carbonn Climate Registry User Manual

(V3.0)

Table of content

Welcome to our carbon Climate Registry user manual, brought to you by ICLEI's Bonn Center for Local Climate Action and Reporting.

This manual contains the technical demonstration materials necessary to support local and regional governments reporting to the carbon*n* Climate Registry (cCR). It is structured according to the structure of the offline reporting sheets, **version 3.1 and action sheet version 1.3**

If you have any question, please feel free to contact your carbonn team via carbonn@iclei.org. We will be happy to provide individual assistance to your special requests.

What is the carbon*n* Climate Registry and why should I report it?

We know that tackling climate change is no easy task. It is even more difficult to implement effective solutions without knowing exactly where you stand and where you need to go. This is why we created the carbonn Climate Registry (cCR) and are continuously working to improve the Registry based on valuable feedback from ICLEI Members.

The carbon*n* Climate Registry (cCR) was launched at the World Mayors Summit on Climate in Mexico City on 21 November 2010, as the global response of local governments to measurable, reportable and verifiable climate action.

Operated by carbon*n* Center, the cCR has become the world´s leading reporting platform to enhance transparency, accountability, and credibility of local and subnational climate action in 6 years.

The cCR gives you a framework for structuring your information and will guide you in building a complete climate action profile. It helps you to set strategic and ambitious climate targets, act on your priorities and track your progress along the way. The end result is an informed data-driven climate action pathway for your local government and community.

The cCR is a place for you to prove your climate leadership on a global stage. You can simultaneously link to over 15 initiatives that multiply your opportunities for visibility, peer-to-peer comparison, financial support and technical assistance in climate change mitigation, adaptation, and sectors such as air quality, energy and water.

By reporting to the cCR, you will join the ranks of cities, towns, and regions demonstrating good governance by sharing transparent, accountable and credible information.

We invite you to register today and experience the platform and its new features. First time reporting can be as easy as registering your council-approved climate target or climate adaptation action.

Who can report, and when can a city or region report?

The cCR is a cost-free service for the use of any **local AND subnational government** (region, province, state). It means you do not need to be ICLEI member nor are you required to participate in any initiative to use the carbonn climate registry. Our platform is here to support your local leadership, transparency, and accountability, 365 days a year.

Your report is welcomed at any time. However, we encourage local government updating data biannually - in mid-May and by mid-October. We will aggregate and analyze data from your timely report **to feed local and subnational governments' ambitious climate leadership into global climate advocacy processes, such as the UNFCCC international climate negotiations for example at the Conference of Parties**. The analysis, in turn, demonstrates your power and potential to address climate change, and mitigate risk. Your city profile highlights the contribution to the national government 's climate goals in Measurable, Reportable, and Verifiable ways.

We are looking forward to receiving your reports and thank you in advance for your leadership!

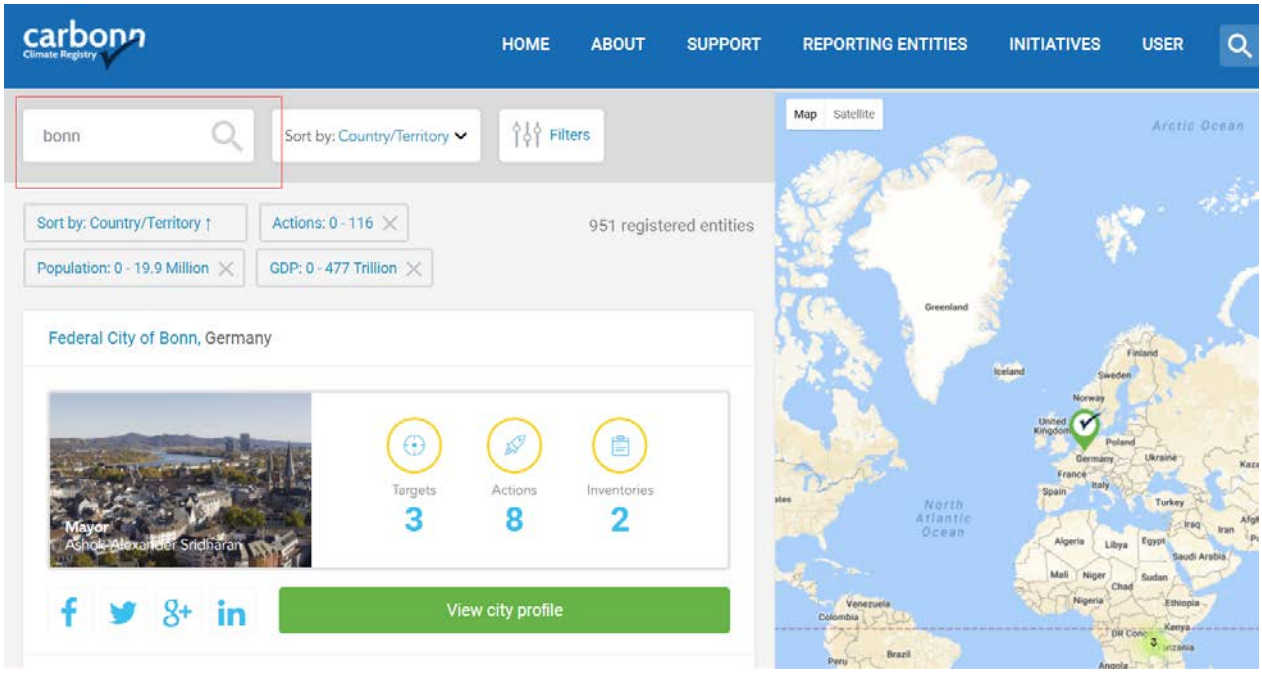
How to register as a new user? (Watch the tutorial video)

Registration is only open to government staff for reporting purposes. Private and academic institutions cannot register for a reporting account. But we are welcome you to explore news, reports and guidance videos freely on the website, without registration.

Staff members of local or regional governments, please visit out website at: carbonn.org

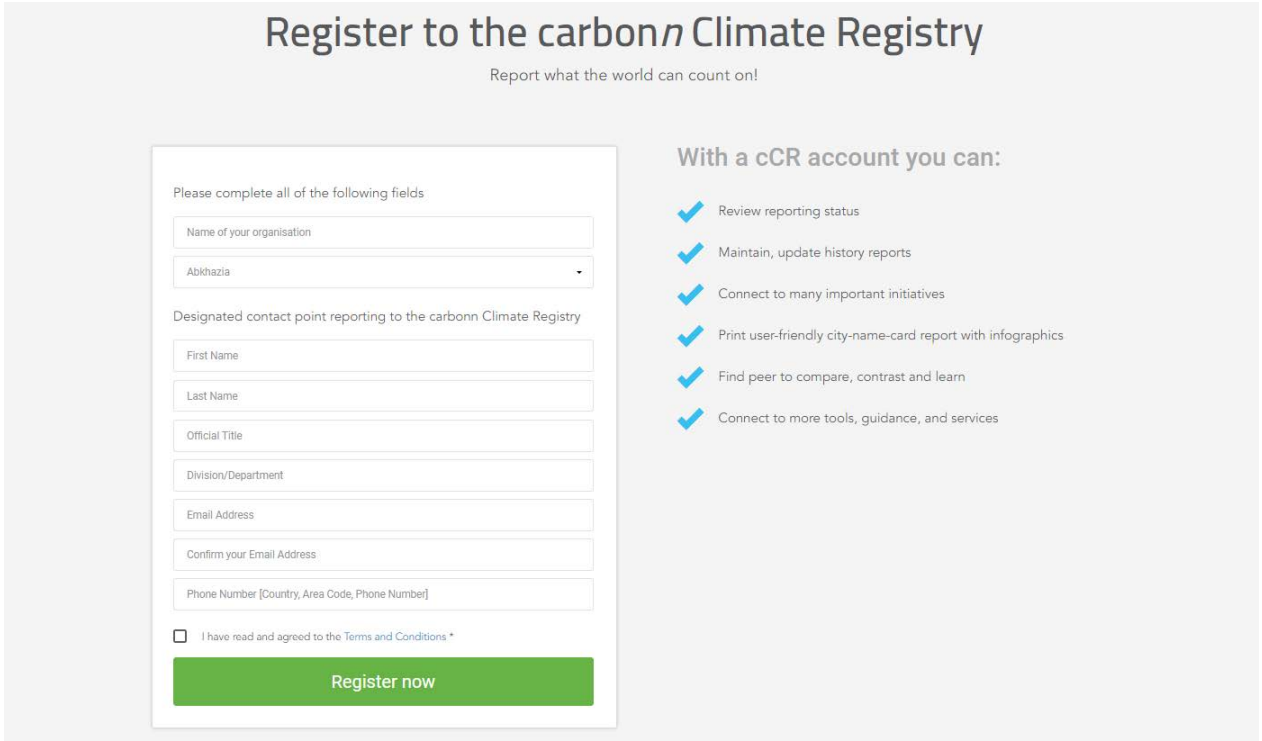
Before initiating a registration request, please check if your government has already setup an account on "The Entity page" by typing in the name of your local government in the search bar and enter. See the picture below:

- If your name does not appear in the searching result, click "participate".
- if your entity exists, but you forget the login details, please write an email to carbonn@iclei.org, including the name of your government.



To initiate a new cCR account, you simply need to complete a short registration form on the [register page,](#) (see the picture below). It includes the name of your local government, the host country (chose a country name from the dropdown list), and the contact info of the responsible person. Do not forget to confirm your email address and finally the telephone number with your country code.

Please read and confirm the terms and conditions document, before clicking the “register now” button for confirmation



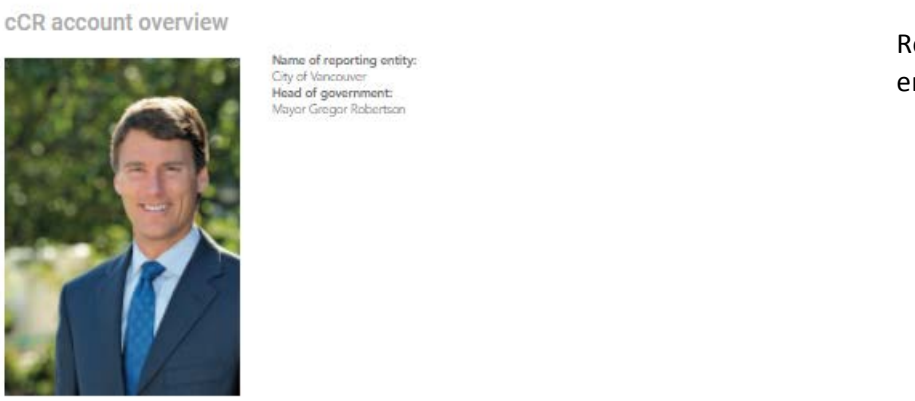
After receiving your registration request, the carbonn Center will process your information. We will initiate your account and send you the login password once your information is verified.

When to log in to my account?

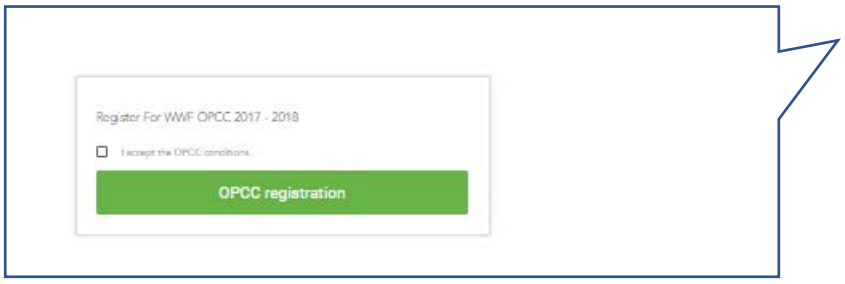
If you do not have an account, and need to create one, please read the "registration and reporting for new users "section for a step by step guide on "how to create an account".

Logging in enables you to:

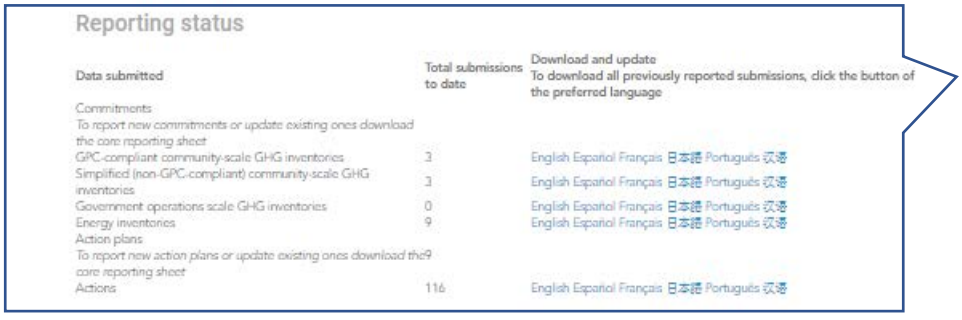
- Download and upload reporting sheet in various languages
- Review and update entity profile
- Access various training materials



Review and update the entity profile



Participate initiatives



Review and update reports

Start new reports

What should I do if I forget my username or password?

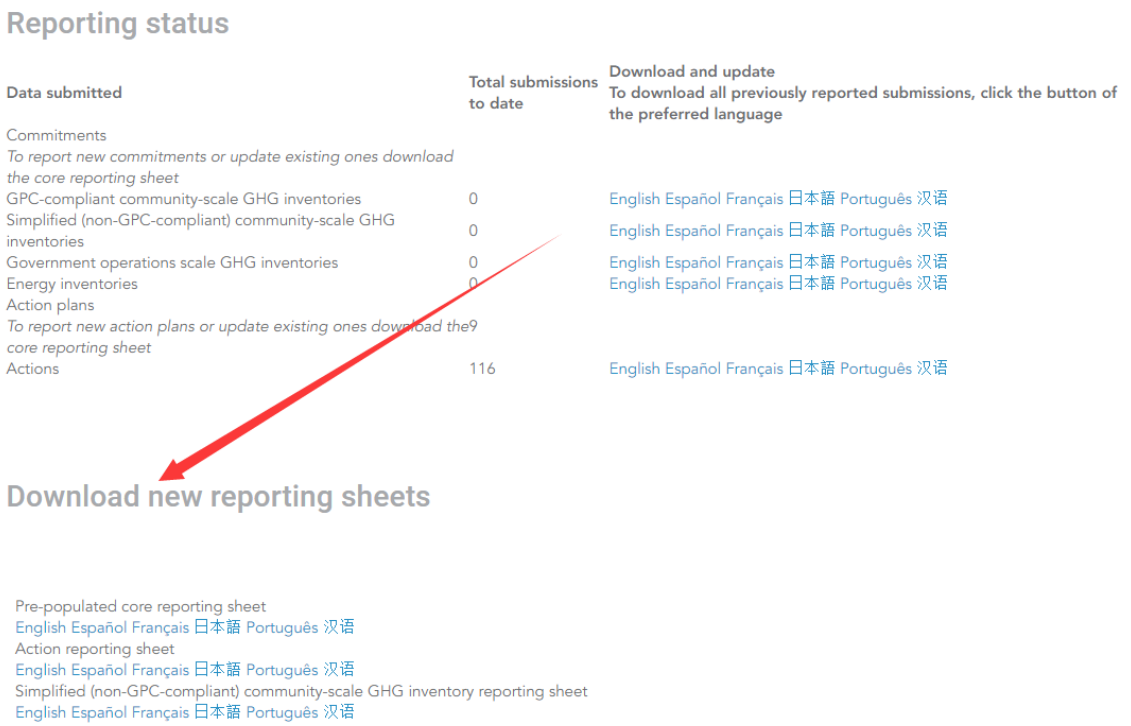
Please send us an account re-set request to carbonn@iclei.org with an official email account. We will reset the log-in detail for you.

What should I do if I wish to change the username email address?

If the contact person in your city government has changed and you need to update the username email address, please right us an account re-set request to carbonn@iclei.org with an official email account. We will reset the log-in detail for you.

How to download reporting sheet(s) and start reporting? (Watch the tutorial video)

You can start to report and review entity profile by loggingin to our platform. Please read the "how to login to my account" section if you need guidance.

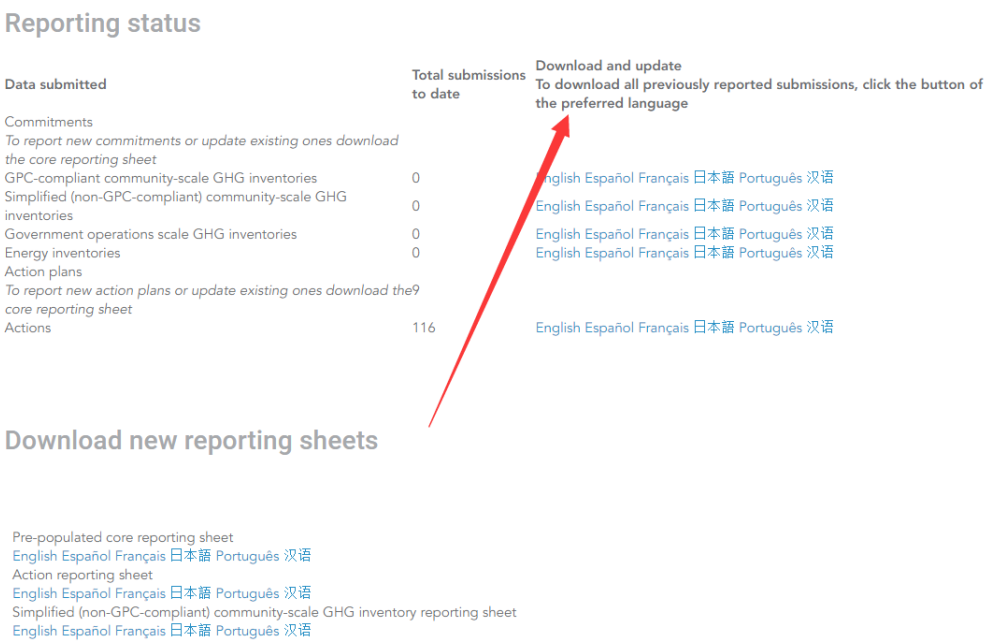


You can initiate **new reports** by downloading an empty reporting sheet that includes only your profile information, such as city name, geographic location, pre-populated, in your preferred language by clicking on the language name.

Send us the reporting sheet with your **New Reports** to the carbonn@iclei.org. We will create a new report entry for you.

How to review and update a previous report?

You can download the pre-populated reporting sheets containing your previous reports by by loggingin to our platform. Please read the "how to login to my account" section if you need guidance.



You can review and update your **historical** reports by downloading prepopulated sheets with your preferred language, by clicking on the language name.

Send us the reporting sheet with your **updates** to the carbonn@iclei.org. We will overwrite your old report with the new updates

What should I report? (Watch the tutorial video)

The standard cCR reporting **consists three segments**: the **core sheet**, the **action sheet,** and the **simplified community inventory reporting sheet**. You can download them by logging in to your account.

The action sheet is where you report individual actions. It can be the development of infrastructures (such as a power plant) or the establishment of a climate policy.

The simplified community inventory sheet provides a simple version to report GHG emissions from a local or regional government. It is only a substitute when you do not have the capacity to apply GPC-standard. Many initiatives, such as the Compact of Mayors and the One Planet City Challenge require the use of GPC standards, which is only available in the core sheet**. If you already reported a community inventory in the core sheet, do not duplicate the report here.**

The main information is collected in the core sheet. It includes

1. **Account Info**: collects identification information of the reporting entity.

2**. Profile**: A sustainability profile is built on the geopolitical, economic and environment data in this section. We recommend that the reporting entity updates the profile information regularly. Your profile serves as a valid benchmark for assessing your targets, action plans, and sustainability performances.

3. **Target& commitments:** In this section, the reporting entity announces quantifiable targets to address mitigation and adaptation.

4. **Action Plan**: In this section, the reporting government provides a brief overview of its sustainable action plan. Individual actions should be reported in the separated “Action Sheet”.

An action plan includes more than one action. The action is an individual activity that is implementable to realize the action plan. For example, to reach carbon neutrality is an action plan. While building renewable energy power plants, purchasing carbon credit to offset emissions are two individual actions within this action plan.

5. GHG Inventory -GPC: It is the place reporting government tracks the GHG inventory within its geographic boundary, according to the requirement of GPC (Global Protocol for Community-Scale Greenhouse Gas Emissions). If you face difficulty filling in the inventory according to GPC. You may download the simplified version**.**

6. Energy performance: It is the place reporting entity tracks energy generation and consumption performance
7. GHG Inventory-Government: It is the place reporting government tracks the GHG inventory of government operation.
8. **Adaptation & Resilience:** It is the place to report climate hazards and impacts, risk and vulnerability assessment, and adaptation planning and implementation as part of their compliance with the Compact of Mayors.
9. "Mobility data" sheet: It tracks the activities that count towards eco-mobility.

Each initiative may have special reporting requirements. You can find them on carbonn.org/initiative.

The **basic requirement** to become a cCR reporting entity is to complete **at least the profile sheet** and **submit one action, or one target, or one inventory.**

We will profile your information and celebrate your achievement on your city profile page. Looking forward to your reports!

What is the difference between an action and an action plan?

An **action plan** is a document that lists what steps must be taken in order to achieve a specific goal. The purpose of an action plan is to clarify what resources are required to reach the goal, formulate a timeline for when specific tasks need to be completed and determine what resources are required.

A **climate action plan** is a detailed and strategic framework for measuring, planning, and reducing greenhouse gas (GHG) emissions and adapting to related climatic impacts. Municipalities design and utilize climate action plans as customized roadmaps for making informed decisions and understanding where and how to achieve the largest and most cost-effective emissions reductions that are in alignment with other municipal goals. Climate action plans, at a minimum, include an inventory of existing emissions, reduction goals or targets, and analyzed and prioritized reduction actions. Ideally, a climate action plan also includes an implementation strategy that identifies required resources and funding mechanisms.

An action, on the other hand, is an individual activity reducing greenhouse gas (GHG) emissions and adapting to related climatic impacts. An action can be a soft measure such as establishing policy, strategy, financial mechanism, educational activities, drafting action plan, or implementable infrastructural activities, such as building energy generation plant.

How to report the "account info "sheet? (Watch the tutorial video)

Opening the sheet, you will see the official name of the reporting entity, Name of the geographic area administered by the reporting entity and the country name are pre-populated. If you do not see this information pre-populated, you are using an outdated reporting form. Please log-in to your account for the correct reporting sheets.

The account information consists of four sections:

- Identification of the reporting entity
- Contact information
- Mayor information
- Initiative information

The **identification of the entity** is used to create an account. Information reported here will be displayed on the **City Profile**. It is the most commonly used "keyword" for searching, selecting and retrieving reports from any particular reporting entity.

The Contact information of the city representative and the political head will remain confidential in our database. We will only use them for updating reminder or for inviting you to relevant user services.

The Initiative information tracks the initiative(s) a reporting entity has chosen to join. Depending on the initiative requirement**, the entity will receive tailor-made sheets** reflecting reporting requirements of the initiative.

This information will pre-populated for you. If you believe the pre-populated content does not reflect your status, or you wish to join other initiatives, please contact us at carbonn@iclei.org**.**

- Local government identification

Please notice that carbonn Climate Registry is a platform for local and subnational governments. Therefore, reporting entities registered shall be listed as "government ", rather than a city.

City or local government's names may spelled or pronounced differently in different languages. Alternatively, due to historical or geographical reasons, an entity might have more than one recognizable name. On the carbonn Climate Registry, we require an entity to report the "**official name of reporting entity**" in its **native language**, and **report entity's name in English**; Please report the actual city name under "Name of the geographic area administered by reporting entity.

