CLImate ACTions Prioritization (CLIMACT Prio)

Capacity Building and Decision Support Tool

Manual v.3

Introduction

The need to tackle the risks posed by the impacts of climate change to development and poverty reduction goals has spurred a growing range of tools to integrate adaptation into development co-operation and planning. For a long time development planners and project managers have used a wide variety of tools to manage a broad range of environmental risks, including those posed by climate variability. Some of these tools have also now been modified to take into account the risks posed by climate change.

At the same time, there has been a recent emphasis on developing more dedicated tools which have an explicit focus on screening for climate change risks and on prioritizing adaptation actions in order for local governments to conduct local climate change adaptation action plans.

These kinds of tools can be used both for informative decision making and capacity building purposes. It is within this set of tools that CLIMACT Prio tool was developed. CLIMACT Prio Tool targets local governments, urban planners, municipality officials, city managers and academic and research institutions in the field of climate change in urban areas.

Description

CLIMACT Prio is a climate awareness, decision support and capacity building tool for screening and prioritizing of local climate change actions. CLIMACT Prio utilizes a multi-criteria approach to assist decision makers and urban planners to identify a wide range of decision criteria and set priorities among objectives while performing an analysis and assessment of climate change (mitigation or adaptation) actions.

This method does not necessarily identify an “optimal” option, but rather requires the user to draw conclusions by looking at different components of the whole picture of the assessment and prioritization process, while seeking a consensus decision between stakeholders with different needs, concerns, and priorities.

CLIMACT Prio tool provides an interactive format to help users structure and define the decisions under consideration. The tool asks the user to enter information through a guided menu of instructions and uses a menu-driven graphic representation of results for the evaluation of climate change actions.

The user first identifies specific actions to be screened according to their feasibility and then selects the impact assessment criteria and objectives that will be used to assess the selected actions. While following the climate actions prioritization process, the users rates the relative importance of criteria and assign scores (qualitative and quantitative) to describe how each option meets each criterion.

Objectives and Aims of the Tool

The aim of this tool is to provide support to decision makers to identify and prioritize local mitigation actions at a city level (in a given case). The analysis is undertaken not only to identify mitigation actions but also to prioritize which actions should be implemented first (prioritization). Keep in mind that the aim of the exercise is not to arrive at optimal climate change actions, but rather we require you to draw conclusions by looking at how each mitigation action performs against criteria that Local Governments may hold most valuable.

CLIMACT Prio tool applies a Multi Criteria Analysis (MCA) evaluation. The process of applying a Multi-Criteria Analysis generates a lot of discussion because it entails the identification of a wide range of decision criteria and contemporarily set priorities among competing sustainability objectives. Engaging in this exercise will open a window into decision making for delivering low carbon energy futures globally.

The User's Manual of the CLIMACT Prio tool will guide you through the various steps of the analysis and can assist you to present the results of the assessment in a graphical form.

How to use this manual

This manual provides a useful demonstration of the kind of analysis that can be produced using the CLIMACT Prio tool. Before embarking on any analysis we would recommend a thorough review of this document. The experience of the cities involved in using the CLIMACT Prio tool is likely to be valuable in developing the approach to selecting adaptation actions and engaging local stakeholders.

Tool's Set Up

- To run CLIMACT Prio, the user needs Microsoft Windows Office 2007 and Microsoft Excel 2007. The tool is not guaranteed to work correctly in other versions of Excel. The tool uses Excel Macros that need to be enabled in order the tool to operate correctly with automated features.

- In order to protect against the introduction of accidental errors we recommend that users keep a "safe" version of the tool separate from the working version(s). We also recommend that users save their work frequently and regularly save backup copies of working files in order to track changes and to protect against the introduction of errors.

- The CLIMACT Prio tool allows users to estimate and compare performance of different actions/measures against several criteria. A droplist of actions and measures is under development and will be stored in the Excel workbook where users can choose some of these and fully incorporate them into the CLIMACT Prio analysis.

