
A19	Other	-
A2	**Public lighting**	
A21	Energy efficiency	Replacing light bulbs and luminaries by efficient ones.
A23	Integrated renewable power	Installation of renewable energy powered street lighting and traffic lights systems.
A24	Information and Communication Technologies	Optimal regulation of light intensity in response to changing environmental conditions.
A25	Other	-
A3	**Industry**	
A31	Energy efficiency in industrial processes	Replacement to more efficient boilers or CHP for process heating, replacement of motors, etc.
A32	Energy efficiency in buildings	Ventilation with heat recovery.
A33	Renewable energy	Use of solar cooling for industrial processes.
A34	Information and Communication Technologies	Installation of Building Energy Management Systems (BEMs).
A35	Other	-
A4	**Transport**	
A41	Cleaner/efficient vehicles	Reduced taxes for low emissions vehicles.
A42	Electric vehicles (incl. infrastructure)	Introduction of charging infrastructure.
A43	Modal shift to public transport	Improvement of the public transport infrastructure; Intermodal improvement; Park & Ride.
A44	Modal shift to walking & cycling	Improvement of the walking & cycling infrastructure.
A45	Car sharing/pooling	Introduction of car sharing or car pooling schemes.
A46	Improvement of logistics and urban freight transport	Improvement of rail links with ports.
A47	Road network optimisation[9]	Construction of roundabouts in order to reduce congestion.
A48	Mixed use development and sprawl containment	Implementation of policies to contain urban sprawl in new developments.

[9] Note that according to several studies, measures in this area might induce extra traffic and subsequently increase emissions.

A49	Information and Communication Technologies	Teleworking; traffic management; digital signage.
A410	Eco-driving	Education and training of drivers to adopt a fuel-efficient driving style.
A411	Other	-
A5	**Local electricity production**	
A51	Hydroelectric power	Development of a small-scale hydropower plant.
A52	Wind power	Installation of 30 domestic wind turbines.
A53	Photovoltaics	Building-integrated photovoltaics.
A54	Biomass power plant	Construction of a woody biomass power plant (1 MW thermal energy input).
A55	Combined Heat and Power	Construction of a natural gas CHP plant to cover the needs of the local hospital (15 MW thermal energy input).
A56	Smart grids	Implementation of smart grids or smart grids demonstration projects.
A57	Other	-
A6	**Local heat/cold production**	
A61	Combined Heat and Power	Construction of a biomass CHP plant to supply district heating/cooling.
A62	District heating/cooling plant	Construction of the waste to energy facility to supply district heating.
A63	District heating/cooling network (new, expansion, refurbishment)	Renovation of the existing district heating network.
A64	Other	-
A7	**Other**	
A71	Urban regeneration	Redevelopment of de-industrialised areas, according to sustainable energy criteria.
A72	Waste & wastewater management	Zero waste campaign.
A73	Tree planting in urban areas	Campaign one tree for every new-born.
A74	Agriculture and forestry related	Use of more efficient agricultural machinery.
A75	Other	-

- **Policy instruments**

B1	**Buildings**	
B11	Awareness raising / training	Campaign to encourage the installation of thermostatic valves.
B12	Energy management	Adoption of an Energy Management System for municipal properties.
B13	Energy certification / labelling	Display energy certificates on municipal buildings.
B14	Energy suppliers obligations	Distribution of low-flow shower heads and faucet aerators to citizens by the energy supplier.
B15	Energy / carbon taxes	Imposing higher taxes on fuels depending on their carbon content.
B16	Grants and subsidies	Tax credits for the replacement of boilers by more efficient ones.
B17	Third party financing. PPP	Retrofit of social housing through an ESCo system by Third Party Financing (TPF).
B18	Public procurement	Energy efficiency criteria for the purchase of electrical appliances.
B19	Building standards	Replacement of single glazed windows with low-E double glazing for retrofitted buildings under municipal buildings regulation.
B110	Land use planning regulation	Construction of new residential areas in proximity of a district heating network.
B111	Not applicable	-
B112	Other	-
B2	**Public Lighting**	
B21	Energy management	Implementation of an energy monitoring system for street lighting.
B22	Energy suppliers obligations	Street lighting refurbishment by the energy supplier.
B23	Third party financing. PPP	ESCo mechanism by TPF or Public Private Partnerships (PPP) for the replacement of traffic lights.
B24	Public procurement	Introduction of energy efficiency requirements for street lighting.
B25	Not applicable	-
B26	Other	-