Only the "**Entity name in English**" will appear on the **City Profile**. However, all city identification information can be used for report retrieving in the search box.

For example, Brussels Capital Region will report:

The "**Official name of the reporting entity**" as "Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest;

The "**Report entity's name in English**" as "Brussels Capital Region"

And the "**Name of the geographic area**" is reported as "Brussels Capital Region."

- Name of Country

Please select the name of your government's host country name from the drop-down list.

- Longitude and Latitude

Please indicate the longitude and latitude accurately, using three decismal places. This information will help llocate you on the map.

- Government logo

Please upload the logo of the reporting entity, which we will display on the city profile.

Please indicate the name and the format of the document on the reporting sheet, and then submit the file together with the reporting form via email to carbonn@iclei.org

- Contact information for the designated contact person

The designated contact person is responsible for updating and maintaining the report.

Please input The Name, Title, Department, Mailing address, Email address, and telephone number, of the designated contact person.

With this email, the carbonn center might contact the designated person for data clarification, report updating, and other relevant clarification requests.

- Contact information for the political head

Please provide the contact detail for the political head and its liaison.

We will invite the political head of pioneer city to relevant events and activities, including global campaign, connecting to finance opportunities, etc.

- Initiative Information

The carbonn Climate Registry supports 15 global initiatives and/or projects. Please indicate the participation to the listed initiatives. The platform will generate a tailor-made reporting sheet for the reporting entity, according to its initiative-participation choice.

This information will pre-populated for you. If you feel the pre-populated content does not reflect your status, or you wish to join other initiatives, please contact us via carbonn@iclei.org**.**

Don’t forget to update your profile regularly to maintaining the validity the reference.

How to report the “profile “sheet? (Watch the tutorial video)

Opening the sheet, you will see that the community type is pre-populated. If you do not see this information, you are using an outdated reporting form. Please log-in to your account for the correct reporting sheets.

A sustainability profile is built on the geopolitical, economic and environmental data in this section. This sheet is mandatory for all cCR reporting entities. We recommend that the reporting entity updates the profile information regularly. The profile serves as a valid benchmark for assessing your targets, action plans, and sustainability performance.

- Community type

carbonn Climate Registry categories the reporting entities to 8 types. Hovering your mouse over the information box here, you can find the detailed definition of each type. Here we pre-populate this information for you.

- General description and introduction to the reporting entity:

In this section, please summarize your entity and its most impressive sustainable features within 500 words. This summary will appear on the **Entity Profile** page, as part of city name card.

- Geopolitical information

Total area: Please indicate the total area administrated by the reporting entity in “square kilometer”. This area might include all land types and water area.

Geography type of the reporting entity: Please define the geography type of the reporting entity. the User can choose the land type from the drop-down list

Population: Please specify the registered population and its census year. Please also indicate the annual population change rate. The population and the population change rate are the most important factor for predicting energy and service consumption. Indicating population and its growth rate will help the public understanding your targets in a concrete context.

Main cities or Urban Centers: This is not a required reporting item. However, we recommend large cities and regional governments to indicate its urban center, so that we can differentiate entities with similar names and geographic boundaries.

- Socioeconomic Information

Socioeconomic information is an essential reference for the performance of sustainable development.

In this section, please indicate the **predominant economy sector**, by making a choice from the drop-down list.

Please describe **the local economy** in a short text. It is recommended to highlight the current major industry and the future plan in the green economy.

The GDP is an important economic indicator. Please report here your GDP, currency and census year. It will serve as an important reference to the commitments, performance, and actions of reporting entities.

- Government Information

In this section, the entity will introduce its local government and its way of governing.

Annual government expenditures and income, are specifically interested **in investors to judge local government’s action and action plan in a context.** If reporting entities are seeking for financial support through cCR, especially through TAP, please fill in this information.

If this information is not available or too sensitive, please provide at least the government annual budget and number of the government employee, with census year. We highly recommend you to come back updating them regularly.

Planning & Commitments

Please indicate the status of the mitigation and adaptation action plan in this section by making a selection in the drop-down list.

Regardless the status of the action plan, the reporting entity should describe the vision and goal for sustainable development. The description might include GHG emission reduction goals, Sustainable Development Goals, the specific department/industry involved, short time goal and long-term goals.

If you indicate the existence of an action plan, please provide their information in the "action plans" sheet.

If applicable, please describe how climate change impact might increase in the reporting entity's administrative area. Such impacting factors might include: Flooding increases the impacts of poor waste management; heat island effect might increase the consumption of energy, therefore, causing air pollution.

If applicable, please explain how climate change influence, negatively, on the local business. Such influence might include lower yielding of the economic agricultural product, due to temperature change.

Governance

In the governance section, the entity is encouraged to describe how governments review and manage the responsibility for climate change, the impact of national activities, how does master plan address GHG emissions reduction, incentives provided. Though not required, these items are extremely important for assessing your entity's action towards climate mitigation and adaptation, especially in the national/regional framework.

Don't for get to update your profile regularly to maintain the validity of the reference.

What is the boundary?

In the cCR, the reporting of commitment(s), performance(s) and action(s) are differentiated by the boundary, either through Community or Government operations. Boundaries of the two levels differ as such:

- **Community commitment/performance/action**: applies to all activities occurring throughout your local government's entire geographic area.

- **Government commitment/performance/action:** applies to activities limited to the local government's administrative operations (e.g. government owned buildings or facilities (street lighting, waste/wastewater treatment plants), as well as government staff training and capacity building).

Typically, government operations are a subset of community reporting. Reporting government operations separately from community contributes to the understanding of both the local governments' and the community's impact on climate change to support leadership and transparency.

Sometimes local government owns or operates facilities outside of its geographic administrative area. Therefore any subtraction or summing up between community and government operational reporting is allowed without special justification.

Although local and regional governments are encouraged to report both, please note reporting community commitments, performance and actions are particularly important in order to be selected as an One Planet City Challenge national or global finalist, as well as are a requirement for the Compact of Mayors.

How to report the "Target and commitments" sheet? (watch the tutorial video)

Open the sheet, you will see the official name of the reporting entities, the English name for the reporting entity and the country name is pre-populated. If you do not see this information pre-populated, you might use an outdated reporting form. Please log-in to your account for the correct reporting sheets.

Targets are quantifiable targets set by local and subnational governments to address mitigation and/ or adaptation.

Carbonn climate registry allows reporting entities to report climate targets on:

- Greenhouse gas emissions reductions, the first column
- Increased employment of renewable energy, the second column
- Increasing energy efficiency, the third column
- Other non-specified mitigation types, the fourth column
- Adaptation and resilience targets, the fifth column

Don't for getting to update your profile, once the target is adapted or achieved.

- Reporting the GHG emissions reduction target (watch the tutorial video)

1. Short summary of committed target (max. 140 characters)

Firstly, please provide a general summary of the committed target in English. You may use the fields below to guide the information summarized here. You might also include information such as where the commitment was published or announced, the reasons for the choice of the target type, and your planned sectoral actions to help achieve this target.

Keep in mind, the more information you provide, the easier it is to profile your leadership and commitment in our annual reports, **as well as to contribute to global climate advocacy processes, such as through the UNFCCC's Non-State Actor Zone for Climate Action (NAZCA) platform.**

2. Validity of the target

Please indicate if the target is proved by council or mayor. An officially proved target is considered an ambitious endeavor of the local and regional government. When possible please provide a copy of newspaper, website, or official approval documents as evidence.

Please indicate the file name of this document in the reporting sheet and send us the file as attachment together with your reporting sheet to carbonn@iclei.org.

3. Type of the reduction target

Type of the GHG emissions reduction target defines how the reduction will be measured.

- Choose an "Absolute base year reduction target", to measure your reduction target against the absolute GHG emission value in a base year. For example, your city or region has committed to reducing GHG emissions by 20% by 2050, compared to the 1990 level, this represents an "Absolute base year reduction target "
- Choose a " Baseline scenario (Business as usual BAU) reduction target", if your reduction is compared with the target year's business as usual (BAU) level. BAU is also called the baseline scenario level.
  A "businesses as usual level, (or baseline scenario)" level is defined as a "scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the activity." In other words, it's the emission level of a chosen target year, which represents where GHG emissions level would stand today, in the absence of mitigation and adaptation interventions.
  So, a "20% emissions reduction by 2020 compared to the BAU level" is an example of a Baseline scenario (BAU) reduction target. It means your government plan to reduce 20% of emission in 2020 compare to the 2020 emission level , if nothing will be done from now to 2020.
- Choose" Fixed-level reduction target", when your target is not compared to a year's emissions level, but rather measured directly in terms of tons of CO2e reduction. "reduction of 1million tons of CO2e by 2020", is a "Fixed-level reduction target".
- Please choose," Base year carbon intensity reduction target", when your greenhouse gas emissions target is set against a per GDP or per capita emission value in a historical base year– for example a "20% reduction of GHG emissions per capita by 2020" means, by 2020 the local government will emit only 80% of the per capital emission in its base year. Once the entity chose "base year carbon intensity target", please select carbon intensity unit compared to "per capita","per GDP" emission or " per unit energy" in the next cell.

4. Boundary covered by commitment

Target can be set for government's own municipal operations(Government), or for the entire administrative area(community).

A Community-scale GHG emission reduction target is required by the Compact of Mayors. Please make sure you have set at least one Community-scale GHG emission reduction target within your first 2 years of committing to the Compact of Mayors.

5. GHG emissions unit

GHG gas emissions can be measured as CO2 or CO2e. The latter stands for CO2 equivalent. When your target includes CO2 as well as other GHG gas emissions, please choose CO2e as a "Unit", and convert all non-CO2 GHG gases to their CO2 equivalent with Global warming potentials. For more information on how this is done, please consult the GPC document for detailed guidance and conversion support.

Once the entity chose "base year carbon intensity target", please select carbon intensity unit compared to "per capita","per GDP" emission or " per unit energy" .

6. Target value

Please insert the value of your reduction target here. Please note that we only accept **positive numeric value**. No unit, nor text nor negative mark is allowed.

For example, typing in 16 means, your city plan to reduce 16% of the emission. Please do NOT type -16, or 16%

We will combine the unit and the value for you. Please do not enter any text in this cell. Please spell out big number such as a million as 1 followed by 6 zeros, instead of writing down 1 million as text.

-16

16%

-16%

16% per capital

- 1000000

1 million

1000000 tCO2e

7. Target year and Base year

When setting a reduction target, you should define the “base year”: the year against which your target is measured, and the “target year”, the year when the target will be reached.

8. Total emission in base year

If you set a target against base year emission, please disclose the emission value in the base year. If your commitment was made before building a base year inventory, you can use the annotations on the left.

The absence of base year emissions significantly reduces the credibility and validity of your commitment. Therefore, if you do not have a base year inventory, we highly recommend you analyze the base year emission and update this information as soon as possible.

Same as the target value, please note that we only accept **positive numeric value**. No unit, nor text nor negative sign is allowed.

9. Year in which the target was adopted

Please indicate the year in which the commitment was officially adopted by the local government. This information helps us to identify your latest commitments and track leadership and ambition.

10. GHG emission source to which the target applies:

- "Stationary energy" implies emissions from energy generation, delivery, and consumption activities occurring at stationary sources. This sector includes emissions from energy consumption activities in buildings, community facilities, as well as industrial sites and agriculture/forestry farms.
- "Transport" implies emissions from energy consuming activities required to transport people and goods within and beyond city/regional borders. All emissions from private and public vehicles are included here.
- "Waste management" implies emissions from Waste/wastewater disposal and treatment activities. Please note that emissions from energy consumption at the waste/wastewater management site's are reported under stationary energy.
- "IPPU" implies emissions from non-energy related industrial activities and product use. Please note that activities related to energy consumption and energy recovery in industrial processes and product use, are reported as stationary energy. For example, emission from natural gas based furnace is reported under stationary energy, but SF6 emitted from a television factory will be reported under IPPU.
- AFOLU stands for Agriculture, Forestry and Other Land use activities. Please note that activities related to energy consumption and energy recovery in the AFOLU sector are reported as stationary energy. For example, the emission from heating agricultural products by burning coal is reported under stationary energy, however, CH4 from the crop land is reported under AFOLU.

The sector will help us connect your target with actions and initiatives in related fields.

11. Relation to other levels of government

Lastly, please indicate this target's relationship to the activities of government from other levels.

By indicating whether your target is a requirement by government from other levels, we can in turn vertically link and integrate targets from different administrative levels.

If you have more than one target of one type, please log in and download more target

- Reporting the renewable energy target (watch the tutorial video)

A Renewable energy target is the commitment to increase the share of renewable energy in the jurisdiction's energy mix. It is on the second column on the target and commitment sheet.

1. Short summary of committed target (max. 140 characters)

Firstly, please provide a general summary of the committed target in English. You may use the fields below to guide the information summarized here. You might also include information such as where the commitment was published or announced, the reasons for the choice of the target type, and your planned sectoral actions to help achieve this target.

Keep in mind, the more information you provide, the easier it is to profile your leadership and commitment in our annual reports, **as well as to contribute to global climate advocacy processes, such as through the UNFCCC's Non-State Actor Zone for Climate Action (NAZCA) platform.**

2. Validity of the target

Please indicate if the target is proved by council or mayor. An officially proved target is considered an ambitious endeavor of the local and regional government. When possible please provide a copy of newspaper, website, or official approval documents as evidence.

Please indicate the file name of this document in the reporting sheet and send us the file as attachment together with your reporting sheet to carbonn@iclei.org.

1. Boundary covered by target

Target can be set for government's own municipal operations(Government), or for the entire administrative area(community). Please choose the commitment boundary here.

2. Type of energy covered by target and target value

The type of target specifies how you would measure the planned achievement:

- **Choose "Target to increase the installed capacity of renewable energy generation (MW)" if you would like to build more renewable energy generation plants.**
  Once this target type is chosen, please insert a numerical value in the row below, indicating the planned installed capacity in target year for renewable energy. The unit for the target value is predefined as MW. Please do not insert the unit anymore. If your target is set with another unit, please convert it to MW, with tools such as The unit converter. http://www.unitconverters.net/
- **Choose "Target to increase the consumption of energy from renewable energy sources (MWh)" , if you plan to consume more renewable energy from the grid**
  Once this target type is chosen, please insert a numerical value in the row below, indicating the planned renewable energy consumption (in MWh) in target year. The unit for the target value is predefined as MWh. Please do not insert the unit anymore. If your target is set with another unit, please convert it to MWh, with tools such as The unit converter. http://www.unitconverters.net/
- **Choose "Target to increase the share of renewable energy in primary energy mix (%)" if you want to increase the percentage of renewable energy as primary energy**
  Once this target type is chosen, please insert a numerical value as percentage in the row below, indicating the planned renewable energy in primary energy mix in target year. The unit for the target value is predefined as %. Please do not insert the unit anymore.
- **Choose Target to increase the share of renewable energy in final energy mix (%)if you want to increase the percentage of renewable energy as final energy**
  Once this target type is chosen, please insert a numerical value as percentage in the row below, indicating the planned renewable energy in final energy mix in target year. The unit for the target

value is predefined as %. Please do not insert the unit anymore.

What is the difference between Primary energy and Final Energy?

• Primary energy is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels, and other forms of energy received as input into a system. A target in terms of primary energy, entails your city/region has made a commitment to increase the share of renewable energy of your energy supply mix.

• Final energy designates the energy consumed across different sectors. Target in terms of final energy means commitment to increase the share of renewable energy consumed throughout your city/region's relevant sectors.

For example, let us assume that a city has within its boundary the use of 100MJ of primary energy, and the consumption of 60MJ of final energy. Committing to achieve a share of renewable energy of 40% in the primary energy matrix corresponds to generate 40MJ, and in the final energy matrix corresponds to 24MJ.

3. Target year

The “target year” is the year when the target will be reached.

4. Year in which target was adopted

Please indicate the year in which the target was officially adopted by the local or subnational government. This information helps us identifying your latest targets and track your jurisdiction’s level of ambition.

5. Current energy performance

Please indicate the current energy performance in the same format as the type of the target chosen. Please note that the reporting requirements and unit are predefined by the choice of target type. Please only insert a numerical value without double reporting the unit. Please indicate the census year, as the important reference of the performance value.

Current energy performance will help us identify the level of ambition of your target.

6. Applicable energy sectors:

In this section, please indicate in which sector(s) you target applies.

Choose Electricity, if you plan to generate renewable energy

Choose transport, if renewable energy sources are specifically intended to serve transportation purpose, such as electricity vehicles, public bus lines powered by renewable energy grid;

Choose “heating” if the planned renewable energy consumption is used in heating purpose, such as solar panel water heating devices

Chose “Industry” if the renewable energy is mainly consumed in the industrial sectors:

The sector will help us connect your target with actions and imitative in related fields.

7. Relation to other levels of government

Lastly, please indicate this target's relationship to the activities of government from other levels.

By indicating whether your target is a requirement by the government from other levels, we can in turn vertically link and integrate targets from different administrative levels.

- Reporting the energy efficiency target (watch the tutorial video)

The energy efficiency target is on the third column of the target and commitments sheet. It sets a goal to increase the energy efficiency and therefore save total energy consumption.

1. Short summary of committed target (max. 140 characters)

Firstly, please provide a **general summary of the committed target in English**. You may use the fields below to guide the information summarized here. You might also include information such as where the commitment was published or announced, the reasons for the choice of the target type, and your planned sectoral actions to help achieve this target.

Keep in mind, the more information you provide, the easier it is to profile your leadership and commitment in our annual reports, as well as to contribute to global climate advocacy processes, such as through the UNFCCC's **Non-State Actor Zone** for Climate Action (NAZCA) platform.

2. Validity of the target

Please indicate if the target is proved by council or mayor. An officially proved target is considered an ambitious endeavor of the local and regional government. When possible please provide a copy of newspaper, website, or official approval documents as evidence.

Please indicate the file name of this document in the reporting sheet and send us the file as an attachment together with your reporting sheet to carbonn@iclei.org.

3. Boundary covered by target

The target can be set for government's own municipal operations(Government), or for the entire administrative area(community). Please choose the commitment boundary here.

4. The type and value of the energy efficiency target

The target type specifies the measurement of the goal.
Please define the energy type, against which the target is set. In other words, you are choosing the type of energy to be saved through efficiency improvement.

Please note that the choice of the target type will influence the base year energy performance below.

• Primary energy, is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels, and other forms of energy received as input into a system. A Target in terms of primary energy, entails your city/region has made a target to save energy supply mix through energy efficiency improvement action(s).

• Final energy designates the energy consumed across different sectors. Target in terms of final energy means target to save energy consumption mix through energy efficiency improvement action(s).

For example, let us assume that a city has within its boundary the use of 100MJ of primary energy, and the consumption of 60MJ of final energy. Committing to save energy of 40% in the primary energy matrix corresponds to generate 40MJ, and in the final energy matrix corresponds to 24MJ.

5. Target value: value of energy consumption reduction

Please indicate percentage of energy reduction rate here, in comparing to base year energy consumption value.

If you enter 16 , it means 16 % of final or primary energy will be saved compare to the base year energy performance.

6. Target year and base year

Please define the "base year": the year against which your target is measured, and the "target year", the year when the target will be reached.

7. Year in which target was adopted

Please indicate the year in which the target was officially adopted by the local or subnational government. This information helps us identifying your latest targets and track your jurisdiction's level of ambition.

8. Energy consumption and renewable energy share in energy mix in base year

Please disclose the renewable energy share, in percentage and the total energy consumed in unit of MWh, in the base year. This information can help us to better understand you target and evaluate your ambition.

The unit is predefined. Please do not insert the unit anymore. If your energy consumption is compiled with another unit, please convert it to MWh, with tools such as the unit converter. http://www.unitconverters.net/

9. Applicable energy sectors:

In this section, please indicate in which sector(s) will you target applies. For others, please specify in the text box provided.

The sector will help us connect your target with actions and imitative in related fields.

10. Relation to other levels of government

Lastly, please indicate this target's relationship to the activities of government from other levels.

By indicating whether your target is a requirement by government from other levels, we can in turn vertically link and integrate targets from different administrative levels.

- Reporting other mitigation targets (watch the tutorial video)

If the mitigation target cannot be specified as GHG emissions reduction, renewable energy, nor energy efficiency, the reporting entity can use this section to report "non-specified" mitigation target. Such **target can be sector specific, such as the length of a bike line, or improvement of municipal waste management.**

1. Short summary of committed target (max. 140 characters)

Firstly, please provide a general summary of the committed target in English. You may use the fields below to guide the information summarized here. You might also include information such as where the commitment was published or announced, the reasons for choice of target type, and your planned sectoral actions to help achieve this target.
Keep in mind, the more information you provide, the easier it is to profile your leadership and commitment in our annual reports, as well as to contribute to global climate advocacy processes, such as through the UNFCCC's Non-State Actor Zone for Climate Action (NAZCA) platform.

2. Validity of the target

Please indicate if the target is proved by council or mayor. An officially proved target is considered an ambitious endeavor of the local and regional government. When possible please provide a copy of newspaper, website, or official approval documents as evidence.

Please indicate the file name of this document in the reporting sheet and send us the file as attachment together with your reporting sheet to carbonn@iclei.org**.**

3. Boundary covered by target

The target can be set for government's own municipal operations(Government), or for the entire administrative area(community). Please choose the commitment boundary here.

4. Target value and means of measuring

Please insert target value in numerical number and means of measuring, including unit as text in the box below**. If your target is to build a bike line. Such target value can be "12", the means of measuring shall be "kilometers of bike line to be built". Please do not forget to specify the unit of the measurement.**

5. Target year and Base year

When setting a reduction target, please define the "base year": the year against which your target is measured, and the "target year", the year when the target will be reached.

6. Year the target was adopted

Please indicate the year in which the target was officially adopted by the local government. This information helps us to identify your latest targets and track your jurisdiction's level of ambition.

7. Base year value

If applicable please illustrate the performance in the base year in the same means of measurement defined before.

The base year value is a necessary reference to understand the ambition of your target.

For example, if your target is to build 12 km cycling line by 2020, please report the length of cycling line in the base year, for example 1 km in 2000. Both numerical value and units are required here.

8. Relation to other levels of government

Lastly, please indicate this target's relationship to the activities of government from other levels.

By indicating whether your target is a requirement by government from other levels, we can in turn vertically link and integrate targets from different administrative levels.

- Reporting Adaptation or resilient commitments (watch the tutorial video)

An adaptation commitment illustrates **the goal to adapt climate change impacts within local jurisdiction.** In this commitment, please specify the risk or vulnerability your goal will address. Please do not forget to report the indicator, measurement used to evaluate the achievement of the goal.

1. Short summary of committed target (max. 140 characters)

Firstly, please provide a general summary of the committed target in English. You may use the fields below to guide the information summarized here. You might also include information such as where the commitment was published or announced, the reasons for the choice of the target type, and your planned sectoral actions to help achieve this target.

Keep in mind, the more information you provide, the easier it is to profile your leadership and commitment in our annual reports, **as well as to contribute to global climate advocacy processes, such as through the UNFCCC's Non-State Actor Zone for Climate Action (NAZCA) platform.**

2. Validity of the target

Please indicate if the target is proved by council or mayor. An officially proved target is considered an ambitious endeavor of the local and regional government. When possible please provide a copy of newspaper, website, or official approval documents as evidence.

Please indicate the file name of this document in the reporting sheet and send us the file as attachment together with your reporting sheet to carbonn@iclei.org**.**

3. Boundary covered by target

The target can be set for government's own municipal operations(Government), or for the entire administrative area(community). Please choose the commitment boundary here.

