Clima-Med SEACAP Preparation Manual

A Step-by-Step Guide to Developing a Sustainable Energy Access and Climate Action Plan

Clima–Med
Acting for Climate in South Mediterranean

Funded by the European Union

The “SEACAP Preparation Manual” was developed by experts from the Clima-Med project team, led by Naguib Amin, Project Team Leader.

The core authors are:

Naguib Amin
Oussama Kaassamani
Myriam Makdissi

With the contribution of Alexandra Papadopoulou and the support of Rania Kassamani, Paul Tabet, and Malek Mardam Bek.

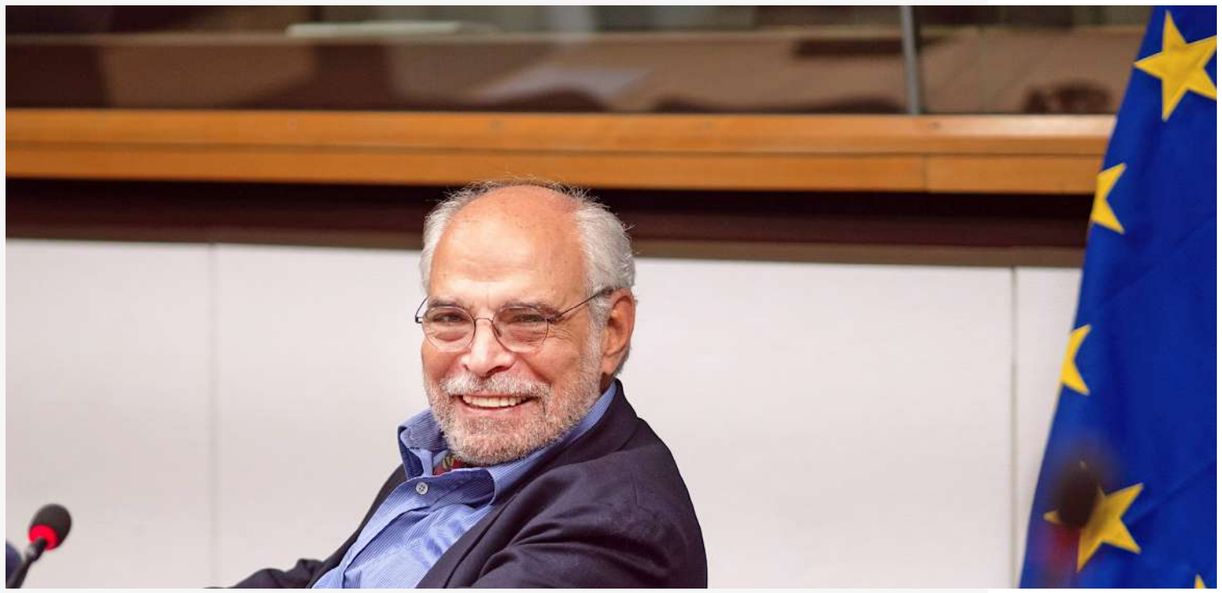
Table of Contents

List of Tables

List of Abbreviations

AFLOU	Agriculture, Forestry, and Other Land Use
API	Application Programming Interface
BEI	Baseline Emission Inventory
BAU	Business-as-usual scenario projected
CAF	Capital Approach Framework
CAP	Citizens Awareness Plan
CC	Climate Change
CFG	Clima-Med Climate Finance Guidebook
CoM	Covenant of Mayors
CoM Med	Covenant of Mayors for the Mediterranean
CRF	Common Reporting Framework
EE	Energy Efficiency
EF	Emission Factor
EPC	Energy Performance Contract
GCoM	Global Covenant of Mayors
GHG	Greenhouse Gases
KPIs	Key Performance Indicators
LA	Local Authority / Sub-national Authority or Local Government
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre
MSW	Municipal Solid Waste
NDC	Nationally Determined Contribution
NEFE	National Emission Factor for Electricity Consumption
NSSF	National Social Society Fund
PPA	Power Purchase Agreement
RCP	Representative Concentration Pathways
RES	Renewable Energy Sources
RVA	Risks and Vulnerability Assessment
SC	SEACAP Coordinator
SE	Sustainable Energy
SEACAP	Sustainable Energy Access and Climate Action Plan
SSC	SEACAP Steering Committee
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SSM	SEACAP Support Mechanism
STT	SEACAP Technical Team
SWDS	Solid Waste Disposal Sites
SWM	Solid Waste Management
UNDCCC	United Nations Framework Convention on Climate Change
VTMS	GPS-based Vehicle Tracking & Monitoring System

PREFACE



The “SEACAP Preparation Manual” is the result of years of dedicated efforts by experts involved in the Cleaner Energy Saving Mediterranean Cities “CES-Med” project (2013-2018) and the Acting for Climate in South Mediterranean “Clima-Med” project (2018-2025). It was developed alongside the preparation of “Sustainable Energy Access and Climate Action Plans” (SEACAPs) for more than 100 municipalities and cities, in close collaboration with their presidents and dedicated staff.

The successful preparation of these numerous SEACAPs was achieved through practical on-the-job training. The purpose of this Manual is to share our insights and experiences, or our “preparation recipe”, with the many local authorities currently designing their Plans, and certainly, to motivate and encourage others to follow suit.

We assure future users of this Manual that a SEACAP is not only a highly effective tool for designing projects but also an essential one for securing their funding and implementation.