B3	**Industry**	
B31	Awareness raising / training	Publication of best practices for industries.
B32	Energy management	Energy audits.
B33	Energy certification / labelling	Introduction of energy certification of industrial buildings.
B34	Energy performance standards	More efficient use and regulation of waste heat.
B35	Energy / carbon taxes	Tax reduction for companies which invest in energy efficiency measures.
B36	Grants and subsidies	Financial incentives for rational energy use.
B37	Third party financing. PPP	Involvement of an Energy Service Company (ESCo) by TPF for improving the efficiency of compressed air systems.
B38	Not applicable	-
B39	Other	Eco-industrial parks.
B4	**Transport**	
B41	Awareness raising/training	Information campaign to facilitate optimal tyre pressure check. Promotion of sustainable transport.
B42	Integrated ticketing and charging	Introduction of integrated tariff system, allowing people to use several transport modes with a single ticket.
B43	Grants and subsidies	Municipal incentives for purchasing electric bicycles.
B44	Road pricing	Congestion charge.
B45	Land use planning regulation	Policy to limit parking provision near dwellings.
B46	Transport / mobility planning regulation	Introduction of freight traffic limitations in the centre; speed limitation.
B47	Public procurement	Introduction of energy efficiency requirements for bus or municipal vehicles.
B48	Voluntary agreements with stakeholders	Multi-operator ticketing.
B49	Not applicable	-
B410	Other	-

B5	**Local Electricity Production**	
B51	Awareness raising / training	Education campaign on the installation of wind micro-turbines.
B52	Energy suppliers obligations	Installation of PV plants by the energy supplier.
B53	Grants and subsidies	Contribution to citizens for the purchase of wind micro turbines.
B54	Third party financing. PPP	Establishment of a private-public partnership between the local authority (51%) and a private company (49%) for the construction of a CHP plant.
B55	Building standards	New buildings should have PV panels for 25% of roof area.
B56	Land use planning	Identification of areas where the installation of power plants is encouraged (e.g. old industrial areas). Planning of new districts having into account the renewable energy potential.
B57	Not applicable	-
B58	Other	-
B6	**Local heat/cold Production**	
B61	Awareness raising / training	Training courses for the construction sector on how to integrate local heat production in new buildings.
B62	Energy suppliers obligations	Installation of district heating systems under energy suppliers obligations.
B63	Grants and subsidies	Subsidies for condominiums connected to a district heating network.
B64	Third party financing. PPP	Development of an ESCo project by TPP to build a small scale district heating system.
B65	Building standards	New buildings should be set up for the connection to a district heating network.
B66	Land use planning regulation	New residential area next to a district heating network.
B67	Not applicable	-
B68	Other	-
B7	**Other**	
B71	Awareness raising / training	Promote awareness of climate change mitigation and adaptation through work-shops and publications.
B72	Land use planning	Urban expansion areas should always foresee a minimum green surface area.
B73	Not applicable	-
B74	Other	-

ANNEX III – EXAMPLES OF INDICATORS FOR MITIGATION

You can find below some examples of indicators that could be used by your local authority to monitor progress (the lists are non exhaustive):

- **Examples of indicators & required parameters that are not included in the template**