Structure of the tool

The CLIMACT Prio tool is structured in six main steps:

1) **Identification of preliminary wish-list of actions** based on cities vulnerability profiles, broader development goals and visions (this step forms the basis to use the tool)
2) **Feasibility Assessment**: Consists in the screening of each action identified in the wish-list against pre-defined feasibility criteria and formulation of a shortlist of actions to take further into the assessment
3) **Evaluation Criteria Identification:** Based on city vulnerability profiles, broader development goals and the preliminary list of adaptation actions, evaluation criteria are identified.
4) **Impact assessment:** Consists of experts' judgments and impact assessment matrix along with normalized scores and graphs;
5) **Weighting of criteria:** Consists in the weighting of criteria by the stakeholders and the generation of relevant graphs;
6) **Results:** Consists of the presentation of weighted scores, final ranking and the generation of relevant graphs

Prioritization of local climate change mitigation actions
Manual of instructions

Module 0 – Identification of relevant background data

When identifying actions to respond to current and future climatic risks it is important to take into account options to reduce greenhouse gas emissions (GHGs). Making an inventory of GHGs emission is the first step to understand where and how urban areas generate GHGs, track emission trends, establish baseline for developing action plan, track progress in reducing emissions. To be able to run the CLIMACT Prio the city should have: 1) conducted an emissions profile; 2) identified sectors of interest for emissions reduction and 3) access to a city vision or strategic plan. Based on these three sources of information, a preliminary wishlist of alternative mitigation actions should be generated in consultation with key stakeholders (see next module).

Module 1a – Identification of alternative mitigation actions (indicative time 1 hour, 15 minutes including 1b and 1c)

Based on which sectors have the largest potential for mitigating GHG emissions in each city and other relevant priorities, choose an initial list of alternative mitigation actions based on the menu of actions provided and on your own knowledge. They can be traditional mitigation actions used in the city, experience within government technical services, results of national or regional research institutes as well as on information available at the international level. Based on the distinction between emissions sources (as seen in ICLEI's Carbon*n* database), the actions are distinguished between Government and Community level actions/policies. Since these mitigation actions will be implemented by stakeholders, stakeholders need to be involved at all stages of the process, development and approval of the actions - which is the main argument for the use of participatory approaches. It is necessary to have a rough idea of the potential constraints (social, technical, political or other) likely to limit the implementation of mitigation actions.

- For each entry choose whether you are selecting an action/policy at Government or Community level (Fig.1)
- For each entry select the sectors with the highest contribution to city's GHG emissions (Fig.2) and choose appropriate mitigation policies/technologies out of the menu of actions (Fig.3)
- Based on your own knowledge, you can add more actions by choosing 'Other' in the dropdown menu (Fig.4), scroll to the end of the page and clicking on either 'If other is selected click here to add the new government related action' if it is a government action or click on 'If other is selected click here to add the new community related action' (Fig. 5). You will be redirected to a sheet called 'Government Actions' where you can add a new action in the cell designated 'Other'.
- For each action indicate the relevant sector and a time frame for implementation.
- Populate your initial list of mitigation actions (the number of actions can be substantial) that could contribute both to the reduction of GHG emissions and achievement of other city's development objectives.