4. Target value and the means of measuring

Since adaptation and resilience is such a wide-ranging topic, please define in the descriptive box, what measurement you prefer to set, to evaluate your adaptation/resilience achievement.
For example, it could be:

- Reaching zero deforestation by 2030
- Preserving, restoring and sustainably managing natural resources in island ecosystems by 2018
- Pledging to devote 50% of the climate action budget to adaptation actions by 2016
- Protecting and conserving natural habitat and wildlife by creating 100 km2 natural protection zone
- Ensuring 100% of the population has access to potable water and adequate sanitation

9. Target year and Base year

When setting a reduction target, please define the "base year": the year against which your target is measured, and the "target year", the year when the target will be reached.

10. Year the target was adopted

Please indicate the year in which the target was officially adopted by the local government. This information helps us to identify your latest targets and track your jurisdiction's level of ambition.

11. Base year value

If applicable, please illustrate the performance in the base year in the same means of measuring and evaluating defined before.

The base year value is a necessary reference to understand the ambition of your target.

For example, if your target is to protect and conserve natural habitat and wildlife by creating 100 km2 natural protection zone, you must indicate the current area for natural wildlife protection zone, for example 20 km2 in the base year. Both value and units are required.

12. Relation to other levels of government

Lastly, please indicate this target's relationship to the activities of government from other levels.

By indicating whether your target is a requirement by government from other levels, we can in turn vertically link and integrate targets from different administrative levels.

How to report the "Action plan" sheet? (watch the tutorial video)

Open the sheet, you will see the English name for the reporting entity is pre-populated. If you do not see this information, you are using an outdated reporting form. Please log-in to your account for the correct reporting sheets.

In this section, the reporting government provides a brief overview of its sustainable action plan. Individual actions should be reported in the separated "Action Sheet,". An action plan includes more than one actions. The action is an individual activity toward achieving the action plan. For example, to reach carbon neutrality is an action plan. Building renewable energy power plants, purchasing carbon credit to offset the GHG emissions are two individual actions within this action plan. For detailed explanation, please visit relevant section "What is the difference between action and action plan?"

The **name of the action plan**: Please indicate the name of your action plan. This information will be displayed on your profile page. The name usually consists the **city's name, the action plan's type, the valid period or adopted year**, for example_ Bonn's 2015 Climate Mitigation Action plan is the name of the action.

The **type of the action plan:** An action plan can be typed as "Climate mitigation action plan", if it is focusing on reducing Greenhouse Gases(GHG); An action plan can be typed as "Climate adaption/resilience plan", if it is focusing on adapting the risks and vulnerabilities caused by climate change; If the action plan addresses both GHG reduction and risks and vulnerabilities adaptation, please type it as "Integrated climate action plan".

Year adopted by the council: Please indicate the year of official adoption from the drop-down list. This information helps us to track progress of action plans development.

Primary author: please indicate the organization, who is responsible for the compilation and publication of the action plan. It can be the Mayor's office or environment department.

When possible please provide a copy of newspaper, website, or official approval documents as evidence.

Please indicate the file name of this document in the reporting sheet and send us the file as an attachment together with your reporting sheet to carbonn@iclei.org.

Summary of the action plan: The summary should include the city context information, main goal, sectoral activities and impacts expected. The summary will be displayed on your profile page to public as a great name card to your ambition and vision.

Summary provided in English will increase the transparency and publicity of your report. Keep in mind, the more information you provide, the easier it is to profile your leadership and commitment in our annual reports, **as well as to contribute to global climate advocacy processes, such as through the UNFCCC's Non-State Actor Zone for Climate Action (NAZCA) platform.**

Please briefly illustrate the **stakeholder identified** and the **awareness-raising and public involvement activities**. They are important information to the public. Though not required, they will increase the transparency of your action plan.

Mitigation and adaptation sectors: Please tick all sectors your action plan will influence. We will compare the selected sectors with the sectors of your actions to see the relationship between action plan and individual action implementation.

Estimated Outcomes: Please indicate the estimated out comes in the pre-defined units. Please report a numerical value without entering unit. If impacts data is collected with another unit, please convert it to the required units, with tools such as The unit converter. http://www.unitconverters.net/

How to report the "Inventory-GPC" sheet? (watch the tutorial video)

It is the place reporting government tracks the GHG inventory within its geographic boundary, according to the requirement of GPC (Protocol for Community-Scale Greenhouse Gas Emissions). **If you face difficulty to fill in the inventory according to GPC. You can download the simplified version. If you wish to report GHG emission from government operation, please use sheet 7. "GHG inventory Government sheet". For understanding the difference between community and government operation inventories, please go to " What is the boundary" section.**

Open the sheet, you will see the English name for the reporting entity is pre-populated. If you do not see this information, you are using an outdated reporting form. Please log-in to your account for the correct reporting sheets.

Why should I use GPC standard to build a GHG inventory?

GPC inventory is a community Performance tracked according to Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), a globally recognized standard for community-scale GHG inventories. It ensures credibility and comparability of community's inventory for enhanced vertical integration with subnational and national levels of government– and notably accounts for the 7 gases listed in the Kyoto Protocol.

GPC compliant inventory is required by the Compact of Mayors, and recommended by the One Planet City Challenge (especially for OECD countries) and other initiatives. We highly recommend entities report for GPC compliance, however if you feel your jurisdiction lacks the information and capacity to fulfill GPC requirements, please skip this section and refer to the simplified version for reporting community scale inventories in the following tab.

ICLEI offers GPC training to local and subnational governments. Please contact us via carbonn@iclei.org for more information.

For GPC compliant community emission performance reporting, please complete the following information below:

1. Inventory year

The inventory year is the historical year, against which the performance is tracked in terms of total GHG emissions. Please note that the inventory year is the year emissions occurred, not necessarily the year the inventory is made.

For example, if a city is compiling a GHG inventory in 2015, using data from 2011 to record the GHG emissions emitted from that year, the inventory year will be 2011, reflecting the time of occurring of the emissions, NOT 2015 when the inventory was made.

2. Geographic boundary

GPC requires the local/regional government to establish a geographic boundary that identifies the spatial dimension or physical perimeter of the inventory's boundary. Please indicate here if the inventory boundary

matches the administrative area of the reporting entity, defined in the account info page. If not, please specify the exclusions and/or additions to the administrative boundary in the descriptive box below.

3. Land area, population and GDP

To better assess the reported GHG emissions inventory, please also provide the necessary background, namely, land area population and GDP, which are important benchmarking indicators for comparison, contrast and learning.

4. GHG emissions reports and supporting documents

Besides reporting quantitative inventory information below, the cCR recommends users submit a qualitative summary of their GHG inventory. Covenant of Mayors signatory cities can directly upload a "Covenant of Mayors Baseline Inventory Report", other GPC users can upload Greenhouse gas emissions inventory reports. Compact of Mayors committed cities are required to upload activity data and emission factors here.

5. Relation to other levels of government

Please indicate this commitment's relationship to existing inventories at other levels of government.

By indicating whether this inventory is included within sub-national or national inventories, we can link performances and vertically integrate the effects.

6. Confidentiality

The cCR allows cities to keep total GHG emissions inventory confidential. By ticking this box, we will hide the total emissions inventory reported, and only present the sectoral emissions as a percentage.

7. Scope 3 emissions

The GPC categorizes emissions by sources and by scopes. Scopes 3 emissions account for all other GHG emissions that occur outside the city boundary as a result of activities taking place within the city boundary.

Accounting for Scope 3 emissions requires more comprehensive data collection and higher government capacity. It also represents the level of commitment a government has made to account for and manage all GHG emissions which have resulted from in-boundary activities. Please upload your Scope 3 emissions analysis. This will serve as an example to peer cities and regions for developing scope 3 emissions inventories in the future.

8. Tools and software used

Though reported in GPC compliant format, we understand that a user's GHG inventory might be based on different standards /protocols, or have employed different software or tools. Please indicate the standard, protocol, tools or software used in the field here (*show on the reporting form where*) to helping us track the compatibility of common standards, or software.

9. Comments on your inventory

Should you have any other qualitative comments on the reported inventory, especially regarding changes from the latest reported inventory?Please record them in the following boxes. Though not required, those descriptive boxes provide users more freedom to illustrate their inventory status and process. Your descriptive texts can help us better understand your report. They will also provide us with a basis to demonstrate your inventory as a model to other local governments, in the cCR's biannual digest, or on our website linked to relevant initiatives, such as the OPCC, the Compact of Mayors or NAZCA.

10. Verification and comments

Cities may choose to verify their GHG emissions inventory to demonstrate that it has been developed in accordance to the requirements of the GPC, and provide assurance to users that it represents a robust, transparent, and comprehensive account of their city or region's GHG emissions. This can be used to increase the credibility of publicly-reported emissions information with external audiences and in turn increase confidence and potential investments based on the data used, to develop climate action plans, set GHG targets and track progress.

While verification is often undertaken by an independent organization (i.e. third-party verifier), this may not always be the case. Many governments interested in improving their GHG inventories may undergo a process of internal verification by members of staff which have been independent from the GHG accounting and reporting process (self-verification). Both types of verification should follow similar procedures and processes. For external stakeholders, a third-party verification is likely to significantly increase the credibility of the GHG inventory. However, self-verification can also provide valuable assurance over the reliability of information.

In this section please indicate your verification status, report an external verifier, if any, as well as the year of verification and comments /future plans if any.

How to report data in the GPC template:

The GPC requires cities to report emissions by gas, scope, sector and subsector.

1. emission sources under GPC—What to report

According to the GPC, GHG emissions from local and subnational entities shall be classified into six main sectors:

• **Stationary energy**: emissions from fuel combustion, as well as fugitive emissions released in the process of generating, delivering, and consuming useful forms of energy (such as electricity or heat) are reported here

• **Transportation**: records emissions from combusting fuel or consuming grid-delivered electricity in transport vehicles and mobile equipment or machinery.

• **Waste**: Emissions through aerobic or anaerobic treatment of waste and waste water are reported here. **Please note that emissions from energy consumptions at waste treatment facilities are reported under stationary energy sector "Commercial and institutional buildings and facilities" sub-sector.**

• **Industrial processes and product use (IPPU)**: All GHG emissions occurring from industrial processes, product use, and non-energy uses of fossil fuel are reported here**. Please note that emissions from energy consumptions at industrial facilities are reported under stationary energy sector "Commercial and institutional buildings and facilities" sub-sector.**

• **Agriculture, forestry, and other land use (AFOLU):** GHG emissions through a variety of pathways, including land-use changes that alter the composition of the soil, methane produced in the digestive processes of livestock, and nutrient management for agricultural purposes are reported here. **Please note that emissions from energy consumptions at agricultural facilities are reported under stationary energy sector "Commercial and institutional buildings and facilities" sub-sector.**

• **Other scope 3 emissions** are Any other emissions occurring outside the geographic boundary as a result of city activities within the boundary.

To understand the detailed emission categorization, please consult GPC document, which you can download from carbonn.org/support

2. Gases, data quality and comments—how to report

In this table, we listed all the emission sources according to the GPC. For each emission source, please report the GHG gases, CO2 equivalence of that gas converted from the global warming potential (GWP), and assess the quality of activity data and emission factors.

Please note that

- According to the GPC, GHG emissions shall be reported in metric tonnes and expressed by gas (CO2, CH4, N2O, HFCs, PFCs, SF6, and NF3) and by CO2 equivalent (CO2e).CO 2 equivalent can be determined by multiplying each gas by its respective global warming potential (GWP). Here, we do not provide an automatic converting function between each GHG gas and total CO2 equivalent (CO2e). The user shall choose the appropriate GWP, described in the GPC Chapter 5 and report the converted CO2 equivalent in the CO2e column. **Only the CO2e reporting will be used to account the total city or regional inventory! Please make sure that your city or region fills in the CO2e value.**
- **The Compact of Mayors compliant cities are required to express emissions as CO2e as well as at least the following individual gases: CO2, CH4 and N2O.Please make sure that your city or region fill in the CO2, CH4 and N2O columns when relevant.**
- The quality of activity data and emission factors are measured by the data source. **Please indicate the data source from the drop-down list. This indication is a Compact of Mayors compliance requirement.**
- Finally, users are required to disclose their choice of methodology, the exclusion of emissions, or other comments in text box. For more information on the choice of accounting methodology, please refer to Appendix C of the GPC protocol.
- To accommodate limitations in data availability and differences in emission sources between reporting entities, the GPC requires the use of the following notation keys to justify the absence of required emission sources, as recommended in IPCC Guidelines. Where notation keys are used, cities shall provide an accompanying explanation to justify exclusions or partial accounting of GHG emission sources. Please make sure the descriptive box is filled when you use a national key. **Please note that according to Compact of Mayors' compliance requirements, emissions from stationary energy, inboudnary transport and waste management sectors are compulsory, therefore the use of the NE notation key will not be accepted.**
- The definition of notation keys is displayed here.

Notation key	Definition	explanation
IE	Included Elsewhere	GHG emissions for this activity are estimated and presented in another category of the inventory. That category shall be noted in the explanation.
NE	Not Estimated	Emissions occur but have not been estimated or reported; justification for exclusion shall be noted in the explanation.
NO	Not occurring	An activity or process that does not occur or exist within the city.
C	Confidential	GHG emissions which could lead to the disclosure of confidential information and can therefore not be reported.

How to calculate total emissions

The GPC requires adding up emissions via two distinct but complementary approaches:

- The Scopes framework: helps to differentiate emissions occurring physically within the city (scope 1), from those occurring outside the of city (scope 3) and from the use of electricity, steam, and/or heating/cooling supplied by the grids which may or may not cross city boundaries (scope 2). Scope 1 emissions may also be termed as "territorial" emissions because they occur discretely within the territory defied by the geographic boundary.
- City-induced framework: This totals GHG emissions attributable to activities taking place within the geographic boundary of the city. It covers selected scope 1, 2 and 3 emission sources representing the key emitting sources occurring in almost all cities, and for which standardized methods are generally available.

These distinct but complementary approaches allow reporting entities to have a comprehensive understanding of their total emission s(city-induced), while avoiding double counting and miss-counting in inventory aggregation and comparison(territorial).

This colorful table is designed to facilitate users reporting via two approaches.

This first column lists the names of emission sources and different sectors and subsectors. Besides that, you'll see the emission scope indicated in brackets.

In addition, GPC framework is color coded to help your reporting:

- The green emissions sources are required for the BASIC level reporting
- The green and blue emission sources are required for the BASIC+ level reporting
- The orange/yellow represents sources included in the Other scope 3
- The red /purple sources are required for territorial total but NOT for the city-induced framework reporting

By inserting one value, you can see that it is automatically calculated in the summary table above.

How to report the "Energy Performance" sheet? (watch the tutorial video)

Open the sheet, you will see the English name for the reporting entity is pre-populated. If you do not see this information, you are using an outdated reporting form. Please log-in to your account for the correct reporting sheets.

The energy performance tracks the consumption and generation of energy. The reporting sheet categorizes the performance from the following aspects:

- **Background information:** Here we collect inventory year, boundary, population and GDP. The background information is crucial reference for understanding the energy generation and consumption;
- **Final energy consumption**: Final energy designates the energy consumed across different sectors. Reporting final energy consumption by fuel types and by economic sectors helps the reporting entity to identify carbon intensive sectors and therefore plan mitigation actions to improve energy efficiency there. The consumption is reported by different energy sources, in the unit of MWh. Please report a

numerical value without entering unit. If your energy consumption data is collected with another unit, please convert it to MWh, with tools such as The unit converter. http://www.unitconverters.net/

- **Local energy generation**: Energy generation helps understanding the local government's contribution to reducing GHG and air pollutants from a productive perspective. The generation is reported in terms of installed capacity, primary energy input (the amount of row energy used to generate heat and electricity) and local energy output(the amount of heat/cooling or electricity generated within the geographic boundary). The generation is reported by different energy sources, in the unit of MWh. Please report a numerical value without entering unit. If your energy generation data is collected with another unit, please convert it to MWh, with tools such as The unit converter. http://www.unitconverters.net/

- **Local government operation**:
  Here please specify the energy generation and consumption for government operations. They are the facilities that owned by, operated by or financially controlled by the local government. Such facility usually includes street lighting system, government buildings and waste treatment facilities. The data is reported by different energy sources, in the unit of MWh. Please report a numerical value without entering unit. If your data is collected with another unit, please convert it to MWh, with tools such as The unit converter. http://www.unitconverters.net/

- **Energy imports, exports and transmission losses**

  Energy import is the amount of energy purchased from and generated from outside of the geographic boundary; Energy exports is the amount of energy generated within the geographic boundary but sold to outside of the boundary. During the transmission and distribution of electricity, steam, heating and cooling on a grid, some of the energy produced at the power station is lost during delivery to the end consumers. This value is calculated by multiplying total consumption for each grid-supplied energy type by their corresponding grid loss factor, which is usually provided by local utility or government publications. When the grid loss factor is not available by your local government, please use the national value as reference, see The World Bank's World Development Indicators (WDI) for an indication of national transmission and distribution losses as a percent of output, see: http://data.worldbank.org/indicator/EG.ELC.LOSS.ZS

- When you face difficulty to provide required performance information, please justify the absence with the annotations on the right-hand side.

Notation key	Definition	explanation
IE	Included Elsewhere	Energy for this activity are estimated and presented in another inventory category. That category shall be noted in the explanation.
NE	Not Estimated	Energy generation or consumptions occur but have not been estimated or reported; justification for exclusion shall be noted in the explanation.
NO	Not occurring	An activity or process that does not occur or exist within the city.
C	Confidential	Data which could lead to the disclosure of confidential information and can therefore not be reported.

How to report the "GHG inventory -Government "sheet? (watch the tutorial video)

Open the sheet, you will see the official name of the reporting entities, English name for the reporting entity and the country name is pre-populated. If you do not see this information pre-populated, you might use an outdated reporting form. Please log-in to your account for the correct reporting sheets.

In the cCR, the reporting of commitment(s), performance(s) and action(s) are differentiated by boundary, either through Community or Government operations. Boundaries of the two levels differ as such:

- **Community** commitment/performance/action: applies to **all activities occurring throughout your local government's entire geographic area**.

- **Government** commitment/performance/action: applies to **activities limited to the local government's administrative operations** (e.g. government owned buildings or facilities (street lighting, waste/wastewater treatment plants), as well as government staff training and capacity building).

Typically, government operations are a subset of community reporting. Reporting government operations separately from community contributes to the understanding of both the local governments' and the community's impact on climate change to support leadership and transparency.

Sometimes a local government owns or operates facilities outside of its geographic administrative area. Therefore, any subtraction or summing up between community and government operational reporting is allowed without special justification.

Although local and regional governments are encouraged to report both, please note reporting community commitments, performance and actions are particularly important in order to be selected as an Earth Hour City Challenge national or global finalist.

Once the "government" is chosen as boundary, the related reporting sheet will appear.

1. Please firstly indicate the inventory year and inventory boundary

The inventory year, is the historical year, against which performance is tracked in terms of total GHG emissions. Please note that the inventory year is the year emissions occurred, not necessarily the year the inventory is made.

For example, if a city is compiling a GHG inventory in 2015, using data from 2011 to record the GHG emissions from that year, the inventory year will be 2011, reflecting the time of occurring emissions, NOT 2015 when the inventory was made.

The Governmental operational boundary is representing the level of administrative operational and or financial control. Please define how your government boundary is defined:

- based on the operational control (emissions sources that are actually operated by the local government, such as governmental building and vehicles)
- based on financial control (emission sources that are financed by local government, such as street lighting, waste management plant, ports and airports, etc.),
- Both government operated facilities and financed facilities are included in the inventory
- Please specify the way the government inventory boundary is set, if none of the above describes your situation.

2. background info

To better understand government inventory, please provide the following administrative information. This will help us better assess and compare the reported inventory:

- Number of government employees in inventory year
- Government budget in inventory year
- Total energy consumption for local government operations in inventory year

3. Inventory detail

According to International Local Government Greenhouse Gas Emissions Analysis Protocol (IEAP), local and subnational GHG emissions are categorized in 8 sectors:

- Energy related emissions from government buildings: this represents emissions from energy consumption in the following government buildings:
  - ✓ Residential
  - ✓ Non-residential
- Energy related emissions from government facilities: in other words, emissions from energy consumption at government controlled facilities, including:
  - ✓ Power generation facilities
  - ✓ Street lighting and traffic signals
  - ✓ Waste and wastewater treatment plants
  - ✓ Other government facilities

.

- Emissions from transport activities, includes emissions from energy consumption arising from government controlled transport vehicles:
  - ✓ Municipal fleet : energy consumption emissions in government owned vehicles for staff commute and government activities
  - ✓ Public transport: emissions from energy consumption in government controlled public transport vehicles
- "Emissions from government operated industrial processes and product use (IPPU) "includes non-energy related emissions from government controlled industrial processes and product use. Please note that emissions from industrial facilities' energy consumption, is reported under "energy related emissions from industrial and construction sites".
- Emissions from government activities in agriculture, forestry and other land use: GHG emissions arising from land-use changes that alter the composition of the soil, methane produced in the digestive processes of livestock, and nutrient management for agricultural purposes. Please note that emissions from energy consumption at agricultural sites are reported under "Energy related emissions from commercial and institutional buildings and facilities" energy- "other facilities".
- Emissions from government controlled waste and waste water treatment: Emissions through aerobic or anaerobic treatment of waste and waste water. Please note that emissions from energy consumption at waste treatment facilities are reported under "Energy related emissions from commercial and institutional buildings and facilities" energy- "other facilities".

- Other emissions: includes the sum of GHG emissions from other sources, as:
  - ✓ Other scope 3 emissions: any other emissions occurring outside the geographic boundary as a result of city or regional activities
  - ✓ Fugitive emissions: fugitive emissions released in the process of generating, delivering, and consuming useful forms of energy.

3. supporting documents and comments

Besides reporting quantitative inventory information below, the cCR recommends users submit a qualitative summary of their GHG inventory. Covenant of Mayors signatory cities can directly upload a "Covenant of Mayors Baseline Inventory Report".

We also encourage you to make qualitative comments on the reported inventory, especially on the changes which have occurred between reported inventories in the following boxes here. Though not required, the descriptive boxes provide users more freedom to illustrate their inventory process and accounting methodology, to help us better understand your report. They will also provide us with a basis to demonstrate your inventory as model via the cCR's biannual digest or, through various related cCR supported initiatives such as EHCC or Compact of Mayors. In addition the more complete and robust your reported data is, the higher the chance this will be used in global advocacy processes and platforms such as the UNFCC's Non-State Actor Zone for Climate Action platform.

4. Inventory information

- Relation to other levels of government

Please indicate this commitment's relationship to existing inventories at other levels of government.

By indicating whether this inventory is included within sub-national or national inventories, we can link performance and vertically integrate the effects.

- Confidentiality

The cCR allows cities to keep total GHG emissions inventory confidential. By ticking this box, we will hide the total emissions inventory reported, and rather only present the sectoral emissions as a percentage.

- Scope 3 emission

GPC categorizes emissions by sources and by scopes. Scopes 3 emissions account for all other GHG emissions that occur outside the city boundary as a result of activities taking place within the city boundary.

Accounting for Scope 3 emissions requires more comprehensive data collection and higher government capacity. It also represents the level of commitment a government has made to account for and manage all GHG emissions, which have resulted from in-boundary activities. Please upload your Scope 3 emissions analysis. This will help serve as an example to peer cities and regions and developing scope 3 emissions inventories in the future.