Indicators	Parameters required
GHG emissions per unit of Gross Domestic Product (GDP) [t CO_2 or t CO_2 eq./ million €]	Municipal GDP
Energy intensity of buildings [kWh/m^2]	Square meters of building floor area
Carbon intensity of transport [CO_2/km]	km driven by transport category
Public transport ridership [pkm/capita]	Passenger-km in public transport
Energy expenditure in the municipal sector [€/year]	Municipal energy expenditure
Energy expenditure in the residential sector [€/year]	Residential end-use energy price per energy carrier
Share of household income spent on fuel and electricity [%]	Annual household energy expenditure; Average household income
Share of population without access to electricity or commercial energy [%]	Number of population without access to electricity or commercial energy
Access to public transport [number]	Number of people within 0.5 km of public transit
Primary energy use per capita [MWh/capita]	Primary energy consumption
Emissions of air pollutants from road transport [µg/m3 or mg/m3]	Emissions of nitrogen oxides (NOx), Sulphur oxides (SOx), fine particulates, carbon monoxide (CO).

- **Examples of progress-based indicators for each 'area of intervention'**

Area of intervention	Indicator
Municipal - Residential - Tertiary Buildings	
Building envelope	Number/surface area of buildings insulated [-/m2]
Energy efficiency in space heating and hot water	Number of boilers replaced [-]
Energy efficient lighting systems	Number of lamps replaced [-]
Energy efficient electrical appliances	Number of electrical appliances replaced [-]
Renewable energy for space heating and hot water	Surface area of solar thermal panels installed [m2]
Integrated action	Number/surface area of buildings retrofitted [-/m2]
ICT	Number of buildings with smart meters installed [-] / Number of new buildings with domotic systems [-]
Behavioural changes	Number of participants in awareness raising campaigns [-] / Number of CFLs distributed [-]
Public Lighting	
Energy efficiency	Number of conventional traffic lights replaced by LED [-]
Integrated renewable power	Renewable power installed (kW)
ICT	Number of remote control systems installed [-]

Industry	
Energy efficiency in industrial processes	Number of boilers replaced [-]
Energy efficiency in buildings	Number of lamps replaced [-]
Renewable energy	Renewable power installed (kW)
Municipal - Public - Private Transport	
Cleaner/efficient municipal vehicles	Number of vehicles replaced [-]
Municipal fleet - efficient driving behaviour	Example: no. of courses given on total planned (%)
Cleaner/efficient public transport	Number of new CNG buses purchased [-]
Public transport infrastructure, routes and frequency	Network extension (km) / Number of services per day [-]
Electric vehicles infrastructure	Number of charging points [-]
Car sharing	Number of car share vehicles and locations [-]
Walking &cycling	Number of bicycle parking spaces [-]
ICT	Number of roads with Variable Speed Limits (VSB) introduced [-] / Number of teleworking schemes in place [-]
Efficient driving behaviour	Example: no. of courses/campaigns realised on total planned (%)
Local Electricity Production	
Hydroelectric power	Power installed [MW]
Wind power	Power installed [MW]
Photovoltaics	Power installed [MW]
Biomass power	Power installed [MW]
Combined Heat and Power	Power installed [MW]
Local heat/cold Production	
District heating/cooling network (new, expansion, refurbishment)	Network extension [km] / Number of customers [-]
Combined Heat and Power	Capacity installed [MW]
Other	
Waste management	Amount of waste recycled [tonnes]/Urban waste subject to separate collection (%)
Wastewater management	Number of water pumps replaced [-]
Tree planting in urban areas	Net tree gain [-]
Agriculture and forestry related	Number of farm machinery replaced [-] / Number of pumps replaced for irrigation [-]

ANNEX IV – EXAMPLE OF INDICATORS FOR ADAPTATION

The indicators provided in this serve as a source of inspiration. It provides vulnerability, impact and outcome indicators. None of these indicators listed below are compulsory, but are rather illustrative examples. Note that the indicators are classified according to the different sectors and categories you can found in the previous tabs of this present template. You will also find a list of indicator examples (non-exhaustive). You can select any indicators that your local authority is using to measure progress and complete the list with your own - simply add / hide the rows according to your needs.