Figure 1 Choose between Government and Community level

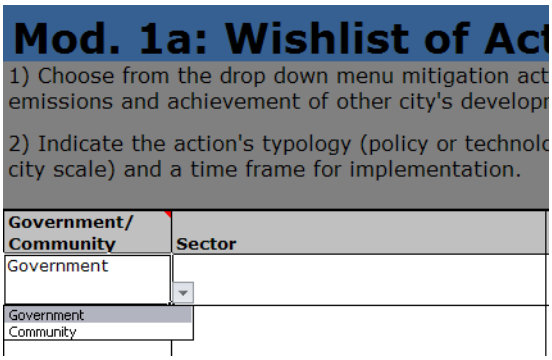


Figure 2 Select relevant sectors

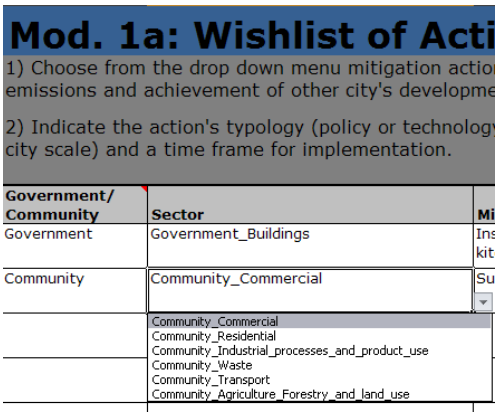


Figure 3 Select appropriate mitigation actions/policies

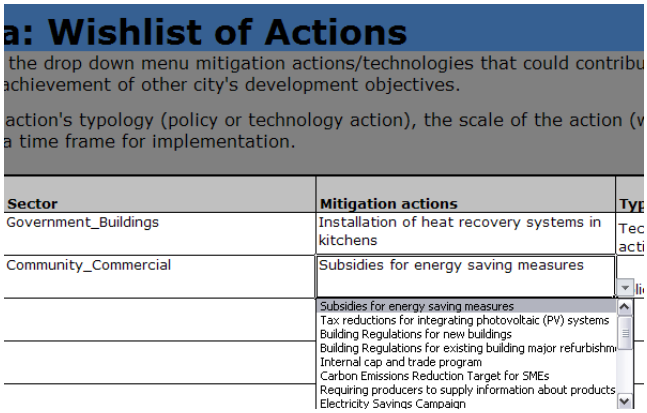


Figure 4 Select 'Other' to add more actions

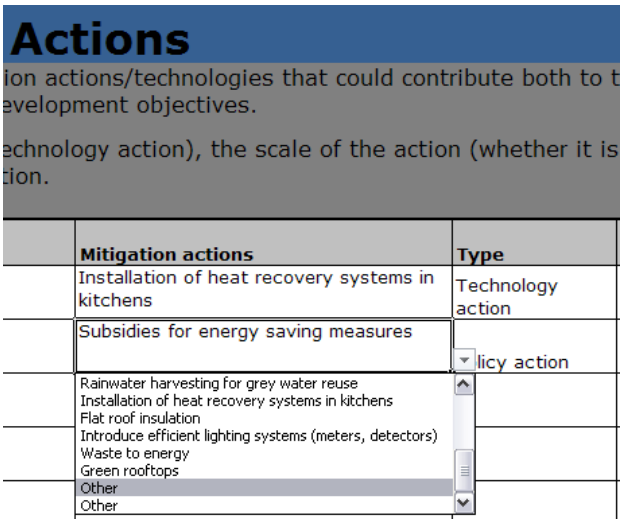
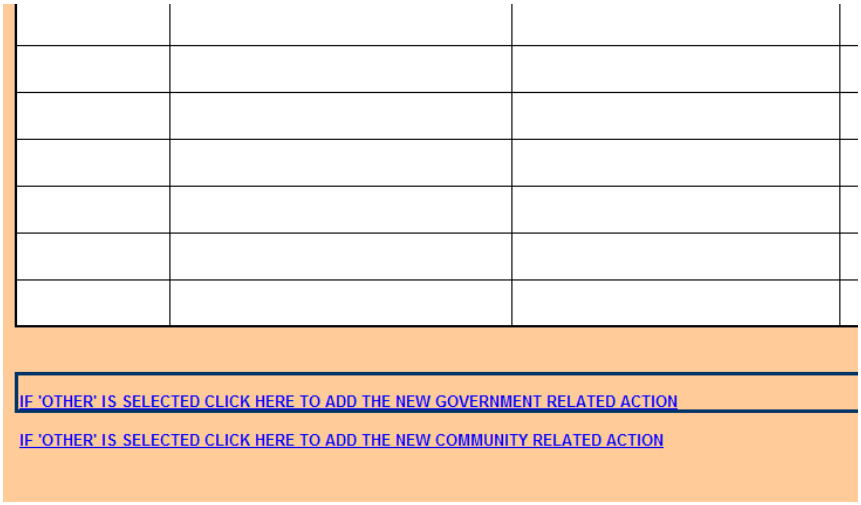


Figure 5 Scroll to the end of the table and select one of the two options to enter a new action



Module 1b – Screening and ranking of alternative mitigation actions

Narrow down the initial long list of alternative mitigation actions identified in Step 1a through an initial screening process. This task will screen out mitigation actions that may not be viable for implementation and will bring forward alternative mitigation actions for a more detailed assessment.

- First study the following feasibility and impact criteria – with their corresponding descriptions and scoring scale - adapted from UN Habitat (2014).

	Criteria	High	Medium	Low
Feasibility Criteria	**Public acceptability:** *Would local residents accept this option?*	Majority of residents would accept this option	A limited majority of residents would	Low support of residents would for this option

			accept this option	
	Implementer acceptability: *Would other stakeholders (other than government) accept this option?*	Majority of implementers would accept this option	A limited majority of implementers would accept this option	Low support of implementers would for this option
	Technical feasibility: *Will necessary designs, skills and competencies, maintenance support be available for this option?*	Resources to develop designs, skills and competencies, and maintenance support are available	Limited resources to develop designs, skills and competencies, and maintenance support	No available resources to develop designs, skills and competencies and maintenance support
	Ease of implementation: *Can it be implemented at the local government level, or does it depend upon state/provincial or national support?*	City can implement this option without external support	City can implement this option with some support	City cannot implement this option without external support
	Financial viability: *Is it a financially realistic option? Does the city have funding or potential access to funding to cover the costs?*	Financially realistic with available funding at city level	Limited funding opportunities at city level	Expensive and limited funding opportunities at city level
	Mainstreaming potential: *Could it be integrated with existing local government planning and policy development?*	Yes, easily and fully through many plans and strategies	Yes, partly but with more time and through more limited plans and strategies	Relatively limited potential, would require additional activities
Impact Criteria	**Effectiveness:** *How well would this option work on reducing GHGs emissions (in relation to the other actions)?*	GHGs emissions will be reduced to a large extent (in relation to the other actions)	GHGs emissions will be reduced to a moderate extent (in relation to the other actions)	GHGs emissions will be reduced to a limited extent (in relation to the other actions)
	Multi-sectoral and multi-objective: *Would this option address objectives in other sectors?*	Yes, significant cross over with other sectors and objectives	Some cross over with other sectors and objectives	Little cross over with other sectors and limited impact on other objectives