- Verification and comments

Cities may choose to verify their GHG emissions inventory and provide assurance to users that it represents a robust, transparent, and comprehensive account of their city or region's GHG emissions. This can be used to

increase credibility of publicly-reported emissions information with external audiences and in turn increase confidence and potential investments based on the data used, to develop climate action plans, set GHG targets and track progress.

While verification is often undertaken by an independent organization (i.e. third-party verifier), this may not always be the case. Many governments interested in improving their GHG inventories may undergo a process of internal verification by members of staff which have been independent from the GHG accounting and reporting process (self-verification). Both types of verification should follow similar procedures and processes. For external stakeholders, third-party verification is likely to significantly increase the credibility of the GHG inventory. However, self-verification can also provide valuable assurance over the reliability of information.

In this section please indicate your verification status, report an external verifier, if any, as well as the year of verification and comments /future plans if any.

- tools and software used

We understand that a user's GHG inventory might be based on different standards /protocols, or have employed different software or tools. Please indicate the standard, protocol, tools or software used in the field here (*show on the reporting form where*) to helping us track the compatibility of common standards, or software.

How to report the "Community inventory -Simplified "sheet?

Open the sheet, you will see the official name of the reporting entities, English name for the reporting entity and the country name is pre-populated. If you do not see this information pre-populated, you might use an outdated reporting form. Please log-in to your account for the correct reporting sheets.

According to International Local Government Greenhouse Gas Emissions Analysis Protocol (IEAP), local and subnational GHG emissions are categorized in 8 sectors:

- Energy related emissions from residential buildings: these constitute emissions from energy consumption in the following residential buildings: single family homes, or residential buildings for single family residences, or Multi-family homes, apartments for more than one family's residence
- Energy related emissions from commercial and institutional buildings and facilities: this entails emissions from energy consumption in commercial and institutional buildings and facilities. Please note that street lighting counts as a "facility" here.
- Energy related emissions from industrial and construction sites: includes emissions from energy consumed at industrial and construction sites. Please note that emissions from power generation are also reported here.
- Emissions from transport activities, includes emissions from energy consumed from the following transport vehicles:
- "Emissions from industrial processes and product use (IPPU) "includes non-energy related emissions from industrial processes and product use. Please note that emissions from energy consumed at industrial facilities must be reported under "energy related emissions from industrial and construction sites".
- Emissions from agriculture, forestry and other land use: includes GHG emissions which arise from land-use changes that alter the composition of the soil, methane produced in the digestive processes of livestock, and nutrient management for agricultural purposes. Please note that emissions from energy consumption at agricultural sites are reported under "Energy related emissions from commercial and institutional buildings and facilities" energy- "other facilities".

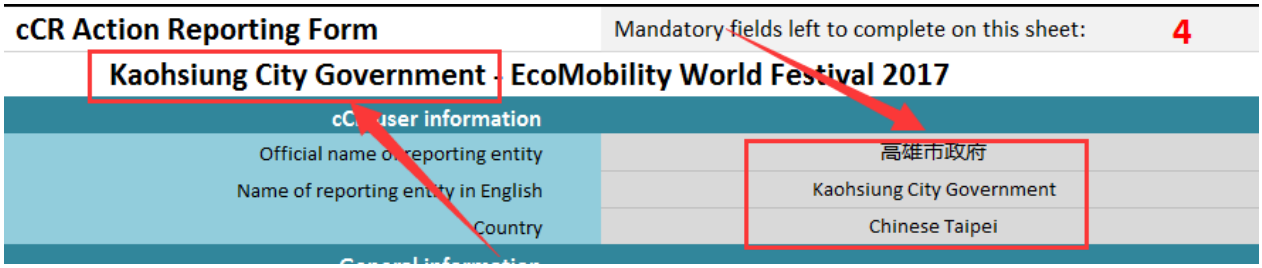
- Waste: Emissions through aerobic or anaerobic treatment of waste and waste water. Please note that emissions from energy consumption at waste treatment facilities are reported under "Energy related emissions from commercial and institutional buildings and facilities" energy- "other facilities".
- Other emissions: sum of GHG emissions from other sources, includes
  1. Other scope 3 emissions: any other emissions occurring outside the geographic boundary as a result of city activities
  2. Fugitive emissions: fugitive emissions released in the process of generating, delivering, and consuming useful forms of energy.

Please report emissions in each sector in tons CO_2 equivalent including CO_2, CH_4 and N_2O (except the F-Gases field where you can report on any HFC, PFC, SF_6 gases). All entries should indicate the sum of GHG emissions (tCO_2e) from Scope 1 and Scope 2, unless otherwise stated.

How to report the "Action "sheet? (watch the tutorial video)

In this Actions sheet, users report climate change mitigation and adaptation action. If you have an action plan, please report it in the "action plan" sheet. For the difference between action and action plan, please visit relevant section "What is the difference between action and action plan?"

Open the sheet, you will see the official name of the reporting entitys, English name for the reporting entity and the country name are pre-populated. If you do not see this information pre-populated, you might use an outdated reporting form. Please log-in to your account for the correct reporting sheets.



1. Action title

Please first input your action title. The title will be displayed on the city profile page as the identification of this action. A strong and attractive action title is short and informative. Usually a title includes the city's name and the main activity.

2. Summary

Please provide a general summary of the reported action. Your summary is particularly important for initiatives supported by the cCR, such as the WWF One Planet City Challenge, the EcoMobility Alliance and the Compact of Mayors. Reporting complete and comprehensive **summaries in English is crucial** for public to understand your report.

Tips for a strong summary:

- write your summary in English
- describe the action taken in detail, especially the intended outcomes
- describe in a few sentences the contents of the supporting document you have included to help us get a sense of the information you have provided and why it is important

Please note the reporting of at least one action is required by the Compact of Mayors and WWF One Planet City Challenge.

3. Action Type:

Please indicate the type of activity of the reported action. You can find the definition of each action type by hovering your mouse over the information box.

• Policy / Strategies/ Action Plans are comprehensive plans made by reporting entities. For example, Low emission development strategies, Climate Adaptation Strategies, a Plan for the integrated management of water resources, Cycling Plan, Food Security and Urban Agriculture Strategy, etc…

• Regulations are the publication of regulations, rules or guidance. For example, regulatory municipal building codes, municipal regulations on waste management, green procurement rules, energy labelling and certification schemes, etc…

• Technical / Infrastructure investments are implementable projects. For example, all technical and technological actions, from project design to construction and the installation of materials, equipment, and facilities, the replacement of electric boilers with biomass boilers, installation of solar panels, electric vehicles fleet and charging stations, bicycle lanes, etc…

• Fiscal / Financial mechanisms are non-regulatory policy incentives which facilitate the financing of climate actions. For example, a Public-Private-Partnership contract to secure funding; sponsoring from the private sector, concessions, energy performance contracts, municipal cap-and-trades, loans, subsidies, etc...

• Organizational / Governance actions are the application of operational procedures for municipal infrastructure and assets. For example the application of an Environmental Management System (ISO 14001), energy management system (ISO 50001) of municipal operations, or a maintenance plan for AC systems in public buildings, etc…

• Education / Awareness Raising actions aim to raise awareness for the general public and other target groups. For example, a communication campaign, pilot-projects for demonstration purposes, or special events or initiatives, such as “walk to work week”, power-saving campaigns, promotion of water-saving techniques, etc…

• Assessment and Research actions aim to conduct research to assess climate related issues. For example, Climate-Change Vulnerability and Adaptation assessments, Arboreal Health Monitoring, Sea Level Rise Adaptation Study, Housing Energy Rehabilitation Survey, an energy audit of the local government buildings and facilities, assessment of the impacts of alternative policies to the community, monitoring activities such as GHG emission inventories.

• Public Participation / Stakeholder engagement actions which actively engage citizens and other stakeholders. For example, public hearings and workshops to include inputs from citizens and/or specific stakeholder groups, bilateral meetings with associations of professionals or business sectors, as “multiplier” organizations.

4. The climate focus:

Is your action focusing on reducing greenhouse gases emissions(mitigation)? Or on adapting to the climate change impacts(Adaptation)? Or both? Please choose the climate focus from the dropdown box here. The definition can be find in the information box.

- Mitigation action (an action which focuses purely on GHG emission reductions)
- Mitigation action with a secondary focus on adaptation
- adaptation action (Purely focusing on adjustments to natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities)
- Adaptation actions with secondary focus on mitigation

5. Boundary and the scope of impacts

As in other reporting sheets, the cCR reports commitment(s), performance(s) and action(s) with differentiated boundaries, either at the Community or Government operations level. You can find the definition of boundaries and the scopes of impact in the information box. Please note that the choice of boundary changes the required items of impact scope. The boundaries differ as such:

- **Community** commitment/performance/action: applies to **all activities occurring throughout your local or subnational government’s entire geographic area**.

- **Government** commitment/performance/action: applies to **activities limited to the local government’s administrative operations** (e.g. government owned buildings or facilities (street lighting, waste/wastewater treatment plants), as well as government staff training and capacity building).

Based on the boundary chosen, the cCR requires the user to further clarify the impact scope:

- ✓ Please indicate where the **community action is taking place**, and the area on which it is most likely to impact:

• In-boundary action with in-boundary impacts: The action and its impacts take place within the city or region's geographic boundary. This type of action only includes actions that lead to scope 1 emission reductions (e.g. building retrofit projects within the city/regional boundary which aim at improving energy efficiency in buildings and reducing fossil fuel consumption only, or a climate education program for citizens.)

• In-boundary action with transboundary impacts: implies the action and its impacts take place within the boundary; however, it has impacts beyond the city/regional geographic boundary. This type of action includes actions that lead to scope 1, scope 2 and scope 3

emission reductions, such as a waste management plant treating city/regional waste, as well as waste from the surrounding area, building efficiency projects leading to the reduction of grid electricity consumption.

• Transboundary action: This means the action is Not ONLY taking place within city/regional boundary and has impacts beyond the boundary. Such actions may include carbon offsetting by purchasing emission credits, the prevention of use/purchase of exported goods and services, as well as transboundary transport.

✓ Please indicate where the local **government operation** take place and where it will have the highest impact:

• Local government operations: the influences of the action only apply to the local government.

• Trans-boundary and city-to-city partnership: the action influence applies to other local governments

6. Current development status of the action

Please indicate the status of the reported action:

• **Planning**: the action is in the assessment, planning, or fund-raising phase. No implementation is carried out yet at this phase.

• **Under construction or set up**: The action planning is concluded. A series of preparation activities are carried out for yielding outcomes of the activity. This phase includes actual construction of infrastructure. Stakeholder consultation, training and awareness raising activities.

• **In operation**: The preparation phase is concluded. The action is being carried out and yielding designed outcomes. This phase includes operation of renewable energy plants, conducting trainings, implementing policies and strategies, etc.

• **Completed**: the action has already yielded GHG emission reductions, or adaptation benefits.

7. Action approval year

Year in which the action is approved by the council or mayors' office

8. Anticipated impact delivery year

Year in which the action will deliver intended impact, such impact includes mitigation impacts of reducing GHG emissions; adaptation impacts, such as alleviating risks and vulnerabilities;

9. Please upload action report and action image

The report and image will be linked and displayed on the city profile.

Please indicate the name and the format of the document on the reporting sheet, and then submit the file together with the reporting form via email to carbonn@iclei.org

10. Relations to other levels government

Please indicate this action's relationship to other levels of government's activities.

By indicating if this commitment is required by or required to other level government, we can link your actions to actions at other levels of government for enhanced vertical integration.

11. Contact detail

If possible, please provide the contact person for the action. We will keep your contact information confidential and only use for the recommendation of financial, case study and publication opportunities to celebrate or accelerate your achievements.

12. Multiple governance

Please indicate this action's relationship to the activities of government from other levels.

By indicating whether your action is a requirement by government from other levels, we can in turn vertically link and integrate actions from different administrative levels.

13. Financial information

Please indicate the total budget of the action. How many of the total budget is financed from the local government? What is the primary financial source of the action? What is the status of the action in securing finance resources?

This information helps us to identify the financial sources and financial development status. We might use this information to connect your action to potential founders.

14. Action impacts in job creation, mitigation and adaption

In cCR we collect the action impacts information from three aspects: Job creation, mitigation and adaptation.
Please indicate the number of job created within action period and remain afterwards in row 38 and 39.
Please indicate the mitigation sectors and impact area (valid for both mitigation and adaptation) in the tick boxes.
Please choose the major methods of mitigation from the dropdown list.
Please indicate the renewable energy sources used within the action.
Lastly, please indicate the direct Greenhouse gas emission reduction impact within the action period and afterwards.

If the action is not yet completed, please insert anticipated impacts according to the action planning documents.

Don't for get to update your profile, once the action is completed. This information helps us to connect your action to relevant initiatives, trainings, tools and potential collaboration opportunities.

15. Co-benefits

Besides mitigation and adaptation, we understand that the local action bears more responsibilities and impacts to the society. Please indicate the co-benefits, your project aims to deliver with the tick boxes.

How to report the "Adaptation and Resilience "sheet?

The adaption and resilience section is based on Climate Risk and Adaptation Framework and Taxonomy (CRAFT) guide 4.2 Module 2. Please find the full CRAFT guidance in the Annex. 1

Annex 1. **Climate Risk and Adaptation Framework and Taxonomy**

C40 Cities

Questionnaire Guidance

Interim issue v3.0 |

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Background to this document

CRAFT is a standardized reporting framework that enables cities to perform robust and consistent reporting of local climate hazards and impacts, risk and vulnerability assessment, and adaptation planning and implementation as part of their compliance with the Compact of Mayors. CRAFT was developed for cities by cities, their networks, and the organizations that serve them.

This document provides additional instructions and background information for city respondents completing the CRAFT questionnaire. The content of this document is intended to be incorporated by CDP Cities (CDP) or carbon*n* Climate Registry (cCR) into their existing guidance documentation to provide cities with a seamless experience between CRAFT and non-CRAFT questions when reporting.

This document follows the structure and style of the CDP Cities 2015 'Guidance for responding city governments', Version 1.1, current as of February 23, 2015, the CDP Cities 2015 Information Request for the Compact of Mayors (Compact), and the cCR 'October 2014 User Manual for cCR version 4.1'.

The information in this document can be used to provide 1) inline guidance within the reporting platforms and 2) detailed guidance that can be integrated into both CDP and cCR user guides.

The document is structured in four parts:

- **Part 1:** provides an overview to the CRAFT questionnaire.
- **Part 2:** provides inline and detailed guidance for each of the CRAFT questions.
- **Appendix A:** provides guidance for CRAFT questions that are currently not included in CDP or cCR reporting platforms. These questions were developed to enable further reporting on city experiences of climate adaptation planning and implementation, but are currently not required for reporting by Compact participants. These questions may be incorporated into the CDP Cities, cCR, or other reporting platforms in the future, or completed by the C40 team through post-processing data analysis.
- **Appendix B:** provides a glossary of key terms used within the CRAFT questions or guidance.

Contents

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Part 1: Overview to CRAFT

This section provides an overview to the purpose and components of the CRAFT questionnaire.

It provides context and high-level language about CRAFT that CDP and carbonn Climate Registry can incorporate into their own guidance and/or communications documentation.

Overview of the CRAFT Questionnaire

Purpose of CRAFT

CRAFT is a standardized reporting framework that enables cities to perform robust and consistent reporting of local climate hazards and impacts, risk and vulnerability assessment, and adaptation planning and implementation as part of their compliance with the Compact of Mayors.

It establishes a platform for city officials to report the unique conditions faced by their cities and their planning responses. CRAFT was developed for cities by cities, their networks and the organizations that serve them through a process of desktop research and stakeholder engagement.

Cities can access the CRAFT reporting framework through CDP Cities and the carbon*n* Climate Registry. These platforms allow cities to share the status of their climate adaptation planning efforts.

CRAFT provides city officials and their partners:

- a framework for cities to perform robust and consistent reporting of climate hazards and associated adaptation planning and implementation that is required by the Compact of Mayors;
- a means to monitor and evaluate adaptation planning progress to help cities improve adaptation efforts by enhancing knowledge of best practices;
- a means for cities to identify priorities and target advocacy for climate adaptation resources; and,
- the data to improve the ability for cities and their partners to identify peers and aspirational examples to help inform their own adaptation planning process and implementation.

Ultimately, the data collected through CRAFT will facilitate knowledge sharing and collaboration at the local level, thereby improving, accelerating, and transforming the development and implementation of urban adaptation strategies.

1.1.1 CRAFT and The Compact of Mayors

The Compact of Mayors is the world's largest coalition of city leaders addressing climate change by pledging to reduce their greenhouse gas emissions, tracking their progress and preparing for the impacts of climate change.

Launched at the 2014 United Nations Climate Summit, the Compact requires participating cities to report annually on their progress towards meeting climate commitments related to both mitigation and adaptation.

CRAFT will be the standard for cities to report key aspects of their adaptation actions and experiences of climate risk, and will be administered under the banner

of the Compact of Mayors and through its partner reporting platforms, CDP Cities and the carbon*n* Climate Registry.

The data collected through CRAFT inform ongoing processes surrounding the Compact. The data disclosed will improve communication of the key aspects of climate adaptation planning for member cities, and enable insights into best practice as well as barriers to planning and actions cities have taken to overcome these challenges.

Structure and Components of CRAFT

CRAFT is comprised of three reporting modules:

- **Module 1: Profile the City**
  Covers basic socio-economic and governance characteristics.
- **Module 2: Understand the Problem**
  Covers the climate risk and vulnerability assessment processes, current and future climate hazards, impacts and adaptive capacity.
- **Module 3: Plan, Respond and Monitor**
  Covers adaptation planning and implementation.

An overview of the main reporting areas in each CRAFT module can be found in Table 1 on the following page.

TABLE 1: CRAFT DATA REPORTING AREAS

Profile the City	Understand the Problem	Plan, Respond and Monitor
Geographic characteristics	Vulnerability assessment process	Adaptation planning
Socio-economic characteristics	Climate hazards and impacts	Adaptation goals
Governance / city budget characteristics	Climate change impacts	Adaptation actions
	Adaptive capacity	Barriers and opportunities

Instructions for completing CRAFT [specific to CDP]

Within the CDP Cities reporting platform, the CRAFT questions are accessible in two ways: 1) as questions integrated into the main reporting body of the CDP reporting platform and 2) as a separate download file specific to C40 cities and cities reporting in compliance with the Compact of Mayors.

C40 Cities and cities reporting to the Compact of Mayors through the CDP Cities platform are instructed to download, complete, and upload the separate download file through Question 3.3a of the CDP Cities Information Request.

Part 2: Guidance for respondents completing the CRAFT questions

This section provides inline and detailed guidance for respondents completing the CRAFT questions.

This content is available for CDP and the carbon*n* Climate Registry (cCR) to incorporate into their existing guidance.

Within the CDP Cities platform, a selection of the CRAFT questions have been identified to comprise a separate module for respondents to download, complete, and upload to the CDP platform. These questions are tagged in the guidance below with the note '**CDP Download**' in brackets, with numbers identifying their order within the Compact module (e.g. 'CDP-Download – 1.2').

Module 1: Profile the City

This module collects data on general city characteristics that influence resilience, and adaptation planning and implementation. The purpose of this information is to understand the context within which city adaptation planning and action is occurring. Reporting fields in this module relate to geographic, socio-economic and governance / city budget characteristics.

Geographic characteristics

This section asks respondents about the administrative area managed by the reporting jurisdiction.

1.0 Please describe your jurisdiction.

Administrative boundary
Identify the administrative boundary of your jurisdiction by selecting the most appropriate response from the following list of values:

- City / Municipality – a city, town, village or borough, etc. with some degree of general-purpose self-governance.
- Local government area within a city / metropolitan area – a sub-tier of local government responsible for local services not overseen by the executive governing body (e.g. the City of London local authority within the Greater London Authority).
- Independent city – a city or town that does not form part of another local government entity (e.g. cities within U.S. States that are independent from county-level government such as Baltimore, Maryland or Carson City, Nevada; the German *Kreisfreie Städte* or *Stadtkreise* such as Leipzig and München).
- Special city – cities or districts with special administrative status as compared to other similar urban areas (e.g. Seoul, South Korea; Kiev, Ukraine; Hong Kong Special administrative region).
- Federal district – a type of administrative division of a federation under the direct control of a federal government (e.g. Brasilia, Brazil; Washington, District of Columbia, USA; México, Distrito Federal, Mexico).
- Sovereign city-state – a state consisting of a sovereign city and its dependencies (e.g. Singapore; Vatican City).
- Metropolitan area – a region consisting of a densely populated urban core and its less-populated surrounding areas (e.g. an urban area closely linked economically and socially, such as a commuting catchment area).
- County – a geographical region that forms a subnational or sub-state division of governance that may include a number of cities, town, villages, etc. (e.g. Northumberland, UK).
- Other area

Description of jurisdiction and regional setting
Provide further clarification about the answer you have provided for the previous question. Briefly describe (250 words or less) the size of your jurisdiction and what falls within your control. You can also provide more information about the regional context, relationships with surrounding jurisdictions or the next level of government.

The purpose of this question is to gain a better understanding of the scope of your jurisdiction's administrative responsibility.

Questions in further modules will address the areas covered by your jurisdiction's climate change vulnerability assessment and adaptation plan. This question therefore also provides baseline information, which when combined with these later questions provides insight into how climate adaptation planning aligns with administrative boundaries.

Socio-economic characteristics

This section asks respondents about the socio-economic characteristics of their jurisdiction, particularly focusing on GDP and population.

1.1 Please provide details of your GDP.

Provide information about your jurisdiction's gross domestic product (GDP). The OECD defines the GDP for a jurisdiction as a measure of "final goods and services produced… during a period minus the value of imports".[1]

GDP (value)
Provide the most current value available of your jurisdiction's gross domestic product in your local currency, or the currency used for calculation.

Currency of GDP
From the list of currencies provided, select the currency of the GDP value reported.

Year of GDP
From the list of values, select the year when the GDP value you are reporting was calculated.

Source
Indicate the party responsible for performing the GDP calculation. For example, was GDP calculated by staff within your city government or was it calculated by your national government, a consultancy or international agency? Please elaborate on which reference was used, if any.

[1] OECD, Domestic product. https://data.oecd.org/gdp/gross-domestic-product-gdp.htm

GDP is an important indicator of overall economic activity, which provides contextual information that could be relevant to the adaptation activities engaged in by your jurisdiction. Although GDP provides only a limited measure of wellbeing and material living standards, it nonetheless can be helpful in understanding the opportunities or limitations that a local jurisdiction may face in adapting to climate change.

1.2 Please provide details of your current and projected population.

Provide the current population of your jurisdiction, and indicate how your population is projected to grow in the future.

Current population
Provide the current population of your jurisdiction, the number of residents within your administrative area [as reported in question 1.0] as a whole number.

Current population year
Select the year in which the population figure was determined from the list of values provided.

Projected population
Provide the projected population of your jurisdiction as a whole number; the following reporting field enables you to identify the timeframe for which the population projection was calculated. Local governments regularly use population projections for land-use planning purposes and it is likely that those who manage urban planning within your jurisdiction will have these figures.

Projected population year
Use the drop-down list provided to select the year that most closely represents the timeframe in which the projected population figure stated in the previous field will be reached.

This information enables the calculation of overall population density, both current and projected. Population and population density can be important in adaptation planning, as these metrics can be used to assess the number of persons exposed to specific climate hazards and can provide an indication of the scale of impacts and response potentially faced by your jurisdiction.