- **Vulnerability-related indicators**

Vulnerability Type	Vulnerability-related indicators	Unit
Climatic	Number of days/nights with extreme temperature (compared to ref. annual/seasonal temperatures at day/night times)	Number of days/nights
Climatic	Frequency of heat/cold waves	Average per monthly/year
Climatic	Number of days/nights with extreme precipitation (compared to ref. annual/seasonal precipitation at day/night times for each season)	Number of days/nights
Climatic	Number of consecutive days/nights without rainfall	Number of days/nights
Socio-economic	Current population vs. projections 2020/2030/2050	Number of inhabitants
Socio-economic	Population density (compared to national/regional average in year X in country/region X)	People per km^2
Socio-economic	% share of sensitive population groups (e.g. elderly (65+)/young (25-) people, lonely pensioner households, low-income/unemployed households) - compared to national average in year X in country X	%
Socio-economic	% of population living in areas at risk (e.g. flood/drought/heat wave/ forest or land fire)	%
Socio-economic	% of areas non-accessible for emergency / fire-fighting services	%
Physical & environmental	% change in average annual/monthly temperature	%
Physical & environmental	% change in average annual/monthly precipitation	%
Physical & environmental	Length of transport network (e.g. road/rail) located in areas at risk (e.g. flood/drought/heat wave/ forest or land fire)	km
Physical & environmental	Length of coastline / river(s) affected by extreme weather conditions / soil erosion (without adaptation)	km
Physical & environmental	% of low-lying or at altitude areas	%
Physical & environmental	% of areas at coasts or rivers	%
Physical & environmental	% of protected (ecologically and/or culturally sensitive) areas / % of forest cover	%
Physical & environmental	% of (e.g. residential/commercial/agricultural/industrial/touristic) areas at risk (e.g. flood/drought/heat wave/ forest or land fire)	%
Physical & environmental	Current energy consumption per capita vs. projections 2020/2030/2050	MWh
Physical & environmental	Current water consumption per capita vs. projections 2020/2030/2050	m3
Other [please specify]	Other [please specify]	[please specify]

- **Impact-related indicators**

Impacted Sector(s)	Impact-related indicators	Unit
Buildings	Number or % of (public/residential/tertiary) buildings damaged by extreme weather conditions/events	(per year / over a certain period)
Transport, Energy, Water, Waste, ICT	Number or % of transport/energy/water/waste/ICT infrastructure damaged by extreme weather conditions/events	(per year / over a certain period)
Land Use Planning	% of grey/blue/green areas affected by extreme weather conditions/events (e.g. Heat Island Effect, Flood, Rockfalls and/or Landslides, Forest/Land Fire)	%
Transport, Energy, Water, Waste, Civil Protection & Emergency	Number of days with public service interruptions (e.g. energy/water supply, health/civil protection/emergency services, waste)	-
Transport, Energy, Water, Waste, Civil Protection & Emergency	Average length (in hours) of the public service interruptions (e.g. energy/water supply, public transport traffic, health/civil protection/emergency services)	hours
Health	Number of people injured/evacuated/relocated due to extreme weather event(s) (e.g. heat or cold waves)	(per year / over a certain period)
Health	Number of deaths related to extreme weather event(s) (e.g. heat or cold waves)	(per year / over a certain period)
Civil Protection & Emergency	Average response time (in min.) for police/fire-fighters/emergency services in case of extreme weather events	min.
Health	Number of water quality warnings issued	%
Health	Number of air quality warnings issued	
Environment & Biodiversity	% of areas affected by soil erosion / soil quality degradation	%
Environment & Biodiversity	% of habitat losses from extreme weather event(s)	%
Environment & Biodiversity	% change in number of native species	%
Environment & Biodiversity	% of native (animal/plant) species affected by diseases related to extreme weather conditions/events	%
Agriculture & Forestry	% of agriculture losses from extreme weather conditions/events (e.g. drought/water scarcity, soil erosion)	%
Agriculture & Forestry	% of livestock losses from extreme weather conditions	%
Agriculture & Forestry	% change in crop yield / evolution of the annual grassland productivity	%
Agriculture & Forestry	% of livestock losses from pests/pathogens	%
Agriculture & Forestry	% of timber losses from pests/pathogens	%
Agriculture & Forestry	% change in Forest composition	%
Agriculture & Forestry	% change in water abstraction	%
Tourism	% change in tourist flows / tourism activities	%
Other	€ annual direct economic losses (e.g. in commercial/agricultural/industrial/touristic sectors) due to extreme weather event(s)	€/year
Other	€ annual amount of compensation received (e.g. insurance)	€/year