- Evaluate each alternative mitigation option against each of the seven (7) feasibility and impact criteria by providing a score using the following scale: High, Very High, Medium, Very Low, and Low.

- In a real training situation, the evaluation should be based on your research related to the feasibility and impact of identified mitigation options. The research can be based on experiences from other cities, best practices, scientific studies published in academic journals, government reports, private or public institutions working in the field. For the purpose of this training, the feasibility assessment will be mostly done based on trainees existing knowledge and internet sources (such as Climate Tech WIKI). In the future the aim is to have an

evolving repository of feasibility data for mitigation (and adaptation actions) that trainees can access automatically. Steps in this direction are currently undergoing.

Figure 6 Example of initial screening of mitigation actions. Rank each action against both feasibility and impact criteria

Step 1b: Feasibility Assessment - Initial Screening of Mitigation Actions

	Feasibility criteria					Impact Criteria	
Mitigation Actions	Stakeholder Acceptability	Technical Feasibility	Ease of Implementation	Financial feasibility	Mainstreaming Potential	Effectivenes	Multi-sectoral/objective
Solar Hot Water Systems							
Electric Vehicles							
Green Energy Supply							
Waste to Energy							
Street Lighting							
Cogeneration							
Bus Rapid Transit System							
Houses Retrofitting							

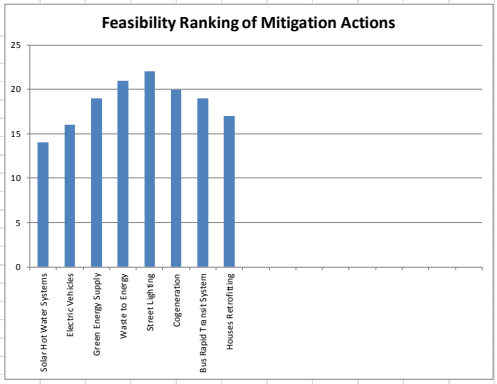
Module 1c: Feasibility ranking of mitigation actions

At the end of step 1b observe how all the scores for each alternative mitigation action add up, as well as the overall ranking of the mitigation actions and the feasibility index (this index captures the average score over the five feasibility criteria). You can choose to use the outcome of the feasibility index as a criterion in your impact matrix in module 4.

Figure 7 Example of feasibility ranking of mitigation actions

Step 1c: Feasibility Ranking of Mitigation Actions

	Feasibility criteria					Impact Criteria				
Mitigation Actions	Stakeholder Acceptability	Technical Feasibility	Ease of Implementation	Financial feasibility	Mainstreaming Potential	Effectivenes	Multi-sectoral/objective	Total	Ranking	Feasibility Index
Solar Hot Water Systems	1	4	3	2	1	1	2	14	8	0,7
Electric Vehicles	2	4	4	2	1	1	2	16	7	0,9
Green Energy Supply	3	4	3	5	1	1	2	19	4	1,1
Waste to Energy	4	4	4	5	1	1	2	21	2	1,2
Street Lighting	5	4	4	5	1	1	2	22	1	1,3
Cogeneration	5	1	3	4	4	1	2	20	3	1,1
Bus Rapid Transit System	5	2	4	2	3	1	2	19	4	1,1
Houses Retrofitting	5	3	3	2	1	1	2	17	6	0,9



Module 2 Selection of mitigation actions

Based on the mitigation actions that ranked the highest in the feasibility assessment, choose a maximum of **6 to 7** mitigation actions to carry on in this exercise and copy/paste them in Step 2. In a real training situation, trainees should also fill in the feasibility part of the climate action template provided, where they will explain the outcomes of the feasibility and provide justifications for each selected action.