Governance / city budget characteristics

This section asks respondents to describe their jurisdiction through a set of questions relating to characteristics of governance and city budget.

1.3 Please provide information about your jurisdiction's leader.

This question asks for details about your jurisdiction's leader (Mayor, Governor, etc.), including their time in office.

Leader title
State the official title of your jurisdiction's leader.

Leader name
State the full name of your jurisdiction's leader.

Current term start
Provide the date that your leader began his or her current term in office. Only provide an answer for the current term, even if your jurisdiction's leader has held office for multiple terms; a later reporting field enables you to report the total time in office served by your jurisdiction's leader.

Current term end
Provide the date that your leader's current term in office will end. The end of term is defined by the date when the process to select a new leader (or renew the current leader's mandate) is scheduled to occur. If there is no scheduled end of term for your jurisdiction's leader, please leave blank.

Total time in office (years)
Provide the total number of years that your jurisdiction's leader has been in office.

These questions are asked in order to gain insight into the length and continuity of local leadership. Research has shown that these qualities can affect the ability of a jurisdiction to undertake climate adaptation planning and successfully implement adaptation actions.

1.4 Please describe the administrative structure of your jurisdiction. [CDP Download – 1.0]

This question asks for details about your jurisdiction's administrative structure.

Administrative structure
Identify the type of administrative structure under which your jurisdiction operates. The available responses in the drop down menu include:

- One-tiered – a jurisdiction with one level of local government, such as a unitary authority, responsible for all public administration functions within its jurisdictional area.
- Multi-tiered – a jurisdiction with multiple interacting authority structures responsible for local governance.
- Pluralized – non-hierarchical governance shared between state and non-state entities

Description of administrative structure

Provide further clarification about the answer you have provided in the previous question. Briefly describe (250 words or less) the administrative structure of your jurisdiction and the administrative area within its control. You can also provide more information about the regional context, relationships with surrounding jurisdictions or the next level of government.

The purpose of this question is to understand your jurisdiction's administrative structure, as this can influence local capacity to undertake climate adaptation planning, or can affect the issues and sectors that are the focus of your jurisdiction's adaptation efforts.

1.5 Please provide details of your jurisdiction's annual operating budget. [CDP Download – 1.1]

This table question is to identify the amount of funding for your jurisdiction's annual operating budget and the time-period allocated.

The annual operating budget for a jurisdiction sets out proposed appropriations for a fiscal year to enable the jurisdiction to function, provide services, and meet financial requirements. The annual budget for a jurisdiction is typically comprised of several parts including: the expense budget, which sets out proposed appropriations for operating expenditures for municipal services; the capital budget and capital program, which establishes the appropriations for capital projects; and the revenue budget, which sets out the estimated revenues and receipts of the local government.

Annual operating budget (value)
Provide the value of your annual operating budget in your local currency, or the currency used for calculation.

Currency of operating budget
From the list of currencies provided, select the currency the annual operating budget reported.

Budget year start (From)
Select the starting year of the operating budget reported in the previous question.

Budget year end (To)
Select the closing year of the operating budget reported in the previous question.

Calendar month of budget year start
Select the calendar month in which your operating budget starts.

1.6 Please provide details of your jurisdiction's annual revenue sources. [CDP Download – 1.2]

This table question is to identify the source(s) of your jurisdiction's annual revenue and the percentage that each source contributes. Please add or delete table rows as needed for your entries.

Revenue Sources

Report the percentage of your jurisdiction's total annual revenue contributed by each of the relevant revenue source. Please selecting the most applicable responses from the following list of values or select the 'other' value to provide further description of a relevant source not include in the list:

- National / central government – money provided, including aid or loans.
- Regional / state / provincial government – money provided, including aid or loans.
- Local taxes – financial charge or other levy collected by the local government, such as taxes on income, sales, property, etc.
- Levies and fees – such as fees for the granting of permits, rents, concessions and royalties, or fines.
- Operational revenues – such as service or user fees paid to enterprises owned by the local government (e.g. waste management services, telecoms services, energy providers).
- Other

This question addresses your jurisdiction's budget and revenue sources, as these can be key determinants of the scale and types of adaptation actions that a local government is willing and able to undertake.

Module 2: Understand the Problem

This module contains reporting fields that allow the city to report on their vulnerability assessment process, climate risk and vulnerability faced now and in the future. It also explores the underlying factors within a city that can help or hinder adaptation. Reporting fields relate to climate risk or vulnerability assessment, climate hazards and impacts, climate change impacts and city adaptive capacity.

Assessment

This section asks respondents to describe the efforts of their jurisdiction to assess climate change risk or vulnerability.

Climate change refers to a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

A climate change risk and vulnerability assessment is used to determine the nature and extent of risks posed by climate change. This is done by analyzing potential future climate hazards and evaluating existing vulnerabilities to understand the seriousness of the potential impacts on people, assets, services, livelihoods and the environment.[2]

There are a variety of available methods for cities to assess climate risk and vulnerability. The questions in this section are designed to be applicable for reporting regardless of the specific approach your jurisdiction may have taken; the questions are not intended to replace any methodology or dictate a formal assessment approach.

2.0 Has your jurisdiction undertaken a climate risk or vulnerability assessment?

Indicate whether your jurisdiction has undertaken, or is in the process of undertaking a climate change risk or vulnerability assessment.

Risk or vulnerability assessment
Indicate the status of your jurisdiction's risk or vulnerability assessment by selecting one of the following responses from the drop down list:

- Yes – Assessment has been signed off and endorsed by leadership.

[2] UNEP – UNITED NATIONS ENVIRONMENT PROGRAMME. (2013) *PROVIA Guidance on Assessing Vulnerability, Impacts and Adaptation to Climate Change*. Nairobi: UNON/Publishing Services Section. Available from: http://www.unep.org/provia/Portals/24128/PROVIA_ guidance _report.pdf. [Accessed: 20th November 2015].

- In progress – Assessment is currently in progress or is waiting on endorsement by leadership.
- No – the jurisdiction has not embarked on effort to undertake a climate risk or vulnerability assessment.
- Not intending to undertake – the jurisdiction does not intend to undertake a climate risk or vulnerability assessment, now or in the future.
- Do not know

Boundary of assessment
Indicate the boundary of your jurisdiction's risk or vulnerability assessment by selecting the most applicable response from the following list of values:

- City / Municipality
- Local government area within a city / metropolitan area
- Independent city
- Special city
- Federal district
- Sovereign city-state
- Metropolitan area
- County
- Other area (coastal zone, central business district, etc.)

[NB: Please refer to Question 1.0 guidance for a full explanation of these terms.]

Primary author of assessment
Indicate who was predominately responsible for carrying out the risk or vulnerability assessment for your jurisdiction by selecting the most applicable response from the following list of values:

- Dedicated city team
- Relevant city department
- Consultant
- International organization
- Community group
- Regional / state / provincial government
- National / central government
- Other

[NB: A 'Dedicated city team' may be comprised of a team of people or a single person employed by the city government and assigned specifically to undertake the local climate risk and vulnerability assessment as a full time role. This reporting option is distinct from a staff person or team within a city department that may undertake the assessment from the perspective of their city department, rather than a citywide assessment, or departmental staff assigned to a citywide risk and vulnerability assessment on a part-time basis.]

Publication title

Indicate the official title of your jurisdiction's risk or vulnerability assessment.

Year of publication
Indicate the year that your jurisdiction's risk or vulnerability assessment was completed, or is expected to be complete.

Upload risk or vulnerability assessment
Click on 'Choose file', navigate to the file you want to upload and click 'Open'. Once you can see the file name in the text field click 'Attach & Save' to attach the document.

This question is asked to understand if, and when your jurisdiction has last carried out a climate change risk or vulnerability assessment. A climate change risk and/or vulnerability assessment is a critical step in the adaptation planning process, as it provides the information base upon which adaptation actions can be identified and prioritized. It is therefore important to report whether this information exists as part of the disclosure of your jurisdiction's adaptation planning process.

2.1 If applicable, please describe the scope of your jurisdiction's climate risk or vulnerability assessment. [CDP Download – 2.0]

Describe the content and detail of your jurisdiction's climate risk or vulnerability assessment by indicating the extent to which climate hazards, critical assets and vulnerable populations have been identified and assessed.

Please answer these questions for your most recent risk / vulnerability assessment, regardless of whether this is the first assessment your jurisdiction has carried out or if it builds on previous efforts. Question 2.2 provides the opportunity for you to describe your assessment process in more detail, including any previous efforts.

Climate hazards identified / mapped
Indicate the extent to which your assessment identified / mapped climate hazards by selecting the most applicable response from the following list of values:

- City has not conducted a climate hazard assessment.
- City has assessed the most frequent hazards (standalone) – for example a sea level rise assessment or a heat wave assessment.
- City has conducted a multi-hazard assessment – city has considered the effect of multiple hazards on the city.
- City has conducted a multi-hazard assessment that includes cascading hazards – city has considered the effect of multiple hazards on the city including how the occurrence of one may affect that of the other, such as a positive relationship between storms and flooding, in which increasing intensity or

frequency of storm events may also increase the occurrence or magnitude of flooding.

Climate hazards are dangerous climate-related physical events 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.

Examples of types of hazards include: storms; extreme temperature (cold); extreme temperature (hot); water scarcity; wild fire; flood; sea level rise; wave action; chemical change (e.g. aquatic or atmospheric conditions); mass movement; insects and microorganisms.

Critical assets identified / mapped

Indicate the extent to which your assessment identified / mapped critical assets by selecting the most applicable response from the following list of values:

- City has not considered critical assets
- City has considered some critical assets
- City has considered all critical assets
- City has considered all critical assets, including interdependencies (i.e. such as assessing how a failure in one asset may affect other assets such as damage to the electricity network affecting the transport system).

Critical assets are assets, systems and services that are essential to the functioning of a society and economy.

Examples of critical assets include energy; water supply & sanitation; transport; waste management; information & communications technology; food & agriculture; environment; industrial; commercial; residential; education; public health; community & culture; law & order; and emergency management assets, systems and services.

Vulnerable populations identified / mapped

Indicate the extent to which your assessment identified / mapped vulnerable populations by selecting the most applicable response from the following list of values:

- City has not considered vulnerable populations
- City has considered some vulnerable populations
- City has considered all vulnerable populations
- City has considered all vulnerable populations, including interdependencies

Vulnerable populations include individuals or groups of people who are less able than the general population to anticipate, cope with, resist and recover from the impacts of disasters.

Vulnerable populations may be described by race or ethnicity, culture, socio-economic status, geography, gender, disability, and age, or other characteristic, and may be disproportionally likely to be affected by climate hazards.

This question is asked in order to understand the scope of what your jurisdiction's climate change risk or vulnerability assessment has covered, and the level of detail and complexity of this coverage. Climate change adaptation is an iterative process; often, a city will undertake more complex analysis as it progresses through these iterations. A more simple analysis can be equally effective if it meets the needs of the decision-making purpose for which it will be used.

2.2 If applicable, please describe the update / revision process for your jurisdiction's climate risk or vulnerability assessment. [CDP Download – 2.1]

Indicate whether your jurisdiction has established an approach for updating / reviewing its climate risk or vulnerability assessment and describe the update / revision process, including the number of years between formal updates if applicable and the status of current updates / revisions.

Formal schedule for update
Indicate if your jurisdiction has established a schedule for updates or revisions to its climate risk or vulnerability assessment by selecting 'Yes', 'No' or 'Do not know' from the drop down menu. A formal schedule implies that updates or revisions to the assessment are completed at regular, predefined intervals of time.

If yes, what is the time period for update (years)
This question only applies if you have selected 'Yes' to report that your jurisdiction has a formal schedule for updates or revisions to its climate risk or vulnerability assessment. Indicate the number of years between updates or revisions to your jurisdiction's climate risk or vulnerability assessment.

If no, or do not know, do you have an alternative update schedule or trigger?
This question only applies if you have selected 'No' or 'Do not know' to the previous question regarding a formal schedule for updates or revisions to your jurisdiction's climate risk or vulnerability assessment. If your jurisdiction follows some other approach for updates or revisions to its climate risk or vulnerability assessment, please provide a brief description (100 words or less) of this approach. Other approaches may include *ad hoc* updates based on the availability of new information, updates due to a major disaster event, or updates driven by political terms.

Status of current update
If applicable, indicate the status of updates or revisions to your jurisdiction's climate risk or vulnerability assessment by selecting one of the following values:

- Completed

- In progress
- No
- Not intending to undertake
- Do not know

Number of times previously updated
If applicable, indicate the total number of times your jurisdiction's climate risk or vulnerability assessment has been previously updated or revised.

[NB: This question seeks to identify the number of times your jurisdiction has undertaken an update to its climate risk and vulnerability assessment, separate from an initial assessment. This may include partial updates to address individual risk areas, annual monitoring / progress reports, or a full comprehensive update.

For example, you may have selected 'In progress / incomplete' above to report that your jurisdiction has begun to revise its climate risk or vulnerability assessment, and this current work represents an update to a previous, initial assessment. If no previous updates have been undertake n, excluding the initial assessment, please report '0' in this field.

As another example, you may have selected 'In progress / incomplete' above to report that your jurisdiction has begun the fourth annual revision to its climate risk or vulnerability assessment. In this case, you would report '3' in the field for number of previous updates, as the number of updates excludes both the initial assessment and current work in progress.]

The purpose of this question is to understand how your jurisdiction plans to update its risk or vulnerability assessment. As previously mentioned, climate adaptation is an iterative process. Our climate will continue to change indefinitely, and the risks faced by your jurisdiction will likewise continue to evolve. Therefore, it is useful to have an established process for regularly reviewing and revising your jurisdiction's risk or vulnerability assessment.

BOX 1: OVERVIEW OF STEPS IN CLIMATE RISK OR VULNERABILITY ASSESSMENT

What are the steps in a climate risk or vulnerability assessment?

Before developing an adaptation plan, it is important to understand how climate change is likely to affect your city - this is usually done by conducting a climate change risk or vulnerability assessment.

A vulnerability assessment is the analysis of the expected impacts, risks and the adaptive capacity of your city to the effects of climate change. Assessing the vulnerability of your city encompasses more than simple measurement of the potential harm caused by events resulting from climate change: it also includes an assessment of the region or sector's ability to adapt, sometimes referred to as 'adaptive capacity'.

In order to complete a vulnerability assessment, a city is likely to need to undertake the following steps:

- Decide the purpose and scope of your risk of vulnerability assessment
- Collect relevant data such as
    - Geographic and political information
    - Land-use and population demographics
    - Critical asset location, condition, connections and management
    - Current and historical climate information

Understanding the current and future climate hazards faced by your city requires several steps:

- Identifying the hazards to which your city is (or has historically been) exposed
- Assessing the consequence and likelihood of the impact of these hazards on your city based on recent, expert-reviewed estimates where possible
- Selecting climate change scenarios outlining possible future climate in the city
- Understanding how the frequency and intensity of climate hazards will change under these scenarios

Understanding your city's exposure and sensitivity to climate hazards, and your capacity to adapt, requires several steps:

- Assessing previously identified current and future hazard exposure usually under two (or more) climate change scenarios
- Identifying the city's critical assets and the relationships between them
- Identifying likely impacts from current and future hazards on the city's critical assets
- Identifying strengths and weaknesses of the city's adaptive capacity
- Assessing the vulnerability of the city, based on the combination of the possible impacts of climate change and the city's adaptive capacity

A high quality vulnerability assessment involves engagement with a broad range of stakeholders. It is important to recognize the diverse expertise that different stakeholders provide. It is particularly critical to acknowledge local community and traditional indigenous knowledge and to be aware of different perspectives and values. Broad engagement can result in identification of previously overlooked areas of vulnerability or in a more nuanced understanding of the root cause of vulnerabilities and hence better-targeted adaptation responses.

Please reference the glossary for more explanation of key terms.

Current and future climate hazards

This section asks respondents to identify the significant city climate hazards currently faced by their jurisdiction today, as well as to describe how they expect climate change to affect these hazards in the future. This section seeks to understand the challenge faced by cities due to climate change. The data collected in this section can also help to match respondents with similar conditions today, and to help cities and their partners identify peers who may be experiencing hazards today that they may face in the future.

City climate hazards refer to climate-driven phenomena that may cause loss of life, injury, or other health impacts to city populations, as well as damage and loss to the urban systems on which they depend.

Climate impacts are a result of the effects of these hazards (extreme weather and climate events) on natural and human systems. Impacts generally refer to effects on lives, livelihoods, health status, ecosystems, economic, social, and cultural assets, services (including environmental), and infrastructure due to the interaction of climate changes or hazards occurring within a specific time period and the vulnerability of an exposed society or system.

Identifying climate change hazards and their impacts are critical steps in undertaking a climate change risk or vulnerability assessment.

[NB: CRAFT builds on earlier work undertaken by Arup, with support from C40, to develop a shared classification system for key climate hazards that cities are facing, known as the City Climate Hazard Taxonomy. For further insight into the research behind the Taxonomy, please refer to the full research report available from www.c40.org and www.arup.com.]

2.3 Please identify the most significant climate hazards currently faced by your jurisdiction. Indicate the CURRENT probability of occurrence and POSSIBLE consequence for each.

This table question is to identify climate hazards that your jurisdiction currently experiences, and the probability and anticipated consequence of their impact. An example response has been provided in Box 2 below.

Current hazards
Indicate the climate hazards that your jurisdiction CURRENTLY experiences (i.e. without the effect of climate change). It is only necessary to select the most significant hazards that your jurisdiction experiences. Please add or delete table rows as needed for your entries.

[NB: Please select the most significant hazards in accordance with your jurisdiction's understanding of significance.]

Climate hazards can be selected from the following list of values:

- Rain storm
- Monsoon
- Heavy snow
- Hail
- Severe wind
- Tornado
- Cyclone (Hurricane / Typhoon)
- Extratropical storm
- Tropical storm
- Lightning / thunderstorm
- Fog
- Extreme winter conditions
- Cold wave
- Extreme cold days
- Heat wave
- Extreme hot days
- Drought
- Forest fire
- Land fire
- Flash / surface flood
- River flood
- Coastal flood
- Groundwater flood
- Storm surge
- Permanent inundation
- Salt water intrusion
- Ocean acidification
- Atmospheric CO_2 concentrations
- Landslide
- Avalanche
- Rockfall
- Subsidence
- Water-borne disease
- Vector-borne disease
- Air-borne disease
- Insect infestation

More information about each climate hazard can be found in the Glossary provided in Appendix B.

Indicate the risks of potential impacts that these current climate hazards present for your jurisdiction:
A risk assessment involves assessing the probability (or likelihood) of the impact occurring, and the consequence (or magnitude) of the impact should it occur.[3]

Climate hazards resulting in impacts that are highly likely to occur, and which would have serious consequences for your jurisdiction should be considered high risk, high priority hazards. Likewise, climate hazards that result in insignificant impacts with a low probability of occurrence should be considered low risk, low priority hazards. While hazards with a low probability of occurrence and a high consequence of impact can result in significant one-time losses, the cumulative impacts of moderate hazards with a high probability of occurrence can produce equally damaging results.

Probability of hazard

[3] UKCIP. (2015) *Future climate vulnerability.* [Online] Available from: http://www.ukcip.org.uk/wizard/future-climate-vulnerability/#.Vknlr3bhBhF. [Accessed 16th November 2015].

Indicate the likelihood of each climate hazard identified in the first column occurring WITHIN THE NEXT FIVE YEARS. If possible, this response should be based on the outcome of a risk or vulnerability assessment process, although qualitative descriptors are used for reporting. Select the response that most appropriately represents the probability of the each climate hazard from the following list of values:

- High – Extremely likely that the hazard will occur (e.g. greater than 1 in 2 chance of occurrence over the next five years)
- Medium high – Highly likely that the hazard will occur (e.g. between 1 in 2 and 1 in 20 chance of occurrence over the next five years)
- Medium – Likely that the hazard will occur (e.g. between 1 in 20 and 1 in 200 chance of occurrence over the next five years)
- Medium low – Somewhat likely that the hazard will occur (e.g. between 1 in 200 and 1 in 2,000 chance of occurrence over the next five years)
- Low – Not likely that the hazard will occur (e.g. between 1 in 2,000 and 1 in 20,000 chance of occurrence over the next five years)
- Do not know

[NB: Many hazard risk assessments express risk in terms of annual probability (i.e., there is a 1 in 100 (1%) annual probability that hazard X of Y intensity will occur). If your jurisdiction has identified hazard probability in terms of annual probability, please divide the denominator by 5 to calculate the probability over five years. For example, a 1 in 100 (1%) annual probability is equivalent to a 1 in 20 (5%) chance over a 5-year period (i.e., 100 / 5 = 20). In the list of values above, a 1 in 20 probability is considered to be a 'medium high' probability of occurrence.]

Consequence of hazard

Indicate the consequence of possible impacts of each climate hazard identified in the first column on your jurisdiction within the next five years. If possible, this response should be based on the outcome of a risk or vulnerability assessment process, although qualitative descriptors are used for reporting. Select the response that most appropriately represents the consequence of climate hazard impacts from the following list of values:

- High – The hazard represents the highest level of potential concern for your jurisdiction. You anticipate that should it occur, the hazard would result in extremely serious impacts to your jurisdiction and catastrophic interruption to day-to-day life.
- Medium high – The hazard represents a high level of potential concern for your jurisdiction. You anticipate that should it occur, the hazard would result in serious impacts to your jurisdiction and interruption to day-to-day life.
- Medium – The hazard represents a medium level of potential concern for your jurisdiction. You anticipate that should it occur, the hazard would result in impacts to your jurisdiction, but that these would be moderately significant to day-to-day life.

- Medium low – The hazard represents a lower level of potential concern for your jurisdiction. You anticipate that should it occur, the hazard would result in impacts to your jurisdiction, but that these would be less significant to day-to-day life.
- Low – The hazard represents the lowest level of potential concern for your jurisdiction. You anticipate that should it occur, the hazard would result in impacts to your jurisdiction, but that these would be insignificant in day-to-day life.
- Do not know

This question is asked because it is useful for establishing a baseline for the climate hazards and risks faced by your jurisdiction. This information provides important context for the future hazards that your city will face due to climate change. The identification of current climate hazards can also be a useful first step in developing a more comprehensive understanding of how your jurisdiction is likely to be affected by climate change.

BOX 2: EXAMPLE REPORTING OF CURRENT CLIMATE HAZARDS

Example: Imagined climate hazards faced by a tropical coastal city

The theoretical city used for this example experiences frequent surface and river flooding during heavy rain storms due to large areas of impervious surface cover and an outdated storm sewer system. These storms occur primarily in winter months and while frequent, they do not significantly alter day-to-day life across the city but tend to affect localized areas with frequent low-level losses from economic, environmental and social impacts that create cumulative challenges for the local area.

While infrequent, coastal flooding can also occur when heavy rain combines with high tides. These events cause widespread damage to waterfront areas and the cost of recovery is high.

Conversely, the city typically experiences periods of drought during summer months when temperatures are high and rainfall is low. Although also a part of city life, particularly long periods of drought can severely affect local businesses and residents through water use restrictions and public health impacts.

The table below provides an example of how this theoretical city would report its current climate change hazards.

Current hazards	Probability of hazard	Consequence of hazard
Rain storm	High	Low
Coastal flood	Medium high	High
Drought	Medium low	High

2.4 Please identify how you expect climate change to affect the frequency and intensity of the hazards you face, and when you FIRST expect to experience those changes.

This table question is to assess how your jurisdiction expects climate hazards to change in the future due to the effects of climate change. Responses should be reported in the table provided using the drop down menus where appropriate. Please refer to the example in Box 3 for more detail.