- **Outcome-related indicators**

Concerned Sector(s)	Outcome-related indicators	Unit
Buildings	% of (public/residential/tertiary) buildings retrofitted for adaptive resilience	%
Transport, Energy, Water, Waste, ICT	% of transport/energy/water/waste/ICT infrastructure retrofitted for adaptive resilience	%
Land Use Planning	% change in green & blue infrastructure/areas (surface)	%
Land Use Planning	% change in connected green and blue areas	%
Land Use Planning	% change in sealed surfaces / soil moisture level	%
Land Use Planning	% change in runoff of rainwater overflows (due to change in soil infiltration)	%
Land Use Planning	% change in shading (& related change in the Urban Heat Island effect)	%
Land Use Planning	% of coastline designated for managed realignment	%
Water	% change in water loss (e.g. due to leakage in the water distribution system)	%
Water	% change in storage of rain water (for reuse)	%
Waste	% change in solid waste collected / recycled / disposed of / burned	%
Environment & Diversity	% of habitats restored / % of species protected	%
Agriculture & Forestry	% change in crop yield due to adaptation measures	%
Agriculture & Forestry	% change in water consumption for agriculture/irrigation	%
Agriculture & Forestry	% of forest restored	%
Tourism	% change in tourist flows	%
Tourism	% change in tourism activities	%
Other	% change in costs for recovery and reconstruction associated with extreme climate events	%
Other	€ investment in adaptation research (e.g. soil conservation, water/energy efficiency…) by the city / by other stakeholders	€
Other	€ investment in education / in health & emergency systems by the city	€
Other	Number of awareness-raising events targeting citizens and local stakeholders	-
Other	Number of training sessions targeting staff	-
Other	Number of direct beneficiaries involved in adaptation process milestone decision making through community participatory activities	-

ANNEX V – GLOSSARY OF KEY ADAPTATION TERMS

- **Key Adaptation Terms**

Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation.
Hazard	The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources. In this template, the term hazard usually refers to climate-related physical events or trends or their physical impacts.
Exposure	The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets present in hazard zones that are thereby subject to potential losses.
Sensitivity	Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate variability or change.
Vulnerability	Degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.
Impact	Impacts generally refer to potential effects (without adaptation) on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate change or hazardous climate events occurring within a specific time period. Impacts are also referred to as consequences.
Risk	The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard. The term risk is used primarily to refer to the risks of climate-change impacts in the present template.

- **Climate Hazards**

Flood	The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas that are not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods, and glacial lake outburst floods.
Drought	A period of abnormally dry weather long enough to cause a serious hydrological imbalance.
Storm	An atmospheric disturbance that can be manifested in strong winds and accompanied by rain, snow, or other precipitation and by thunder and lightning.