Figure 8 Example of mitigation actions for multiple sectors

STEP 2 Mitigation Actions

1) Check the rankings of the mitigation actions in the feasibility assessment,
2) Choose up to 6 to 7 of the highest ranked mitigation actions for further assessment

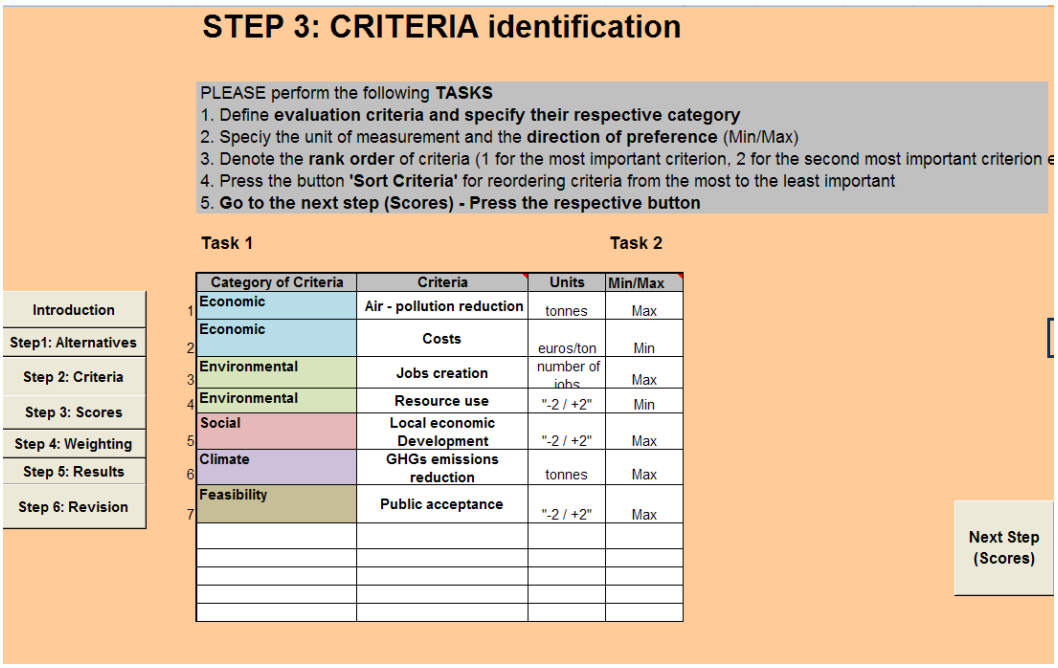
No	Mitigation actions	Type	Time Frame	Description	Source
1	Solar Hot Water Systems	Residential	Short Term		
2	Electric Vehicles	Transport	Medium Term		
3	Green Energy Supply	Energy	Long Term		
4	Waste to Energy	Waste Management	Medium Term		
5	Street Lighting	Energy	Short Term		
6	Cogeneration	Energy	Long Term		
7	Bus Rapid Transit System	Transport	Medium Term		

Module 3 – Criteria identification (Indicative time 1 hour)

Define the evaluation criteria to be used in the CLIMACT Prio tool to evaluate the impacts and benefits of the mitigation actions. The criteria selected can be of a diverse nature and should relate to broader local governments' priorities and objectives (the latter can be informed, among others, by the feasibility index). The criteria should be SMART: simple, measurable, available, relevant and time bound. Especially if the analysis is done in a participatory manner the criteria should be simple and understandable by all stakeholders and should be relevant across all mitigation actions. This step is important, as the final prioritization of the actions will be determined based on the evaluation criteria selected.

- Discuss within the group possible evaluation criteria for the mitigation actions you identified.
- Try to avoid overlap between criteria but also identify a comprehensive set of evaluation criteria.
- The maximum number of criteria (objectives) you can choose is **6 to 7.**
- The scale of measurement that has been defined is qualitative from "1 to 10" or "1 to 5" where 1 indicates very low performance and 10 (or 5) very high performance of the actions