Your climate change risk or vulnerability assessment should provide guidance as to how climate change is expected to affect climate hazards. Other possible resources for reporting this information include national climate change projections or reports by the Intergovernmental Panel on Climate Change (IPCC).[4]

Future hazards
Indicate the climate hazards that your jurisdiction expects to face IN THE FUTURE. It is only necessary to select the most significant hazards that your jurisdiction expects to experience in the future. Please add or delete table rows as needed for your entries.

[NB: Please select the most significant hazards in accordance with your jurisdiction's understanding of significance.]

Change in frequency
Indicate the expected change in frequency of climate hazards in your jurisdiction based on the following list of values:

- Increasing – climate change will cause the hazard to occur more frequently in the future.
- Decreasing – climate change will cause the hazard to occur less frequently in the future.
- None – climate change will have a negligible effect or no effect on the frequency of hazards.
- Do not know

Change in intensity
Indicate the expected change in intensity of climate hazards in your jurisdiction based on the following list of values:

- Increasing – future hazards will be more intense as a result of climate change.
- Decreasing – future hazards will be less intense as a result of climate change.
- None – climate change will have a negligible effect or no effect on the intensity of hazards.
- Do not know

[4] IPCC. (2015) *Fifth Assessment Report.* [Online] Available from: https://www.ipcc.ch/report/ar5/. [Accessed: 16th November 2015].

Timescale

Indicate the timescale over which your jurisdiction expects changes to the frequency and intensity of climate change hazards to occur based on the following list of values:

- Current – if your jurisdiction is already experiencing the identified impact from climate change.
- Short-term – if you anticipate your jurisdiction will experience the identified impact from climate change by 2025.
- Medium-term – if you anticipate your jurisdiction will experience the identified impact from climate change between 2026 and 2050.
- Long-term – if you anticipate your jurisdiction will experience the identified impact from climate change after 2051.

This question is asked because it provides a framework for identifying hazards that will be affected by climate change, and understanding how the identified hazards are expected to change and when these changes are anticipated to occur. Identifying future climate hazards can be useful in developing your jurisdiction's climate adaptation plan, and in prioritizing the implementation of specific adaptation actions. Understanding how climate change may influence local climate hazards can also provide useful guidance for the scope and focus of future risk and vulnerability assessments.

BOX 3: EXAMPLE OF FUTURE CLIMATE HAZARDS

Example: Imagined future climate hazards in a tropical coastal city

The theoretical city used for this example currently experiences frequent flooding during heavy rainstorms. City climate change projections show that while total annual precipitation is likely to increase over time, the annual number of storm events is likely to decline. However, the intensity and frequency of extreme rain events has is projected to rise.

Sea level rise is expected to increase the both the frequency and intensity of coastal flood events over the next 15 to 30 years, particularly during high tides. Higher sea levels will result in flooding father inland, and increase the duration and impact of coastal flood events. A higher frequency of extreme storms will also contribute to the intensity of coastal flooding and may increase the likelihood of coastal flood events.

Periods of drought experienced by the city are expected to occur with similar regularity during the dry summer months. However, global projections for increased temperatures indicate that the intensity of droughts will likely escalate in the short-term. It is unknown if rising temperatures will result in changes to the frequency of drought events.

While the city does not currently experience forest fires, the city's climate risk and vulnerability assessment show that this could become a concern in the future due to rising temperatures and dry conditions caused by more intense periods drought. More frequent and intense rainstorms will increase the probability of lightning strikes, which when combined with drought conditions can increase the frequency and intensity of forest fires.

The city's climate risk and vulnerability assessment also shows that warmer winter conditions are expected to reduce the risk of extreme cold days.

The table below provides an example of how this theoretical city would report its future climate change conditions.

Future hazards	Change in frequency	Change in intensity	Timescale
Rain storm	Increasing	Increasing	Current
Coastal flood	Increasing	Increasing	Medium-term
Drought	Do not know	Increasing	Short-term
Forest fire	Increasing	Increasing	Medium-term
Extreme cold days	Decreasing	Decreasing	Medium-term

Climate change impacts

This section asks respondents to describe how future climate hazards are likely to impact city assets and services across their jurisdiction, and to consider how serious those impacts are likely to be if no additional actions are taken to adapt to those risks.

Climate change impacts refer to the expected effect on natural and human systems that result from a change in the frequency or severity of extreme weather and climate events (i.e. climate hazards).

2.5 Please describe the overall impact of future hazards on your jurisdiction, and list the three critical assets or services that will be MOST affected by these impacts.

This table question is to understand the overall anticipated impact of future climate hazards on your jurisdiction (e.g. a citywide summary of impacts). Please identify the critical assets and services in your jurisdiction that will be most affected by climate change if adaptation actions are NOT taken. Describe the overall impact from each of the climate hazards faced your jurisdiction. Responses should be reported in the table provided using the drop-down menus where appropriate. Please refer to the example in Box 4 for more detail.

Climate hazards
Indicate the climate hazards relevant to your jurisdiction (i.e. the current and future climate hazards listed in Question 2.3 and Question 2.4). It is only necessary to select the most significant hazards that your jurisdiction experiences. Please add or delete table rows as needed for your entries.

[NB: Please select the most significant hazards in accordance with your jurisdiction's understanding of significance.]

Magnitude of impact
For each climate hazard identified in the first column, indicate the excepted magnitude or seriousness of its effects on your jurisdiction overall by selecting one of the following values:

- Extremely serious – you expect that the hazard may significantly affect the operation of a majority of critical assets and services across the jurisdiction, and may result in the death or injury of a significant number of people and/or extreme economic disruption.
- Serious – you expect that the hazard may significantly affect the operation of some critical assets and services, or moderately affect a majority of critical assets and services, and may result in the death or injury of a number of people and/or major economic disruption.

- Less serious – you expect that the hazard may moderately affect the operation of some critical assets and services, is unlikely to result in injury or death, but may cause moderate to negligible economic disruption.

Description of impact
Provide a general description (in 250 words or less) of how each of the future climate hazards identified in the first column is expected to affect your jurisdiction overall, including any interdependencies between various assets and services and any vulnerable populations that may be particularly affected.

Asset or service
In the three columns provided, indicate the three critical assets or services in your jurisdiction that will be MOST AFFECTED by the corresponding climate hazard in the first column based on the following list of values:

- Energy
- Water Supply & Sanitation
- Transport
- Waste Management
- Information & Communications Technology
- Food & Agriculture
- Environment
- Industrial
- Commercial
- Residential
- Education
- Public Health
- Community & Culture
- Law & Order
- Emergency Management
- Other

[NB: Different stakeholders have varied needs and priorities in relation to the risks of climate impacts. This question aims to capture an overview of your jurisdiction's OVERALL ASSESSMENT of the most critical city assets or services impacted by each climate hazard.]

This question is useful to understand how the influence of climate change on local climate hazards will affect your jurisdiction in the future, and to identify the key city assets and services that will be most affected by these changes. This information can help your jurisdiction develop its climate adaptation plan and adaptation actions by providing a greater level of detail about the impacts of future climate hazards.

BOX 4: EXAMPLE OF CRITICAL ASSETS OR SERVICES AFFECTED BY CLIMATE HAZARDS

Example: Imagined impacts of climate hazards to critical assets in a tropical coastal city

The theoretical city used for this example anticipates an increase in the intensity and frequency of extreme rain events. Flooding caused by intense rainfall can result in damage to above ground and underground electrical infrastructure, leading to prolonged electrical power outages and economic loss. Heavy rainfall can also overwhelm local drainage and storm sewer infrastructure, triggering sewage overflows into local water bodies. Combined with the flooding of estuaries and connecting rivers, overflow events can increase the risk of exposure to water-borne pathogens through the contamination of drinking water or direct contact and significantly impact public health and ecosystems.

Both the frequency and intensity of coastal flood events are expected to increase significantly over the next 15 to 30 years. The city's waterfront is home to a major commercial port and hosts thousands of miles of transportation infrastructure, all of which is at risk to severe damage and disruption resulting from coastal flooding and sea level rise. These events could severely affect commercial transportation activity and cost billions of dollars annually in lost revenue and restoration costs. Businesses without sufficient resources or continuity planning will be forced to close, leading to further economic losses and increased unemployment.

Periods of drought are expected to increase in intensity, while future changes to duration are uncertain. Elevated sea levels and excessive groundwater pumping to meet water supply demands can lead to the intrusion of seawater into the local aquifer system, which can significantly affect the availability of drinking water resources and the health of ecosystems. Diminished rainfall already affects agricultural production and the livelihoods it supports, and further drought conditions may lead to a decrease in food security for city residents and an increase in migration to the city from surrounding rural areas.

Climate hazards	Magnitude of impact	Description of impact	Asset or service	Asset or service	Asset or service
Rain storm	Serious	The increased intensity and frequency of rainfall events poses a major threat to our energy and water infrastructure. Disruptions to the electricity grid would result in major economic losses. Increased sewer overflow events have already contaminated local waterways during the wet season, and with an increasing population, we anticipate greater public health issues, particularly in our most vulnerable communities.	Energy	Water Supply & Sanitation	Public health
Coastal flood	Extremely Serious	Coastal flooding will severely disrupt our economy and result in cascading challenges that include a shrinking commercial sector and rising unemployment. Major damage to commercial transportation infrastructure will take significant time to repair and may lead to economic stagnation.	Transport	Commercial	Community & Culture

Drought	Serious	Increased instances of drought will strain our city's water resources, and the effect of drought on nearby agricultural producers will endanger our food supply. The potential increase in food prices will affect our vulnerable communities, and combined with an anticipated increase in rural-to-urban migration, the ability of our city to care for its residents will be compromised.	Water Supply & Sanitation	Food & Agriculture	Public Health

Adaptive capacity

This section asks respondents to describe how economic, social, environmental, and governance factors may influence their ability to adapt to climate change. It explores the broader context within which a jurisdiction is undertaking climate adaptation planning and implementation.

Adaptive capacity refers to the degree to which people, places, institutions and sectors are able to adapt to climate change impacts. It includes factors such as socio-economic and environment conditions, and local realities that enable a city or community to adjust its system in view of current and future risks. It may also include factors and conditions that leverage new climate conditions to become new opportunities.[5]

2.6 Please identify the factors that most greatly affect your jurisdiction's adaptive capacity, and describe how each factor either enhances or challenges this ability. [CDP Download – 2.2]

This table question is to identify factors in your jurisdiction that either enhance or challenge its capacity to adapt to the impacts of future climate hazards. Responses should be reported in the table provided using the drop down menus where appropriate. Please refer to the example in Box 5 for more detail.

Factors that affect adaptive capacity
Indicate the major factors that either enhance or challenge your jurisdiction's adaptive capacity. Please provide one response per table row, or select the 'other' value to add a new factor not listed.

Note that you can select the same factor more than once if that factor both enhances and challenges your jurisdiction's adaptive capacity. For example, a jurisdiction experiencing rapid urbanization may benefit from increased economic growth and human capital; however, this trend may also experience significant pressure on infrastructure services that may increase the risk of day-to-day service interruptions, thus weakening the city's resilience to shock events.

Factors can be selected from the following list of values:

- Access to basic services
- Access to healthcare
- Access to education
- Cost of living
- Housing
- Poverty
- Inequality
- Unemployment
- Public health
- Political stability
- Political engagement / transparency

[5] UN HABITAT. (2014) *Planning for Climate Change: A Strategic, Values-Based Approach for Urban Planners.* Nairobi, Kenya: United Nations Human Settlements Programme (UN-Habitat). Available from: http://unhabitat.org/books/planning-for-climate-change-a-strategic-values-based-approach-for-urban-planners-cities-and-climate-change-initiative/. [Accessed: 19 July 2015].

- Government capacity
- Budgetary capacity
- Migration
- Safety and security
- Economic health
- Economic diversity
- Rapid urbanization
- Resource availability
- Environmental conditions
- Infrastructure conditions / maintenance
- Infrastructure capacity
- Land use planning
- Community engagement
- Access to quality / relevant data
- Other

Enhance / challenge

Indicate whether each of the factors identified in the first column enhances or challenges your jurisdiction's adaptive capacity. Factors that enhance your adaptive capacity will be those that make adaptation easier, those that challenge will make it more difficult to adapt effectively. For an example response, please refer to Box 5 below.

Description

Provide a brief description (in 250 words or less) of how each factor identified in the first column is enhancing or challenging your jurisdiction's adaptive capacity.

This question is useful for understanding how current conditions experienced by your jurisdiction can influence its climate adaptation efforts. This provides important information for developing a climate adaptation plan and climate adaptation actions that address underlying factors and anticipate the potential difficulties that these factors can pose. By identifying the factors that enhance adaptive capacity, your jurisdiction can develop adaptation plans and actions to maximize their benefits.

BOX 5: EXAMPLE OF CITY REPORTING OF FACTORS THAT ENHANCE / CHALLENGE ADAPTIVE CAPACITY

Example: Imagined factors enhancing or challenging the adaptive capacity of a tropical coastal city

The theoretical city used for this example has spent the past decade investing in infrastructure upgrades and introducing policy measures to increase access to basic city services. While these actions were introduced primarily as an economic development effort, they have also enhanced the city's ability to adapt to climate hazards by improving infrastructure resilience and reliability and increasing the availability of social safety nets.

Conversely, government actions specifically for climate change are hindered by a lack of concern regarding the seriousness of the threat of climate change at a local and national level. Although the city has outlined a plan for climate adaptation and has begun to assess risks and vulnerabilities, local leadership has struggled to build the consensus needed to commit additional funds for dedicated staff and resources. National government funding is limited to post-disaster recovery and provides no resources for adaptation planning and action.

Rapid urbanization due to rural-to-urban migration has created additional challenges for adaptation efforts. An unanticipated rate of recent population growth has led to a shortage in affordable housing, and has reduced the city's capacity to provide social services. Public transit systems have become more congested, resulting in longer commute times, increased travel disruptions, and increased strain on infrastructure. Additional growth will require significant capital investment in energy and water infrastructure to expand service and capacity to meet new demand.

Underlying factors	Enhance / challenge	Description
Access to basic services	Enhance	Infrastructure improvements have increased the availability of reliable energy and water sources to the businesses and residents of our city. Modern technology allows us to identify and isolate leaks and outages, which improves our ability to cope with hazard events. Greater access to social services has increased the quality of life for many citizens, and this additional support has helped reduce the vulnerability of those most at risk to climate change impacts and hazards.
Government capacity	Challenge	In response to limited resources to fund and undertake climate risk and vulnerability assessments, we have made targeted decisions to prioritize efforts in developing a climate adaptation plan and implement climate adaptation actions. The national government only provides resources for disaster recovery, which makes it difficult for our city to pursue adaptation efforts. We do not have adequate staff to develop an adaptation plan, and do not have the political support to implement policy measures that result in projects and programs.
Rapid urbanization	Challenge	Rapid population growth has increased the number of disruptions to our city's public transportation system and has threatened our ability to provide housing and social support to our residents. If growth continues at this rate, our energy and water infrastructure will lack the capacity to meet additional demand.

Module 3: Plan, Respond and Monitor

This module is focused on the climate adaptation planning process undertaken by cities, and the ways in which cities evaluate the outcomes of their adaptation efforts. Reporting fields relate to adaptation planning, adaptation goals and actions, and adaptation barriers and opportunities.

Adaptation planning

This section asks respondents to describe the efforts to undertake climate adaptation planning and action. This section seeks to understand the progress a jurisdiction has taken to develop a climate adaptation plan, including the plan boundary, level of support by the local leadership for the planning process, process to review and update the plan, and stakeholder engagement efforts undertaken during the plan development and implementation.

3.0 Please describe your progress in the adaptation process. [CDP Download – 3.0]

Indicate the status of your jurisdiction's adaptation planning efforts for each phase of the adaptation process by selecting the most appropriate level of progress achieved from the following list of values:

- Completed – the particular phase of the climate adaptation planning process has been signed off and endorsed by leadership.
- In progress – the particular phase of the climate adaptation planning process is currently in progress or is waiting on endorsement by leadership.
- No – your jurisdiction has not yet begun to undertake the particular phase of the climate adaptation planning process.
- Not intending to undertake – your jurisdiction does not intend to undertake the particular phase of the climate adaptation planning process.
- Do not know

Phases in the adaptation process:

- Initiate climate adaptation effort – your jurisdiction has identified a vision and major goals, and begun to organize resources for adaptation planning.
- Identify / organize stakeholders – relevant stakeholder groups, roles and responsibilities have been defined, and an engagement plan has been created.
- Conduct climate vulnerability study – a hazard and vulnerability assessment has been conducted, and risks have been identified and prioritized.
- Set goals – specific goals for adaptation action have been developed and prioritized.
- Develop adaptation options – options for adaptation action have been identified and assessed.
- Develop adaptation plan – plan to implement adaptation actions has been developed and implementation tools have been identified.

- Implement adaptation plan – your jurisdiction has begun to implement actions from climate adaptation plan.
- Measure progress – your jurisdiction has begun to track and monitor the progress of adaptation actions.
- Update plan – your jurisdiction has begun to update the adaptation plan based on the progress and success of adaptation actions.

This question is useful for understanding the current progress of your jurisdiction in the climate adaptation planning process and for identifying next steps for adaptation efforts. While all jurisdictions face unique challenges, a shared roadmap for climate adaptation planning provides support for undertaking and reviewing the progress of adaptation activities. The planning process phases identified in CRAFT represent best practice principles that are based on existing city climate adaptation planning guidance and city adaptation plans, and have been verified by technical advisors and city government practitioners.

3.1 Does your local government have a plan that addresses climate adaptation?

Climate adaptation plan

Indicate whether your jurisdiction has produced a climate adaptation plan, or has addressed adaptation within the context of another long-term plan or strategy by selecting 'Yes', 'No' or 'Do not know' from the drop down menu for each of the reporting fields provided.

[NB: Please consider any plan produced for your jurisdiction that addresses adaptation to climate risks and vulnerabilities as a 'climate adaptation plan' (e.g. a 'Yes' response), even if the title does not specifically reference climate adaptation. The following reporting fields enable further description of the characteristics of the plan.]

Nature of climate adaptation plan

Please respond only if you have selected 'Yes' for the previous question. Indicate the general nature of how climate adaptation is addressed in the plan(s). Select the most appropriate response from the following list of values, or select 'Other' to provide a description of how climate adaptation is addressed in your jurisdiction's plans:

- Standalone climate adaptation plan – your jurisdiction has produced a standalone plan for climate adaptation in which adaptation is the primary or sole focus.
- Addressed in combined adaptation and mitigation climate action plan – climate adaptation is addressed within a plan that covers both climate mitigation and adaptation for your jurisdiction.
- Addressed in general city plan – climate adaptation is addressed within the context of a long-term plan or strategy for your jurisdiction. For example, adaptation is addressed within your jurisdiction's sustainability plan, or is addressed within a plan for long-term growth.

- Addressed in city sector plan(s) – climate adaptation is addressed within plans produced by one or more of the services or departments managed by your local government. For example, adaptation is addressed within a water management plan for your jurisdiction, or by a capital plan for your jurisdiction's transportation department.
- Other

If 'Yes' or 'Do not know' is selected for the 'Standalone climate adaptation plan' or 'Addressed in general city plan' reporting fields you will be directed to question 3.1a. If you select 'No' you will be directed to question 3.2.

This question is asked to understand your jurisdiction's plan for addressing climate adaptation. A climate adaptation plan is critical for establishing adaptation goals, and identifying adaptation actions and strategies for implementation. It can also specify the manner in which the outcomes of adaptation actions are monitored and reported. It is therefore important to report whether this information exists as part of the disclosure of your jurisdiction's adaptation planning process.

3.1a *If yes to 3.1:* Please provide more information about your plan that addresses climate adaptation.

This question is applicable if you have selected 'Yes' in question 3.1 to indicate that your jurisdiction has a standalone climate adaptation plan, or that climate adaptation is address within the context of a long term plan or strategy for your jurisdiction. If you have selected 'Do not know' to indicate that you are uncertain if the plan qualifies as one that addresses climate adaptation, please provide additional details about it in this question.

Scope of the plan or plans
Indicate the administrative boundary of the relevant plan or plans by selecting the most applicable response from the following list of values:

- City / Municipality
- Local government area within a city / metropolitan area
- Independent city
- Special city
- Federal district
- Sovereign city-state
- Metropolitan area
- County
- Other area

[NB: Please refer to Question 1.0 guidance for a full explanation of these terms.]

Area under your jurisdiction's control
Indicate the boundary of jurisdictional control in respect to adaptation planning by selecting the most applicable response from the following list of values:

- Financial boundary of city governance

- Operational boundary of city governance
- Administrative boundary of city governance

Primary author of plan
Indicate the primary author responsible for the primary planning document to address climate adaptation in your jurisdiction by selecting the most applicable response from the following list of values:

- Dedicated city team
- Relevant city department
- Consultant
- International organization
- Community group
- Regional / state / provincial government
- National / central government
- Other

[NB: A 'Dedicated city team' may be comprised of a team of people or a single person designated with authority by the local government to undertake climate adaptation planning. This reporting option is distinct from a city staff person or team within a city department that may undertake adaptation planning from the perspective of their city department, rather than a citywide assessment.]

Publication title
Indicate the official title of the primary planning document to address climate adaptation in your city.

Year of publication
Indicate the year that the primary planning document to address climate adaptation in your city was completed, or is expected to be complete.

Attach the document
Click on 'Choose file', navigate to the file you want to upload and click 'Open'. Once you can see the file name in the text field click 'Attach & Save' to attach the document.

This question is asked in order to understand the scope your jurisdiction's plan to address climate change and the area that it covers. This information, when combined with previous questions that address the scope of your jurisdiction's administrative responsibility and the area covered by your vulnerability assessment, can be used to assess the alignment of climate adaptation efforts with administrative boundaries and can help to identify gaps in coverage or jurisdictional control.

3.2 Please describe the level of support for adaptation planning. [CDP Download – 3.1]

Indicate the level of support from local leadership in your jurisdiction for adaptation planning and adaptation actions.

Dedicated staff and resources
Indicate if your jurisdiction has dedicated staff and provides resources specifically for adaptation planning and adaptation actions by selecting 'Yes', 'No' or 'Do not know' from the drop down menu.

[NB: The 'dedicated staff' may be one person or a team of people with authority from the local government to work full-time or part-time on adaptation planning efforts.]

If yes, what is the relationship between dedicated staff and local leadership?
This question only applies if you have selected 'Yes' to report that your jurisdiction has dedicated staff and resources to address climate adaptation planning and action. Please select the most appropriate description of the relationship between dedicated staff and local leadership in your jurisdiction from the following list of values:

- Directly report
- Report one level removed
- Report two levels removed
- Report three or more levels removed

If yes, please indicate the accessibility of the local leadership by the dedicated staff
This question only applies if you have selected 'Yes' to report that your jurisdiction has dedicated staff and resources to address climate adaptation planning and action. Please, select the most appropriate description of the accessibility of the local leadership by the dedicated staff from the following list of values:

- Regular, official contact
- Regular, unofficial contact
- Irregular, official contact
- Irregular, unofficial contact

This question is asked in order to understand the level of support provided by your jurisdiction's leadership for adaptation planning efforts. Dedicated staff and resources for adaptation planning is one indicator of government support, but may not apply to certain jurisdictions. The relationship between adaptation staff and local leadership, both formal and informal, can also indicate the degree to which adaptation efforts are supported.