- **Adaptation Process**

Risk & Vulnerability Assessment(s) (RVA(s))	Determines the nature and extent of risk by analysing potential hazards and assessing vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend – it allows the identification of areas of critical concern and therefore provides information for decision-making. This can take the form of one assessment, or several assessments undertaken reflecting different local priorities. They can include different types of assessments (for example, institutional risk assessments, hazard assessments, retrospective vulnerability assessments in the case of extreme weather events).
Adaptation Strategy	Outlines the vision of the local authority for a more climate resilient future; Specifies the priority areas of action as well as the mechanisms for stakeholder Involvement, funding and resource mobilisation, continuous monitoring and review.
Adaptation Action Plan	Defines a set of concrete adaptation actions, together with time frames and assigned responsibilities, which translate the long-term strategy into action.
Adaptation Actions (or measures)	Technologies, processes, and activities directed at enhancing our capacity to adapt (building adaptive capacity) and at minimising, adjusting to and taking advantage of the consequences of climatic change (delivering adaptation).
Adaptation Option Assessment	The practice of identifying options to adapt to climate change and evaluating them in terms of criteria such as availability, benefits, costs, effectiveness, efficiency and feasibility.
Mainstreaming	Mainstreaming adaptation into policy processes focuses on integrating adaptation issues into other ongoing (sectoral) policy processes.
Evaluation	A process for systematically and objectively determining the effectiveness of an adaptation measure in the light of its objectives.

- **Sectors**

Buildings	Refers to any (municipal/residential/tertiary, public/private) structure or groups of structures, surrounding spaces, permanently constructed or erected on its site.
Transport	Includes road, rail, air and water transport networks and related infrastructure (e.g. roads, bridges, hubs, tunnels, ports and airports). It comprises an extensive range of both public and private assets and services and excludes all related vessels, vehicles (and related parts and processes).
Energy	Refers to the energy supply service and related infrastructure (generation, transmission & distribution networks, all energy types). It includes coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity and heat.
Water	Refers to the water supply service and related infrastructure. It also covers water use (e.g. by households, industry, energy production, agriculture, etc.) and (waste-, rain-) water management system, that includes sewers, drainage and treatment systems (i.e. the process to render waste water fit to meet environmental standards or other quality norms, as well as to cope with excess rain or storm water).
Waste	Includes activities related to the management (including collection, treatment and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites.

Land Use Planning	Process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans or regulations that describe the permitted or acceptable uses.
Agriculture & Forestry	Includes land classified / designated for agriculture & forestry use, as well as organisations and industries linked to creation and production within and surrounding the boundaries of the municipality. It includes animal husbandry, aquaculture, agroforestry, beekeeping, horticulture and other agriculture & forestry management and services in the area.
Environment & Biodiversity	Environment refers to green and blue landscapes, air quality, including urban hinterland; Biodiversity refers to the variety of life in a specific region, measurable as the variety within species, between species, and the variety of ecosystems.
Health	Refers to the geographical distribution of dominance of pathologies (allergies, cancers, respiratory and heart diseases, etc.), information indicating the effect on health (biomarkers, decline of fertility, epidemics) or well-being of humans (fatigue, stress, post-traumatic stress disorder, death etc.) linked directly (air pollution, heat waves, droughts, severe flood events, ground level ozone , noise, etc.) or indirectly (food / water quality and availability, genetically modified organisms, etc.) to the quality of the environment. It also includes the health care service and related infrastructure (e.g. hospitals).
Civil Protection and Emergency	Refers to the operation of the civil protection and emergency services by or on behalf of public authorities (e.g. civil protection authorities, police, fire-fighters, ambulance, paramedic and emergency medicine services) and includes local disaster risk reduction and management (i.e. capacity building, coordination, equipment, emergency planning etc.).
Tourism	Refers to the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited.
Other	Any other sectors (e.g. Information and Communication Technologies (ICT), Industry, Financial)

- **Sources**

OECD Glossary of Statistic Terms

EUROSTAT Reference and Management of Nomenclatures

INSPIRE Glossary

- **More definitions**

IPCC Glossary of Terms (2012)

Climate-Adapt Online Glossary