Figure 9 Example of criteria identification



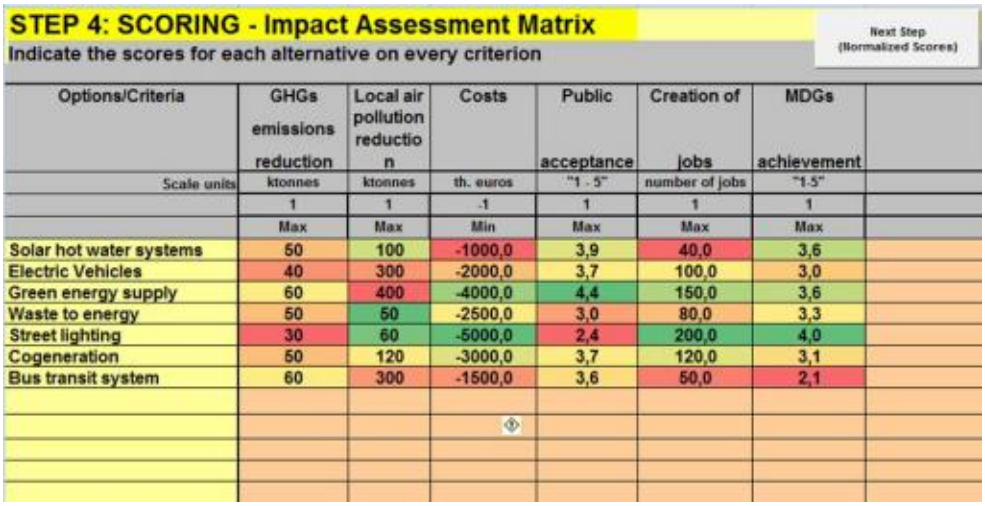
Module 4 – Scoring of mitigation actions (Impact Assessment Matrix) (Indicative time 2 hours)

One must assign scores for each mitigation action against the selected evaluation criteria. Normally this step is based either on economic, social, environmental and mitigation impact studies or on experts' judgments and modeling exercises. In a real training situation, trainees should learn more about each of the 6 to 7 mitigation actions chosen; this involves evaluating their advantages and disadvantages, costs and benefits and financing options by researching experiences from other cities, best practices, scientific studies published in academic journals, government reports and official institutions' blogs.

For the purpose of this training, the impact matrix will be mostly done based on trainees existing knowledge and internet sources (such as Climate Tech WIKI). During a real training situation, trainees should be asked to fill in knowledge gained on new mitigation actions in the template for climate actions. In the future the aim is to have an evolving repository of benefits/impacts data for mitigation (and adaptation actions) that trainees can access automatically. Steps in this direction are currently undergoing.

To minimize ambiguity and subjectivity, scoring should be done based on a clearly understood and agreed upon scale. In this regard, a smaller scoring scale is easier to use and is less subjective than a larger scale (for instance, values of 55 to 80 could denote an important impact on a scale of 0 to 100, where 2 is the only value available on a scale of 1 to 3). The importance of a smaller scale is even greater when the analysis is conducted in a participatory manner.

Figure 10 Example of Impact Assessment Matrix



STEP 4: SCORING - Impact Assessment Matrix

Indicate the scores for each alternative on every criterion

Next Step (Normalized Scores)

Options/Criteria	GHGs emissions reduction	Local air pollution reduction	Costs	Public acceptance	Creation of jobs	MDGs achievement
Scale units	ktonnes	ktonnes	th. euros	"1 - 5"	number of jobs	"1-5"
	1	1	1	1	1	1
	Max	Max	Min	Max	Max	Max
Solar hot water systems	50	100	-1000,0	3,9	40,0	3,6
Electric Vehicles	40	300	-2000,0	3,7	100,0	3,0
Green energy supply	60	400	-4000,0	4,4	150,0	3,6
Waste to energy	50	50	-2500,0	3,0	80,0	3,3
Street lighting	30	60	-5000,0	2,4	200,0	4,0
Cogeneration	50	120	-3000,0	3,7	120,0	3,1
Bus transit system	60	300	-1500,0	3,6	50,0	2,1