3.3 Please describe the update / revision process for your adaptation plan. [CDP Download – 3.2]

Indicate whether your jurisdiction has established an approach for updating / reviewing its climate adaptation plan and describe the update / revision process, including the number of years between formal updates if applicable and the status of current updates / revisions.

Formal schedule for update

Indicate if your jurisdiction has established a schedule for updates or revisions to its adaptation plan by selecting 'Yes', 'No' or 'Do not know' from the drop down menu. A formal schedule implies that updates or revisions to the adaptation plan are completed at regular, predefined intervals of time.

If yes, what is the time period for update (years)
This question only applies if you have selected 'Yes' to report that your jurisdiction has a formal schedule for updates or revisions to its adaptation plan. If you responded 'Yes' in the previous field, indicate the number of years between updates or revisions to your jurisdiction's climate adaptation plan.

If no, or do not know, do you have an alternative update schedule or trigger?
This question only applies if you have selected 'No' or 'Do not know' to report that your jurisdiction does not have, or that you are not aware of, a formal schedule for updates or revisions to its adaptation plan. If your jurisdiction has not established a formal schedule, but follows some other approach for updates or revisions to its adaptation plan, please provide a brief description (250 words or less) of this approach. Other approaches may include *ad hoc* updates based on the availability of new information, updates due to a major disaster event, or updates driven by political terms.

Status of current update
If applicable, indicate the status of updates or revisions to your jurisdiction's climate adaptation plan by selecting one of the following values:

- Completed
- In progress
- No
- Not intending to undertake
- Do not know

Number of times previously updated
If applicable, indicate the number of times your jurisdiction's climate adaptation plan has been previously updated or revised.

[NB: This question seeks to identify the number of times your jurisdiction has undertaken an update to its climate adaptation plan, separate from an initial plan. This may include partial updates to address individual planning areas, or a full, comprehensive update.

For example, you may have selected 'In progress / incomplete' above to report that your jurisdiction has begun to revise its climate adaptation plan, and this current work represents an update to a previous, initial assessment. Please report '0' for number of previous updates, excluding the initial assessment.

Alternatively, for example, you may have selected 'In progress / incomplete' above to report that your jurisdiction has begun its fourth annual revision to its climate adaptation plan. Please report '3' for number of previous updates, excluding the initial planning work.]

The purpose of this question is to understand the process used by your jurisdiction to update its climate adaptation plan, and the number of updates or revisions that have previously been undertaken. Because the risks faced by your jurisdiction will constantly change and evolve, it is useful to have an established process for regularly reviewing and revising your climate adaptation plan.

3.4 Please describe your progress in engaging stakeholders for adaptation planning. [CDP Download – 3.3]

Indicate the status of stakeholder identification and engagement that your jurisdiction has undertaken as part of its climate adaptation planning efforts. Please select the most appropriate level of progress for each stage from the following list of values:

- Completed – stakeholder engagement activities for adaptation planning have been signed off and endorsed by leadership.
- In progress – stakeholder engagement activities for adaptation planning are currently in progress or are waiting on endorsement by leadership.
- No – your jurisdiction has not embarked on effort to undertake stakeholder engagement for adaptation planning, or develop a stakeholder engagement plan.
- Not intending to undertake – your jurisdiction does not intend to undertake stakeholder engagement for adaptation planning, or develop a stakeholder engagement plan, now or in the future.
- Do not know

Identification of stakeholders
Identify the extent to which your jurisdiction has identified relevant stakeholder groups, and determined their roles and responsibilities in the climate adaptation planning process.

Plan for stakeholder engagement
Identify the extent to which your jurisdiction has prepared a stakeholder engagement plan to build and maintain support for climate adaptation planning.

Implementation of stakeholder engagement plan
Identify the extent to which your jurisdiction has implemented its stakeholder engagement plan and is using stakeholder feedback to help guide adaptation planning efforts.

Stakeholder engagement is an important element in the climate adaptation planning process. Stakeholder engagement enables communication and the exchange of information to develop a better understanding of issues related to climate hazards, vulnerability and risk, and potential adaptation solutions. It is necessary to build support for adaptation activities and can help to guide and inform adaptation goals and actions. This question can be used to help

evaluate the extent to which your jurisdiction has identified and engaged stakeholder groups for adaptation planning.

3.5 If you wish, please provide further details about your stakeholder engagement process, including any successes or outcomes. [CDP Download – 3.4]

Provide a description (500 words or less) of your jurisdiction's progress in undertaking stakeholder engagement activities. Indicate the primary method the jurisdiction has used to identify and engage stakeholders, as well as any key stages in which specific groups have been involved. Please describe any successes or outcomes from your engagement process, and note any remaining actions that have not yet been implemented. If your jurisdiction is taking initial steps in stakeholder engagement, please indicate any formal next steps or actions, and provide a description of the engagement process.

This question can be used to help evaluate the progress of your jurisdiction's stakeholder engagement activities. Because of the range of interests and contextual factors involved, the outcomes of specific engagement processes may vary considerably. The development of a plan for stakeholder identification and engagement enables jurisdictions to track the progress and outcomes of engagement actions based on their individual goals.

Adaptation goals

This section asks respondents to describe the main goals for their adaptation plan, as well as to describe what method, if any, the jurisdiction has in place to measure progress towards achieving these goals. This section also seeks to understand how a jurisdiction's climate adaptation plan supports broader themes of city resilience by identifying the extent to which the adaptation plan also addresses underlying factors that may challenge the jurisdiction's ability to adapt.

3.6 Please describe the main goals of your jurisdiction's adaptation efforts and the metrics / KPIs (if applicable) for each goal. [CDP Download – 3.5]

This table question is to identify the overarching goals for your jurisdiction's adaptation efforts, and to understand if and how your jurisdiction plans to monitor and evaluate progress towards these goals. An example response has been provided in Box 6 below.

[NB: This reporting section aims to identify your jurisdiction's high-level goals for your adaptation efforts, overall. Some jurisdictions may refer to this high-level focus as 'visions', 'priorities', 'strategies', 'outcomes', etc. These goals are typically broader in scope than adaptation actions, which are understood as discrete activities taken to achieve the goals.]

Adaptation goals

Briefly state (10 to 20 words) your jurisdiction's main goals for climate adaptation. If possible, these goals should be time bounded, and able to be monitored and evaluated based on specific metrics or key performance indicators (KPIs). Please add or delete table rows as needed for your entries.

Goal timescale
Indicate the intended timescale for initiating actions to achieve each of the adaptation goals listed by selecting one of the following values:

- Current – goal is currently being pursued.
- Short-term – goal expected to be achieved in the next 10 years.
- Medium-term – goal expected to be achieved in the next 10-25 years.
- Long-term – goal expected to be achieved in more than 25 years.

Metrics / KPIs
If applicable, briefly state (5 to 10 words) the metrics or KPIs that are being used to monitor and evaluate progress towards the goals identified in the first column.

Reporting frequency
If applicable, indicate the frequency that performance towards individual metrics or KPIs are being reported by selecting one of the following values:

- Annual performance
- Short-term (1-2 years)
- Medium-term (3-5 years)
- Long-term (6-10 years)
- Horizon planning (10+ years)

Source of goal
If applicable, indicate if the adaptation goal set by your jurisdiction relates to an external source. Select the most appropriate description from the list, or select the 'other' value to provide further description of the source of the adaptation goal.

- Local jurisdiction – the goal was developed solely by your local jurisdiction.
- Higher level of government – the development of the goal was influenced by a higher level of government, such as county, state, regional, or national government.
- International agreement – the development of the goal was influenced by a politically binding international agreement, such as a convention or charter.
- Stakeholder partnership – the development of the goal was influenced by a stakeholder partnership, such as a collaborative network.
- Other

The purpose of this question is to identify your jurisdiction's main adaptation goals and the processes used to evaluate their progress. Climate adaptation plans should include measurable goals and performance metrics to ensure that adaptation actions are achieving their desired outcomes. Regular assessment can help guide future updates or revisions to your jurisdiction's climate

adaptation plan by identifying which strategies have been the least or most effective in meeting adaptation goals.

BOX 6: EXAMPLE OF CITY REPORTING OF ADAPTATION GOALS AND THE METRICS / KPIS FOR EACH

Example: Imagined overall goals for set for a tropical coastal city for its climate adaptation planning efforts

The theoretical city used for this example faces climate hazards and climate change impacts that can potentially disrupt water and wastewater services. To adapt, the city has set a goal to improving the resilience of sewer and stormwater systems through infrastructure upgrades and improvements over the next five years. The city has also engaged in a partnership with other jurisdictions in the region to set a 15-year goal for reducing the depletion of groundwater in shared aquifers.

Adaptation goals	Goal timescale	Metrics / KPIs	Reporting frequency	Source of goal
Increase resilience of sewer and stormwater systems	Current	% of assets impacted by 1 in 100 year rain event	Annual	Local jurisdiction
Limit depletion of water resources	Long-term	% change in groundwater storage levels	Horizon planning	Higher level of government

Adaptation actions

This section asks respondents to describe the actions their jurisdiction is taking to adapt to climate hazards and impacts, as well as to describe what method, if any, the jurisdiction has in place to measure progress towards achieving these actions. This section also seeks to identify which actions, if any, that a jurisdiction has modified or allowed to lapse to support shared learning.

3.7 Has your jurisdiction identified and selecting specific adaptation actions? [CDP Download – 3.6]

Provide information on your jurisdiction's progress in identifying and selecting specific actions for climate adaptation, and provide a description of the processes used for identification and selection.

Adaptation actions identified
Indicate your jurisdiction's progress in identifying specific adaptation actions by selecting one of the following values:

- First assessment - Completed
- Reassessment - Completed
- First assessment - In progress / incomplete
- Reassessment - In progress / incomplete
- Not started
- Not intending to undertake
- Do not know

Description of identification process
Provide a brief description (250 words or less) of the process that your jurisdiction used to identify adaptation actions (including a summary of historic and current efforts, if applicable).

Method of action selection / prioritization
Indicate the primary method used to select or prioritize adaptation actions by selecting one of the following values:

- Benefit-cost analysis – a systematic quantitative approach to decision-making based on estimating the net monetary value associated with an action (e.g. comparing benefits (strengths) with costs (weaknesses)).
- Cost-effectiveness – an economic analysis that compares the relative costs and outcomes (effects) of two or more courses of action
- Multiple-criteria decision analysis – approach that supports decision-making by structuring and solving decision and planning problems involving multiple criteria.
- Stakeholder consensus decision-making – a group decision-making process in which affected parties (stakeholders) seek to reach agreement on a course of action to address an issue, or set of issues, in a mutually acceptable solution.

- Experiment and observe – predictive assessment method in which the actor predicts the outcomes of actions, undertakes the action, and evaluates the outcomes for alignment to predictions.

Description of action assessment
Provide a brief description (250 words or less) of the methods used to assess adaptation actions. Include the primary method (such as the assessment methods listed above) and any other methods of assessment that were used.

The purpose of this question is to understand the methods used by your jurisdiction to identify, select, and prioritize climate adaptation actions. The processes used for this can vary in complexity and approach. Selection and prioritization methods should reflect the specific needs and capacity of your jurisdiction, and should ensure that actions are contextually appropriate.

3.8 How would you describe your progress in implementing your plan (for example, the extent to which your city has undertaken the actions set out in your plan)? [CDP Download – 3.7]

Provide a description (500 words or less) of your jurisdiction's progress in implementing its adaptation plan(s). Indicate the extent to which your jurisdiction has undertaken the adaptation actions identified, and the remaining actions that have not yet been implemented. If your jurisdiction is currently tracking the progress of adaptation actions, indicate the metrics or key performance indicators (KPIs) being evaluated and provide a description of the reporting process.

The purpose of this question is to understand your jurisdiction's progress in the implementation of a climate adaptation plan and adaptation actions. As previously mentioned, climate adaptation plans should include measurable goals and performance metrics to ensure that adaptation actions are achieving their desired outcomes.

3.9 If applicable, please describe any changes made to the adaptation actions identified in your plan. [CDP Download – 3.8]

This table question is to identify if any adaptation actions previously established by your jurisdiction have been changed, updated, or abandoned, and to understand the factors that contributed to this decision. Please add or delete table rows as needed for your entries.

Adaptation actions changed
Briefly state (10 to 20 words) the adaptation actions established by your jurisdiction that have been changed (e.g. updated, re-targeted or re-positioned) or allowed to lapse.

Description of changes or lessons learned
Provide a brief description (250 words or less) of the changes made to the adaptation actions listed in the first column or lessons learned during

development or implementation. Please include the factors that contributed to this decision, such as poor performance of difficulties with implementation.

The purpose of this question is to understand, if applicable, why certain adaptation actions undertaken by your jurisdiction were not effective. This information can be used to improve the success of adaptation planning by providing greater insights into the factors that have limited the success of certain adaptation actions.

3.10 Please describe how much your adaptation actions will address the underlying factors that challenge your jurisdiction's ability to adapt. [CDP Download – 3.9]

This table question is to understand how much / to what extent your adaptation planning efforts aim to address the underlying factors that challenge your capacity to adapt. This question aims to take a broader view of how adaptation efforts also support broader city issues (e.g. city resilience).

These factors and their effects may have been identified through formal assessment, or informal methods. Please apply your best estimate to the following questions. An example response has been provided in Box 7 below.

Underlying factors
Indicate the underlying factors that CHALLENGE your jurisdiction's adaptive capacity (i.e. the factors identified as a 'challenge' in Question 2.2). You are not required to provide a response for each of the factors identified in Question 2.2. However, if possible please describe why certain factors were not addressed. You can also identify additional factors that challenge your city by adding table rows as needed.

Extent addressed
Indicate the extent to which your jurisdiction's adaptation planning addresses each of the factors identified by selecting one of the following values:

- Fully – factor should not pose a challenge to the adaptive capacity of your jurisdiction through implementation of the adaptation actions.
- Somewhat – factor should pose less of a challenge to your jurisdiction's adaptive capacity.
- Not at all – factor will still pose a challenge to your jurisdiction's adaptive capacity.
- Do not know

Description of approach
Briefly describe (100 words or less) the approach used to address the factors identified in the first column that challenge your jurisdiction's ability to adapt. It is not necessary to list specific goals or actions, but do indicate if specific goals or actions that address the factor identified have been established.

This question is useful for understanding how your jurisdiction's adaptation goals address the underlying factors reported in Module 2 that challenge

adaptive capacity. This information can be help guide future revisions or updates to your jurisdiction's climate adaptation plan by identifying factors that have not yet been addressed or still pose a challenge.

BOX 7: EXAMPLE OF CITY REPORTING OF UNDERLYING FACTORS ADDRESSED BY ADAPTION PLANNING

Example: Imagined underlying factors addressed by adaptation planning in a tropical coastal city

The theoretical city used for this example experiences frequent surface and river flooding during heavy rain storms due to a large area of impervious surface cover and an outdated storm sewer system. In addition, while infrequent, coastal flooding can also occur when heavy rain combines with high tides.

As part of their climate adaptation planning efforts, the city has established a set of goals including to increase the resilience of sewer and stormwater systems and to limit depletion of water resources.

To achieve these goals, the city is currently implementing actions to engage local universities to enhance the robustness of climate risk models to identify future impacts of climate change on storms and rainfall events, combined with future development plans and population growth. The city is also working across government departments to the city install green infrastructure throughout the city, capturing a range of economic, social and environmental co-benefits.

As described previously, the imagined city used in this example experiences challenges of urban stresses in day-to-day city life. The local government has limited available resources to undertake climate risk and vulnerability assessments and implementation efforts. In addition, recent rapid urbanization has created overall capacity pressures on city infrastructure and services, especially on drainage and storm and sanitary sewer systems resulting from increased users, development and loss of natural hydrological systems.

The actions, while taken as part of the city's climate adaptation planning efforts, also help to directly address these challenges and enhance the city's overall resilience to shocks and stresses.

Underlying factors	Extent addressed	Description of approach
Government capacity	Fully	The city is working with local universities to undertake and expand its climate risk and vulnerability assessments. This initiative generates detailed data that the city can use to inform planning efforts while leveraging the expertise and research facilities of the local universities and enhancing stakeholder engagement efforts to increase expert input to climate adaptation efforts.
Rapid urbanization	Somewhat	By expanding the city's green infrastructure systems in coordination with upgrading the city's storm and sanitary sewers and wastewater treatment facilities, the city is putting in place infrastructure that will be able to effectively and safely meet the city's current needs as well as accommodate growth population projected over the next 50 years.

Barriers and opportunities

This section asks respondents to identify additional benefits or improvements that have arisen from their adaptation planning efforts, as well as any barriers the jurisdiction may have experienced and solutions taken to overcome these challenges. This section also aims to identify any additional support jurisdictions may seek to support their climate adaption efforts.

3.11 Please identify and describe any additional benefits or improvements resulting from adaptation planning and / or adaptation actions (in addition to the reduction of climate risks). [CDP Download – 3.10]

This table question is to identify any additional benefits or improvements that your jurisdiction has experienced that have resulted from adaptation planning and / or the implementation of adaptation actions. This does not include benefits directly associated to the reduction of climate risks. Please add or delete table rows as needed for your entries.

Additional benefits or improvements

Adaptation to climate risks or vulnerabilities may present opportunities for your local jurisdiction. Describe any benefits or improvements your jurisdiction has encountered in implementing your adaptation planning and / or adaptation actions. Benefits or improvements may be direct or indirect outcomes or co-benefits that originate within or outside your local jurisdiction, may be permanent or temporary, and may encourage, accelerate, enhance or focus implementation of climate adaptation action. Use the drop down list to select as many types of benefits or improvements that may apply to describe the day-to-day experience of your jurisdiction; you will have opportunity to describe specific examples in the next data field.

- Political and Leadership – benefits or improvements that relate to effective leadership and management, and that promote inclusive and constructive governance between key leaders and the broader business and civil society.
- Institutional, Regulatory and Legislative – benefits or improvements that relate to the methods used to develop and enforce policies and laws, including enhanced coordination of climate action across government and other key stakeholders.
- Resources and Funding – benefits or improvements related to a jurisdiction's ability to secure funding for climate action, or to access appropriate staff and expertise to establish and implement climate action.
- Information and Knowledge – benefits or improvements that relate to a jurisdiction's ability to access the information and knowledge required to make effective decisions about climate action.
- Social and Cultural – benefits or improvements that relate to the accepted norms, practices and behaviors of a jurisdiction's institutions, businesses and citizens that may enhance the effectiveness of climate action.

- Technology and Infrastructure – benefits or improvements that relate to the availability and compatibility of appropriate functional or proven technologies or infrastructures required to deliver climate action.
- Physical Environment – benefits or improvements that relate to a jurisdiction's physical environment (natural and manmade) and that enhance the viability of climate actions, including land use planning.

Additional benefits or improvements
Briefly state (10 to 20 words) the major benefits or improvements that your jurisdiction has experienced because of adaptation planning and / or actions.

Description of benefits or improvements
Provide a brief description (250 words or less) of each of the benefits or improvements identified in the first column.

This question is meant to help articulate the co-benefits achieved through your jurisdiction's adaptation planning processes.

3.12 Please identify and describe any barriers your jurisdiction has encountered in implementing your adaptation planning and / or adaptation actions, and any solutions or interventions taken to overcome those barriers. [CDP Download – 3.11]

This table question is to identify any barriers that your jurisdiction has encountered in the adaptation planning process or in implementing adaptation actions, and any solutions your jurisdiction has identified or undertaken to overcome those barriers. Please add or delete table rows as needed for your entries.

Barriers to adaptation
Describe any barriers your jurisdiction has encountered in implementing your adaptation planning and / or adaptation actions. Barriers (also called obstacles or challenges) may be permanent or temporary, originate within or outside your local jurisdiction, and may prevent, delay, limit or divert implementation of climate adaptation actions. Use the drop down list to select as many types of barriers that may apply to describe the day-to-day experience of your jurisdiction; you will have opportunity to describe specific examples of barriers in the next data field.

- Political and Leadership – challenges that relate to prevailing political ideologies or priorities, forms of governance, or the strength of leadership provided by key actors.
- Institutional, Regulatory and Legislative – challenges that result from conflicting interests between government agencies, or policies and legislation, including difficulties coordinating climate action across government agencies and organizations.
- Resources and Funding – challenges that relate to a jurisdiction's ability to secure funding for climate action or to access appropriate staff and expertise to establish and implement climate actions.

- Information and Knowledge – challenges that relate to a jurisdiction's ability to access the information and knowledge required to make effective decisions about climate action.
- Social and Cultural – challenges that relate to the accepted norms, practices and behaviors of a jurisdiction's institutions, businesses and citizens that may detract from the effectiveness of climate action.
- Technology and Infrastructure – challenges that relate to the availability and compatibility of appropriate functional or proven technologies or infrastructures required to deliver climate action.
- Physical Environment – challenges that relate to a jurisdiction's physical environment (natural and manmade) and that enhance the viability of climate actions, including land use planning.

[NB: For further information on research relating to barriers or challenges to climate adaptation planning and implementation, please refer to the C40 and Arup report 'Potential for Climate Action', available online from www.c40.com and www.arup.com.]

Description of barriers to adaptation
Provide a brief description (250 words or less) of the barriers identified in the first column. Describe how these barriers have affected adaptation planning and implementation in your jurisdiction.

Description of how barrier was overcome
Provide a brief description (250 words or less) of how your jurisdiction was able to overcome the barriers identified in the first column. Describe how solutions were identified and undertaken, and how successful each solution was in overcoming the associated adaptation barrier.

This question is meant to help identify and assess the main barriers to climate adaptation faced by your jurisdiction, and the strategies used to overcome these barriers.

3.13 Please describe any additional resources that could help your jurisdiction's adaptation efforts. [CDP Download 3.12]

This question is to provide space for listing any additional needs or resources that could help your jurisdiction with adaptation planning and/or implementation efforts. Provide a brief description of one type or category of resource needs within per row: this could include additional resources of any type, greater public awareness, etc. Please add or delete table rows as needed for your entries.

This question is meant to help identify adaptation needs in your jurisdiction that are not currently being addressed, which can be used to support advocacy for additional adaptation planning resources.

Appendix A: Record of questions for potential future expansion

The questions in this section ARE NOT included in the current CRAFT recommendations to CDP and ICLEI.

This section provides a record of auxiliary questions that were created during the CRAFT development process but were not included within the current scope of the CRAFT questionnaire. They are provided here for reference only.

These questions may be incorporated into the CDP, ICLEI or other reporting platforms in the future, or completed through post-processing data analysis.

The questions are numbered to align with the main CRAFT reporting modules, and are identified as auxiliary questions with the prefix ‘A’.

A1: Profile the City

This section contains auxiliary questions for CRAFT Module 1: Profile the City. These questions represent information that could be collected through the further analysis of individual jurisdictions following the completion of Compact of Mayors required reporting.

A1.0 Please provide further details about the geography of your jurisdiction.

Further details about the geography and climate of the reporting jurisdiction will be derived from other data sources.

Average annual temperature (in Celsius)
Provide the most relevant average annual temperature for the reporting jurisdiction in degrees Celsius (°C) based on available data sources.

Land area (in square km)
Provide the total land area of the reporting jurisdiction in square kilometers (sq. km), defined to the extent possible by the administrative boundary indicated in question 1.0 and available data sources.

Average altitude (m)
Provide the average altitude for the reporting jurisdiction in meters (m) above sea level based on available data sources.

Longitude and Latitude
Provide coordinates for the reporting jurisdiction in decimal degrees based on the most relevant of: centroid of administrative area, centroid of central business district, point location of primary government facility.