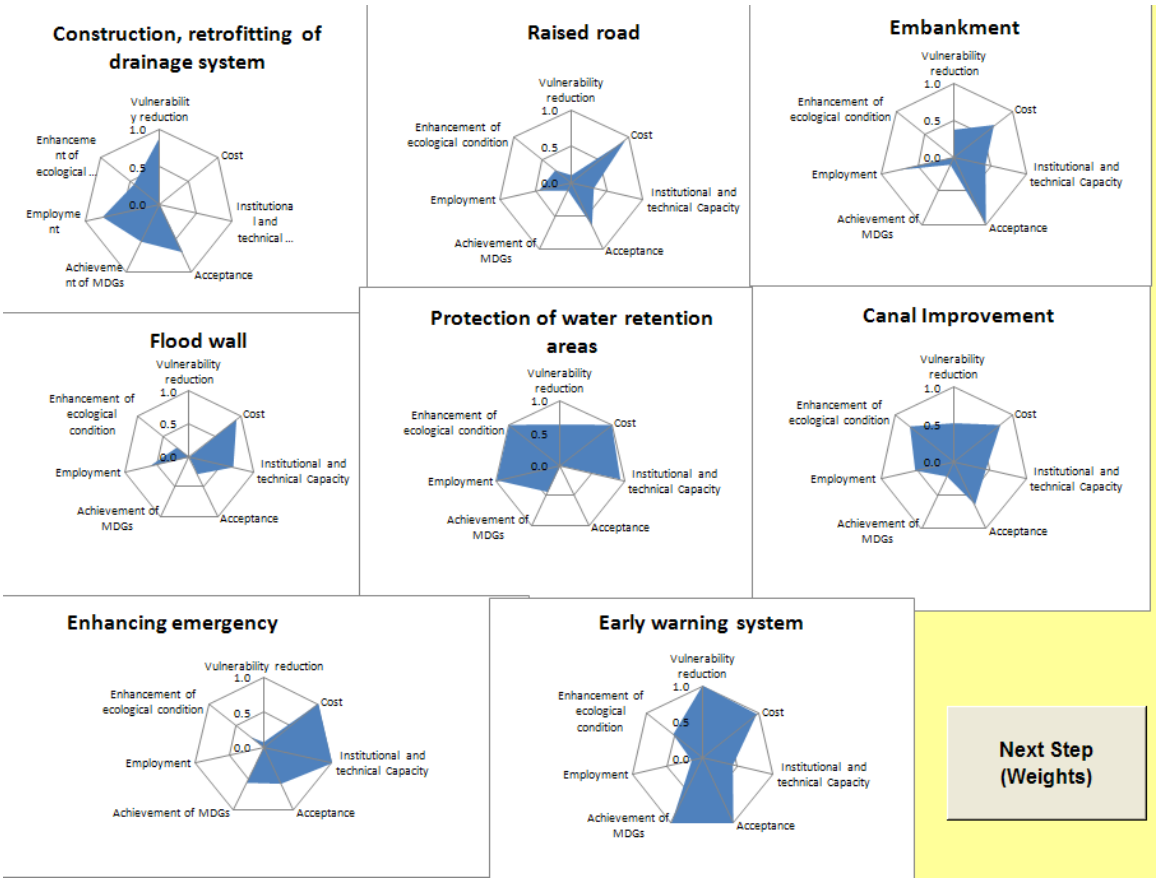
Standardization (Automatically performed by the tool)

If the selected criteria do not all use the same scoring scale, one must standardize the values in order to be able to compare the scores. Standardization can be done on a 0 to 1 or to a 0 to 100 scale. Standardization is done by linear interpolation. The standardization is being performed automatically for this exercise by the CLIMACT Prio tool.

Verify that all the criteria scores are in the same direction (i.e. that higher numbers represent a positive outcome and lower numbers represent less positive or negative outcomes or vice versa). For instance, when scoring for costs and benefits one must ensure that the action with the greatest benefits receives the highest positive score, while the option with the greatest costs receives the lowest score (as this is a negative attribute). All the scoring scales must be in the same direction (from negative to positive values).

The standardization is performed automatically by the CLIMACT Prio tool. Observe the graphs obtained based on the normalized initial results (“graphs-radar” spreadsheet)

Figure 11 Example of radar graphs of normalized scores of actions showing how each action meets selected criteria



Module 5 – Weighting of criteria (Indicative time 45 min)

In this step, the group undertaking the analysis, in accordance with experts and stakeholders, must decide if any of the criteria should be given a higher or lower weight with respect to the others. Weighting of criteria should be at the heart of group discussions, as it may change the ranking of mitigation actions.

If the ranking of mitigation actions changes as a result of modifying the criteria weights, the groups should analyze and discuss the results to ensure that everyone agrees on certain weights (factors of relative importance) and the final ranking of mitigation options.

- First rank the criteria from most important to least important. The most important (first ranked) criterion will be denoted by 1, second most important criterion by 2 and so on.
- Provide your weighting (relative importance) preferences verbally by indicating the level of importance using the scale: very low, low, moderate, high, very high.
- Then provide your weighting preferences arithmetically. For each type of verbal expression of your preferences there is a short arithmetic range that is associated with (See Table 1).

Table 1: Level of importance with associated importance values

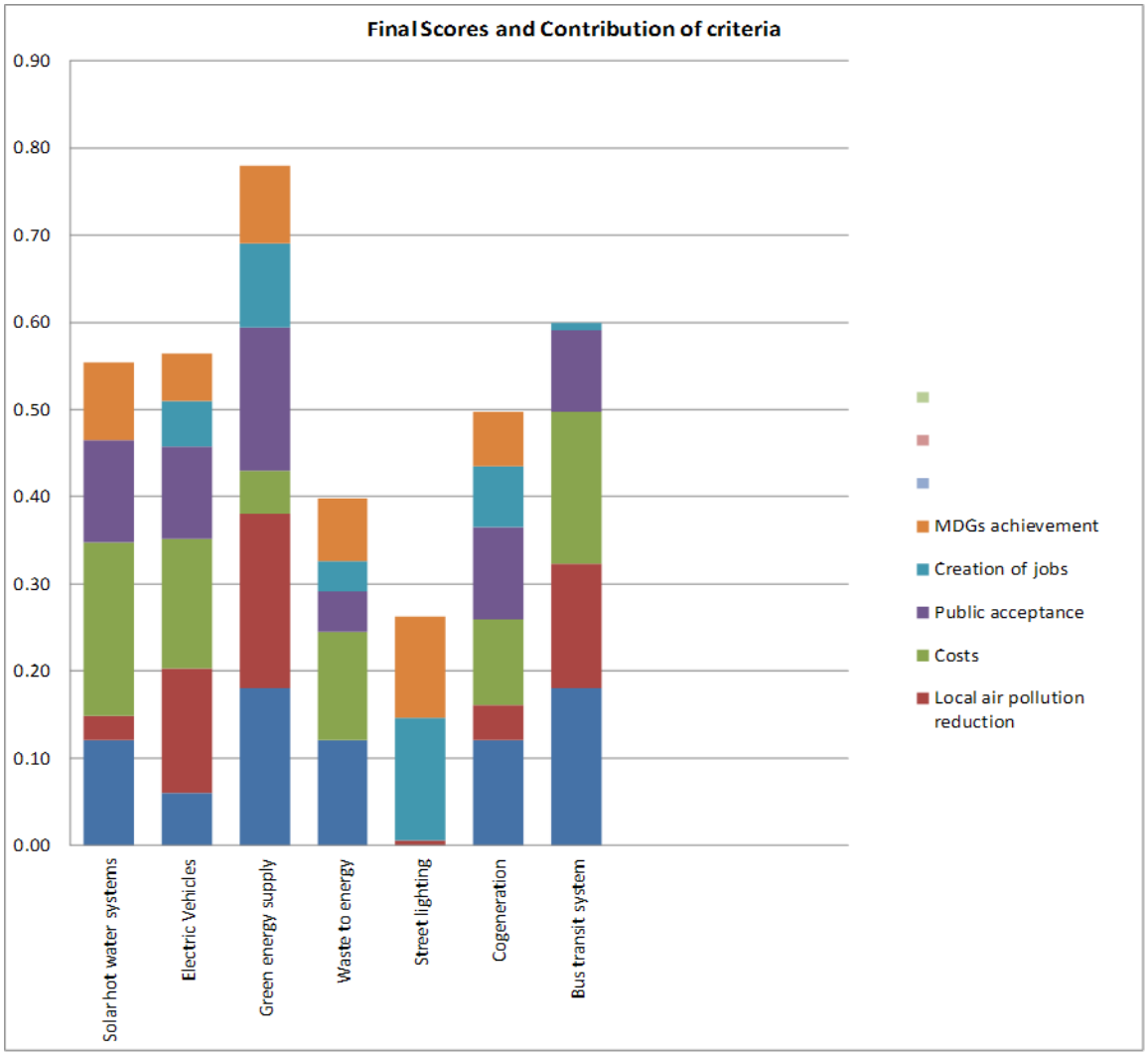
Level of Importance	Values of importance	
Very High	100	90
High	80	70
Moderate	60	50
Low	40	30
Very Low	20	10

Figure 12 Example of criteria weighting

Module 6: Prioritization of actions (Indicative time 15 minutes)

Observe the results based on the assigned weights. How can the final ranking be explained? Which criteria contribute mostly to the highest ranked alternatives? Which criteria (objectives) will be met by the actions? What does this prioritization of mitigation actions imply for the city's climate mitigation policy? You can also observe the graphs of the performance of every mitigation option on the last spreadsheet (graphs-options).

Figure 13 Final score and graph showing the mitigation action that best meets local governments' criteria



Advice: For every step of the exercise, always discuss with your group mates and use graphical means (e.g. board, paper) in order to communicate your ideas and perspectives. Decide as a group how to address and answer the questions at every step of the exercise and finally fill in the relevant information to the CLIMACT Prio Tool.

Note: Please do not delete or add any rows or columns while working with the CLIMACT Prio tool.

GOOD LUCK AND ENJOY!