Global region
Indicate most appropriate global region for the reporting jurisdiction from the following list of values:

- Africa
- Caribbean
- Europe
- Latin America
- Middle East
- North America
- South and West Africa
- Southeast Asia and Oceania

Climate type

Indicate the most appropriate climate type for the reporting jurisdiction based on the Köppen climate classification:

- A – Tropical moist climate
- B – Dry climate
- C – Moist mid-latitude climate with mild winters
- D – Moist mid-latitude climate with cold winters
- E – Polar climate
- H – Highland climate

A1.1 Please provide further details about your current and projected population density.

Population density (per square km)
Calculate the population density per square kilometer of the reporting jurisdiction by dividing the 'current population' value reported in question 1.2 for 'current population' by the value for 'land area (in square km)' reported in A1.0 (i.e. current population / land area).

Projected population density change (%)
Calculate the percent projected population density change of the reporting jurisdiction by using the values reported in question 1.2 to determine the change in population, dividing the change in population by the initial population value, and multiplying by a factor of 100 (e.g. ((projected population – base population) / base population) * 100).

A2: Understand the Problem

This section contains auxiliary questions for Module 2: Understand the Problem. These questions represent additional information and details about the reporting jurisdiction's climate risk and vulnerability assessment.

A2.0 Please identify the types of climate hazards addressed by the assessment and the method(s) by which they were assessed.

This table question is to identify the types of climate hazards that are addressed by your jurisdiction's climate risk or vulnerability assessment, and to describe the level of progress and assessment process used for each of the hazard types listed.

Hazard types
Indicate the types of climate hazards addressed by your jurisdiction's risk or vulnerability assessment from the following list of values:

- Storm
- Extreme temperature (cold)

- Extreme temperature (hot)
- Water scarcity
- Wild fire
- Flood
- Sea level rise
- Wave action
- Chemical change
- Mass movement
- Insects and microorganisms

More information about each climate hazard type can be found in the Glossary provided in Appendix B.

Status of assessment
Indicate the status of assessment for each of the hazard types identified in the first column by selecting one of the following values:

- First assessment - Completed
- First assessment - In progress / incomplete
- Reassessment - Complete
- Reassessment - In progress / incomplete
- Not started
- Not intending to undertake
- Do not know

Description of assessment
Briefly describe (250 words or less) the method(s) used to assess each of the climate hazard types you have identified in the first column.

A2.1 Please identify the critical assets addressed by the assessment and the method(s) by which they were assessed.

This table question is to identify the critical assets in your jurisdiction that are addressed by your climate risk or vulnerability assessment, and to describe the level of progress and assessment process used for each of the critical assets listed.

Critical assets
Indicate the critical assets addressed by your jurisdiction's risk or vulnerability assessment from the following list of values:

- Energy
- Water Supply & Sanitation
- Transport
- Waste Management
- Information & Communications Technology
- Food & Agriculture

- Environment
- Industrial
- Commercial
- Residential
- Education
- Public Health
- Community & Culture
- Law & Order
- Emergency Management
- Other

It is only necessary to select the critical assets directly addressed by your jurisdiction's climate risk or vulnerability assessment. Please add or delete table rows as needed for your entries.

Status of assessment
Indicate the status of assessment for each of the critical assets identified in the first column by selecting one of the following values:

- First assessment - Completed
- First assessment - In progress / incomplete
- Reassessment - Complete
- Reassessment - In progress / incomplete
- Not started
- Not intending to undertake
- Do not know

Description of assessment
Briefly describe (250 words or less) the method(s) used to assess each of the critical assets identified in the first column.

A2.2 Please describe the characteristics of vulnerability that you considered in the assessment and the method(s) by which they were assessed.

This table question is to identify the characteristics of vulnerability that were considered in conducting your jurisdiction's climate risk or vulnerability assessment, and describe the level of progress and methods used to assess the impact of climate hazards on populations with these characteristics.

Vulnerability characteristics
Indicate the vulnerability characteristics addressed by your jurisdiction's risk or vulnerability assessment from the following list of values:

- Age
- Gender
- Language

- Resident status
- Housing status
- Disability
- Income status
- Other

It is only necessary to select the vulnerability characteristics directly addressed by your jurisdiction's climate risk or vulnerability assessment. Please add or delete table rows as needed for your entries.

Status of assessment
Indicate the status of assessment for each of the vulnerability characteristics identified in the first column by selecting one of the following values:

- First assessment - Completed
- First assessment - In progress / incomplete
- Reassessment - Complete
- Reassessment - In progress / incomplete
- Not started
- Not intending to undertake
- Do not know

Description of assessment
Briefly describe (250 words or less) the method(s) used to assess the impacts of climate change on populations with the vulnerability characteristics identified in the first column.

A3: Plan, Respond and Monitor

This section contains auxiliary questions for Module 3: Plan, Respond and Monitor. These questions are meant to collect information about specific adaptation actions developed by the reporting jurisdiction, and the approaches used to track and monitor each action's performance.

A3.0 Please identify and describe your jurisdiction's adaptation actions, including primary responsibility, scale of action and level of risk mitigated.

This table question is to identify the adaptation actions established by your jurisdiction's plan(s) for climate adaptation, and to provide information about the party primarily responsible, the current level of implementation and the anticipated impact of each.

Adaptation actions

Briefly state (10 to 20 words) the adaptation actions established by your jurisdiction. Please add or delete table rows as needed for your entries.

Primary responsible party
Indicate the party primarily responsible for implementing each of the actions identified in the first column by selecting the most applicable response from the following list of values:

- Dedicated city team
- Relevant city department
- Consultant
- International organization
- Community group
- Regional / state / provincial government
- National / central government
- Other

Scale of action
Indicate the scale of implementation for each action identified by selecting the most applicable response from the following list of values:

- Scale 1 – Concept stage
- Scale 2 – Planning stage
- Scale 3 – Pilot stage
- Scale 4 – Limited implementation
- Scale 5 – Comprehensive implementation

Level of risk mitigated
Indicate the level to which each of the actions identified is expected to mitigate climate change risks by selecting the most appropriate response from the following list of values:

- Extremely serious – action expected to mitigate risks that pose the greatest threat to your jurisdiction.
- Serious – action expected to mitigate risks that pose a significant threat.
- Less serious – action expected to mitigate risks that pose less of a threat.

Description
Briefly describe (250 words or less) the adaptation actions identified and, if necessary, provide additional details about the parties primarily responsible for their implementation. Indicate if you are intending to increase the scale of certain actions in the future, and describe how this would influence the level of climate risk mitigated by each.

A3.1 Please describe the primary levers, funding mechanisms used and capital cost for each action identified.

This table question is to understand the levers used to make adaptation actions effective, the primary funding mechanisms used by your jurisdiction to support climate adaptation actions.

Adaptation actions
This list will be automatically filled with the adaptation actions you reported in the first column of question A3.0. You are not required to provide information for each of the actions listed. However, if possible, please describe why this information was not reported or unavailable. Please add or delete table rows as needed for your entries.

Levers
Indicate the primary levers, or strategies used, to make each of the adaptation actions identified in the first column effective by selecting the most appropriate response from the following list of values:

- Incentive / Disincentive
- Program / Project
- Policy
- Procurement

Primary funding mechanisms
Indicate the primary mechanisms used to fund each of the adaptation actions identified by selecting one of the following values.

- City's own funds / savings
- Taxes / levies
- Grants / subsidies
- Loans
- Developer contributions
- Asset disposal
- Bond issuance (municipal bonds, green bonds, infrastructure bonds)
- Issue of equity
- Tolls / user charges
- Source pending identification / not yet determined
- Community-based
- Other

Capital cost
Indicate the estimated capital cost (convert to $USD) of implementing each of the actions identified by selecting the most appropriate cost range from the following list of values:

- 0 - 100.000
- 100.001 - 250.000
- 250.001 - 500.000
- 500.001 - 1,000.000

- 1,000.001 - 2,000.000
- 2,000.001 - 5,000.000
- 5,000.001 - 10,000.000
- 10,000.001+

Description
Briefly describe (250 words or less) how the policy levers selected will be used to ensure that each of the actions identified can effectively mitigate climate change risk. If needed, Provide additional information about funding mechanisms and sources, and the capital costs estimated for adaptation action.

A3.2 If applicable, please describe the performance metrics used to track and monitor the success of each action identified.

This table question is to identify the metrics or key performances indicators (KPIs) used for tracking and monitoring adaptation actions, and to understand the frequency and parties responsible for reporting progress.

Adaptation actions
This list will be automatically filled with the values you reported in the first column of question A3.0. You are not required to provide information for each of the actions listed. However, if possible, please describe why this information was not reported or unavailable. Please add or delete table rows as needed for your entries.

Metrics / KPIs
Briefly state (10 to 20 words) the primary metrics or KPIs used to track and monitor the success of each adaptation action identified in the first column.

Tracking frequency
Indicate the frequency at which the progress of each adaptation action identified is reported by selecting the most appropriate response from the following list of values:

- Annual performance
- Short term (1-2 years)
- Medium term (3-5 years)
- Long term (6-10 years)
- Horizon planning (10+ years)

Tracking responsibility
Indicate the party primarily responsible for tracking the progress of each adaptation action identified by selecting the most applicable response from the following list of values:

- Dedicated city team

- Relevant city department
- Consultant
- International organization
- Community group
- Regional / state / provincial government
- National / central government
- Other

Data made public

Indicate if data related to the tracking and monitoring adaptation actions will be made publicly available by selecting ‘Yes’, ‘No’, or ‘Do not know’.

Appendix B: Glossary

This glossary defines the specific terms referenced in the CRAFT questionnaire that ARE NOT captured within existing CDP and ICLEI guidance.

In some instances, alternative definitions are provided to those in the existing CDP and ICLEI guidance. The sources of these definitions are noted following the glossary entries.

Bold, italicized words indicate that the term is defined elsewhere in the glossary. References cited within the glossary are listed in Section 4 following the glossary terms.

The glossary is organized in three sections:

- **Key Concepts:** presents key concepts relating to city climate change adaptation planning relevant to the CRAFT reporting framework;
- **Hazards:** presents definitions of the hazard events included within the C40 City Climate Hazard Taxonomy in alphabetical order.
- **Sources:** presents sources referenced within the body of this document.

Key Concepts

Adaptation	The adjustments in ecological, social or economic systems in response to actual or expected climate stimuli and their effects or impacts. Changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change. [1] UN HABITAT.
Adaptive Capacity	The degree to which people, places, institutions and sectors are able to adapt to ***climate change impacts***. Indicated by socio-economic and environment factors and local realities that enable a city or community to adjust its system in view of current and future ***risks***. It may also include factors and conditions that leverage new ***climate*** conditions to become new opportunities. [1] UN HABITAT.
Administrative Boundary	A portion of a country or other region delineated for the purposes of administrative governance.
Annual Operating Budget	The annual operating budget for a jurisdiction sets out proposed appropriations for a fiscal year to enable the jurisdiction to function, provide services, and meet financial requirements.
Climate Adaptation Plan	A climate adaptation plan outlines the planned alterations to the city's systems in response to actual or anticipated climate change. It should cover the services and departments directly managed by the city government and may also consider the actions required by other stakeholders[6]. The aim of such a plan is to ensure that climate change risks are addressed in a preventive manner by putting in place a set of concrete measures to tackle those risks
Climate Change	Climate change refers to a change in the state of the ***climate*** that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. [2] IPCC.
Climate Change Risk and Vulnerability Assessment	A ***climate change risk*** and ***vulnerability*** assessment is used to determine the nature and extent of risks posed by climate change. This is done by analyzing potential future climate hazards and evaluating existing vulnerabilities to understand the seriousness of the potential impacts on people, assets, services, livelihoods and the environment. [3] UNEP.
Critical Asset	Assets, systems and services that are essential to the functioning of a society and economy. Systems and services may operate from the local to regional scale. Examples include energy, water supply and sanitation, transport, waste management, information and communications technology, food and agriculture, environment, industrial, commercial, residential, education, public health, community and culture, law and order, and emergency management systems and services.
Exposure	People, property, systems, or other elements present in ***hazard*** zones that are thereby subject to potential losses. [4] UNISDR, 2009.
Hazard	A phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health ***impacts***, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. [4] UNISDR, 2007. **Comment**: In CRAFT, the term 'hazard' refers to climate-related hazards that may cause loss of life, injury, or other health impacts to city populations, as well as damage and loss to the urban systems on which they depend.

[6] IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R.,
C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee,K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 688.

Hazard Group	The most generalized level of ***hazard***.
Meteorological Hazard	Events caused by short-lived/small to meso scale atmospheric processes (in the spectrum from minutes to days). [5] CRED.
Climatological Hazard	Events caused by long-lived/meso to macro scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability). [5] CRED.
Hydrological Hazard	Events caused by deviations in the normal water cycle and/or overflow of bodies of water caused by wind set-up. [5] CRED.
Geophysical Hazard	Events originating from solid earth. [5] CRED.
Biological Hazard	Events caused by the exposure of living organisms to germs and toxic substances. 5] CRED.
Hazard Type	A more detailed classification of generic ***hazard*** types. The hazard main type represents the primary cause of loss affecting a city (e.g. flood, rain, drought, and wild fire).
Impact	Effects on natural and human systems. **Comment**: In CRAFT, the term 'impact' is used primarily to refer to the effects of extreme weather and ***climate*** events on natural and human systems. Impacts generally refer to effects on lives, livelihoods, health status, ecosystems, economic, social, and cultural assets, services (including environmental), and infrastructure due to the interaction of ***climate changes*** or ***hazards*** occurring within a specific time period and the ***vulnerability*** of an exposed society or system. [6] IPCC.
Resilience	The capacity of individuals, communities and systems to survive, adapt, and grow in the face of stress and shocks, and even transform when conditions require it. [7] Rockefeller Foundation.
Risk	The potential for consequences where something of human value (including humans themselves) is at stake and where the outcome is uncertain. Risk is often represented as probability of occurrence of ***hazardous*** events or trends multiplied by the consequences if these events occur. [6] IPCC.

Hazards

Air-borne disease	An air-borne disease is one in which the pathogenic microorganism is conveyed or transmitted through the air. [8] Collins – adapted from definition for 'airborne'.
Atmospheric carbon dioxide (CO_2) concentrations	Level of carbon dioxide present in the atmosphere.
Avalanche	A large mass of loosened earth material, ***snow***, or ice that slides, flows or falls rapidly down a mountainside under the force of gravity. [9] IRDR.
Carbon dioxide (CO_2)	A naturally occurring gas, also a by-product of burning fossil fuels from fossil carbon deposits, such as oil, gas and coal, of burning biomass, of land use changes and of industrial processes (e.g. cement production). [6] IPCC.
Chemical change	A process where the chemical processes or composition of one or more substances is altered resulting in the formation of at least one new substance. [10] Random House Dictionary – adapted from definition for 'chemical change'.
Coastal flood	***Flooding*** which occurs when water is driven onto land from an adjacent body of water. This generally occurs when there are significant storms, such as ***tropical*** and ***extratropical cyclones***. [11] NOAA.
Cold wave	A period of abnormally cold weather. Typically a cold wave lasts two or more days and may be aggravated by high winds. The exact temperature criteria for what constitutes a cold wave vary by location. [9] IRDR.
Cyclone	Large-scale closed circulation system in the atmosphere above the Indian Ocean and South Pacific with low barometric pressure and strong winds that rotate clockwise. Maximum wind speed of 64 knots or more (called a ***hurricane*** in the western Atlantic and eastern Pacific and ***typhoon*** in the western Pacific). [5] CRED.
Disease	Either an unusual, often sudden, increase in the number of incidents of an infectious disease that already existed in the region (e.g. flu, *E. coli*) or the appearance of an infectious disease previously absent from the region (e.g. plague, polio). [9] IRDR.
Drought	Long lasting event; triggered by lack of precipitation. A drought is an extended period of time characterized by a deficiency in a region's water supply that is the result of constantly below average precipitation. [5] CRED.
Extratropical cyclone	A type of low-pressure cyclonic system in the middle and high latitudes (also called 'mid-latitude cyclone') that primarily gets its energy from the horizontal temperature contrasts (fronts) in the atmosphere. When associated with cold fronts, extratropical cyclones may be particularly damaging (e.g. European winter/windstorm, Nor'easter). [9] IRDR.
Extreme temperature – hot / cold	A general term for temperature variations above (extreme heat) or below (extreme cold) normal conditions. [9] IRDR.

Extreme winter conditions	(Winter storm) Damage caused by snow and ice. Winter damage refers to damage to buildings, infrastructure, traffic (esp. navigation) inflicted by ***snow*** and ***ice*** in form of snow pressure, ***freezing rain***, frozen waterways etc. [5] CRED.
Flash / surface flood	Heavy or excessive rainfall in a short period of time that produce immediate runoff, creating ***flooding*** conditions within minutes or a few hours during or after the rainfall. [9] IRDR.
Flood	A general term for the overflow of water from a stream channel onto normally dry land in the floodplain (***river (riverine*** *or* ***fluvial) flooding***), higher-than normal levels along the coast and in lakes or reservoirs (***coastal flooding***) as well as ponding of water at or near the point where the rain fell (***flash floods***). [9] IRDR.
Fog	Water droplets that are suspended in the air near the Earth's surface. Fog is simply a cloud that is in contact with the ground. [9] IRDR.
Forest fire	A type of ***wild fire*** in a wooded area. [9] IRDR.
Groundwater flood	The emergence of groundwater at the ground surface away from perennial river channels or the rising of groundwater into man-made ground, under conditions where the 'normal' ranges of groundwater level and groundwater flow are exceeded. [12] BGS.
Hail	Solid precipitation in the form of irregular pellets or balls of ***ice*** more than 5 millimeters (0.2 inches) in diameter. [9] IRDR.
Heat wave	A period of abnormally hot and/or unusually humid weather. Typically a heat wave lasts two or more days. [9] IRDR.
Heavy snow	Snowfall accumulating to 10 centimeters (4 inches) or more in depth in 12 hours or less; or snowfall accumulating to 15 centimeters (6 inches) or more in depth in 24 hours or less. [11] NOAA.
Hurricane	*See* ***'Cyclone'***.
Inundate (inundation)	To cover completely with water. [8] Collins. [NB: As in water-logging.]
Insect	Any similar invertebrate, such as a spider, tick, or centipede. [8] Collins.
Insect infestation	The pervasive influx, swarming and/or hatching of insects affecting humans, animals, crops, and perishable goods. Examples are locusts and African Bees. [9] IRDR.
Land fire	A type of wildfire in a non-wooded area such as bush, grassland, scrub or pasture. [9] IRDR– adapted from definition for 'forest fire'.
Landslide	Any moderate to rapid soil / rock movement incl. lahar, mudslide, debris flow. Movement controlled by gravity and the speed usually ranges between slow and rapid, but not very slow. It can be superficial or deep, but the materials have to make

	up a mass that is a portion of the slope or the slope itself. The movement has to be downward and outward with a free face. [5] CRED.
Lightning	A high-voltage, visible electrical discharge produced by a ***thunderstorm*** and followed by the sound of thunder. [9] IRDR.
Mass movement	Any type of downslope movement of earth materials. [9] IRDR.
Microorganism	Any organism, such as a bacterium, protozoan, or virus, of microscopic size. [8] Collins.
Monsoon	A seasonal wind of southern Asia that blows from the southwest in summer, bringing heavy rains, and from the northeast in winter. [8] Collins.
Ocean acidification	Reduction in the pH of the ocean over an extended period, typically decades or longer, which is caused primarily by uptake of carbon dioxide from the atmosphere, but can also be caused by other chemical additions or subtractions from the ocean. [2] IPCC.
Rain storm	A storm with heavy rain. [13] Oxford Dictionaries Online.
River flood	A type of flooding resulting from the overflow of water from a stream or river channel onto normally dry land in the floodplain adjacent to the channel. Also called: 'riverine' or 'fluvial' flood. [14] IRDR.
Rockfall	Quantities of rock or stone falling freely from a cliff face. It is caused by undercutting, weathering or permafrost degradation. [5] CRED.
Salt water intrusion	Displacement of fresh surface water or groundwater by the advance of salt water due to its greater density. This usually occurs in coastal and estuarine areas due to decreasing land-based influence (e.g. from reduced runoff or groundwater recharge, or from excessive water withdrawals from aquifers) or increasing marine influence (e.g. relative sea-level rise). [6] IPCC.
Sea level rise	Relative sea level as measured by a tide gauge with respect to the land upon which it is situated. [6] IPCC.
Severe wind	The severity of wind events is location dependent. The US National Weather Service of the National Oceanic and Atmospheric Administration defines 'high winds' as sustained wind speeds of 64 kilometers per hour (40 miles per hour) or greater lasting for 1 hour or longer, or winds of 93 kilometers per hour (58 miles per hour) or greater for any duration. [11] NOAA.
Storm	A violent weather condition. [8] Collins.
Storm surge	Coastal flood on coasts / lake shores induced by wind. The rise of the water level in the sea, an estuary or lake as result of strong wind driving the seawater towards the coast. This so-called wind setup is superimposed on the normal astronomical tide. The mean high water level can be exceeded by 5 meters (16 feet) and more. [5] CRED.
Subsidence	Downward motion of the Earth's surface relative to a datum (e.g. the sea level). Subsidence (dry) can be the result of: geological faulting, isostatic rebound, human impact (e.g. mining, extraction of natural gas) etc. Subsidence (wet) can be the

	result of: karst, changes in soil water saturation, permafrost degradation (thermokarst) etc. [5] CRED.
Thunderstorm	A severe storm or thunderstorm is the result of convection and condensation in the lower atmosphere and the accompanying formation of a cumulonimbus cloud. A severe storm usually comes along with high winds, heavy precipitation (rain, sleet, ***hail***), thunder and lightning. [5] CRED.
Tornado	A rotating column of air (vortex) that emerges out of the base of a cumulonimbus cloud and has contact to the Earth's surface. Typically, it forms during a severe convective storm in so-called supercells and is often visible as a funnel-shaped cloud. Tornadoes are usually short-lived, lasting on average no more than 10 minutes. They can generate wind speeds above 400 km/h and are considered the most destructive weather phenomenon. Other names for this weather phenomenon are twister, waterspout (over open water). [5] CRED.
Tropical storm	A tropical system in which the maximum sustained surface wind ranges from 34 to 63 knots (39 to 73 miles per hour). These systems are also intense rainfall producers, but often cause enough wind and waves to cause some beach erosion and minor boat damage. [14] NOAA.
Typhoon	*See '**Cyclone'**.*
Vector-borne disease	A vector-borne disease is one in which the pathogenic microorganism is transmitted from an infected individual to another individual by an arthropod or other agent, sometimes with other animals serving as intermediary hosts. [15] Earth Observatory.
Water-borne disease	A water-borne disease is one in which the pathogenic microorganism is carried or transmitted by water, especially drinking water. [15] Earth Observatory – adapted from definition for 'vector-borne disease' and [16] Merriam-Webster – adapted from definition for 'waterborne'.
Waterlogging	Land full of water and almost covered by a layer of it. [18] Cambridge Dictionaries Online.
Water scarcity	A long period of abnormally low rainfall, especially one that adversely affects growing or living conditions. [8] Collins.
Wave action	Wind-generated surface waves that can occur on the surface of any open body of water such as oceans, rivers and lakes, etc. The size of the wave depends on the strength of the wind and the travelled distance (fetch). [9] IRDR.

Sources

The sources below are listed and numbered in the order that they are first referenced within the glossary.

Where sources provide a specific year in reference to the establishment of a definition, this is noted in within the glossary (e.g. "[6] UNISDR, 2007" references that the definition was established in 2007).

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