The authors dedicate this Manual to those leaders, mayors, technicians, and civil society actors who have worked with us, with effort, compassion, and dedication to build a better society for millions of citizens.

We hope you will find this Manual to be a valuable resource to effectively enhance your capacity to mitigate and adapt to the impacts of climate change, while implementing sustainable urban solutions in your cities.

Finally, we wish you the full benefit of this work, in securing a resilient and sustainable future for the countries across the Southern Mediterranean.

Naguib Amin, Clima-Med Team Leader

INTRODUCTION AND SUMMARY

WHAT IS A SEACAP?

A SEACAP, or Sustainable Energy Access and Climate Action Plan, defines the specific Climate Change (CC) strategy and actions planned by a local authority (LA) within its boundaries and in its multiple forms, such as a municipality, county, special district, city, governorate, region and other variables of sub-national government.

The SEACAP serves as a roadmap for achieving climate goals and enhancing environmental sustainability locally, following national policies, directives, and global climate objectives.

The SEACAP is a practical working tool that should evolve and adapt to changing conditions, emerging needs, and technological advancements. Thus, it should be regularly reviewed and updated to remain relevant and applicable.

WHY IS A SEACAP NECESSARY

A SEACAP is an essential tool for sub-national authorities as it allows them to navigate the complex landscape of CC and take a proactive approach to face its impacts. It empowers them to make informed decisions based on an assessment of current conditions, setting realistic goals, and prioritised actions for energy access, climate mitigation and adaptation based on baseline emission inventories with precise emissions reduction targets, aligning their local climate action with the national NDC and climate policies.

THE SEACAP AS A TOOL FOR NDC MAINSTREAMING

Resorting to the use of the SEACAP as a tool to plan and implement climate actions at the sub-national level is meant to be part of a national system to mainstream the application of its NDC and climate policies from their central level to its handling by local and regional authorities.

Given that, the Clima-Med project has promoted and supported the creation of a national SEACAP Support Mechanism (SSM) as a state instrument to institutionally, technically, and financially support the climate role of subnational authorities, raising their capacities to prepare SEACAPs, fund, and implement their actions.

METHODOLOGY OF THE SEACAP PREPARATION MANUAL

The Clima-Med project team has prepared the Manual based on its experience supporting the production of SEACAPs for more than 100 local governments. The proposed methodology and steps align with the approach and requirements of the EU Joint Research Centre (JRC) and the Common Reporting Framework (CRF) of the Global Covenant of Mayors' (GCoM) initiative, and as subsequently applied by the Covenant of Mayors for the Mediterranean (CoM Med), which was established and is managed by Clima-Med.

The Manual emphasises the necessity of embracing a vision for a sustainable future, integrating national and local strategies, and engaging key partners in its preparation and implementation. It also underlines the weight and significance of data-driven decision-making, community involvement and coordination with relevant authorities.

CONTENT OF THE SEACAP PREPARATION MANUAL

The Manual provides users with step-by-step practical insights into the multiple stages of SEACAP preparation, starting with how to ensure political endorsement, identify key preparation actors and specify their roles (including the SEACAP Coordinator, Steering Committees, Technical team, and would-be stakeholders), conduct baseline emission inventories and assess climate risks and vulnerabilities, design energy efficiency, mitigation, and adaptation actions, and finally, plan and execute awareness-raising processes.

THE MANUAL CONSISTS OF EIGHT CHAPTERS:

DESCRIPTION OF BACKGROUND CONDITIONS AND FORMULATING THE SEACAP STRATEGY:

Chapter 1 presents basic, relatable information about the LA geographical context, population, economic sectors, infrastructure, and services. The SEACAP strategy reveals the LA vision of a sustainable climate-resilient future, its adherence to the NDC national climate commitment, and the application of associated requirements and policies. Furthermore, it confirms the engagement to prepare and implement the SEACAP through a consolidated administrative structure led by a dedicated team. It proposes a monitoring process and the first identification of funding sources for implementing the SEACAP projects.

BASELINE EMISSION INVENTORY (BEI):

Chapter 2 guides users in conducting a BEI based on a determined baseline year and assessing the LA's energy consumption data, current greenhouse gas emissions, and carbon footprint covering multiple sectors, such as buildings, transportation and waste management.

RISK AND VULNERABILITY ASSESSMENT:

Chapter 3 assesses the Climate Risks and Vulnerabilities faced by the LA. It concisely evaluates climate hazards, vulnerable population groups, and sectors most exposed to the impacts of C.C.

ASSESSING ACCESSIBILITY TO ENERGY:

Chapter 4 addresses the state of affairs regarding access to energy, sustainable energy (SE) needs, and associated challenges faced by communities and households, identifying the causes and potential solutions to overcome them.

MITIGATION & SUSTAINABLE ENERGY ACTIONS:

Chapter 5 recommends climate mitigation measures and actions to reduce emissions in several sectors, including applying energy efficiency and renewable energy in buildings, sustainable mobility and transportation solutions, and solid waste management improvements.

ADAPTATION ACTIONS:

Chapter 6 recommends climate adaptation measures and actions to enhance LAs' resilience to the impacts of CC in various affected areas, such as public health, urban development and management, water management, drought and desertification, nature-based solutions, and management of natural risks.

POTENTIAL SOURCES OF FUNDING:

Chapter 7 provides an overview of possible funding sources and summarises the recommendations of the Climate Finance Guidebook (CFG) prepared by Clima-Med to enhance finance at the local and national levels and by international financing institutions (IFIs) and establish SEACAP Support Mechanisms.

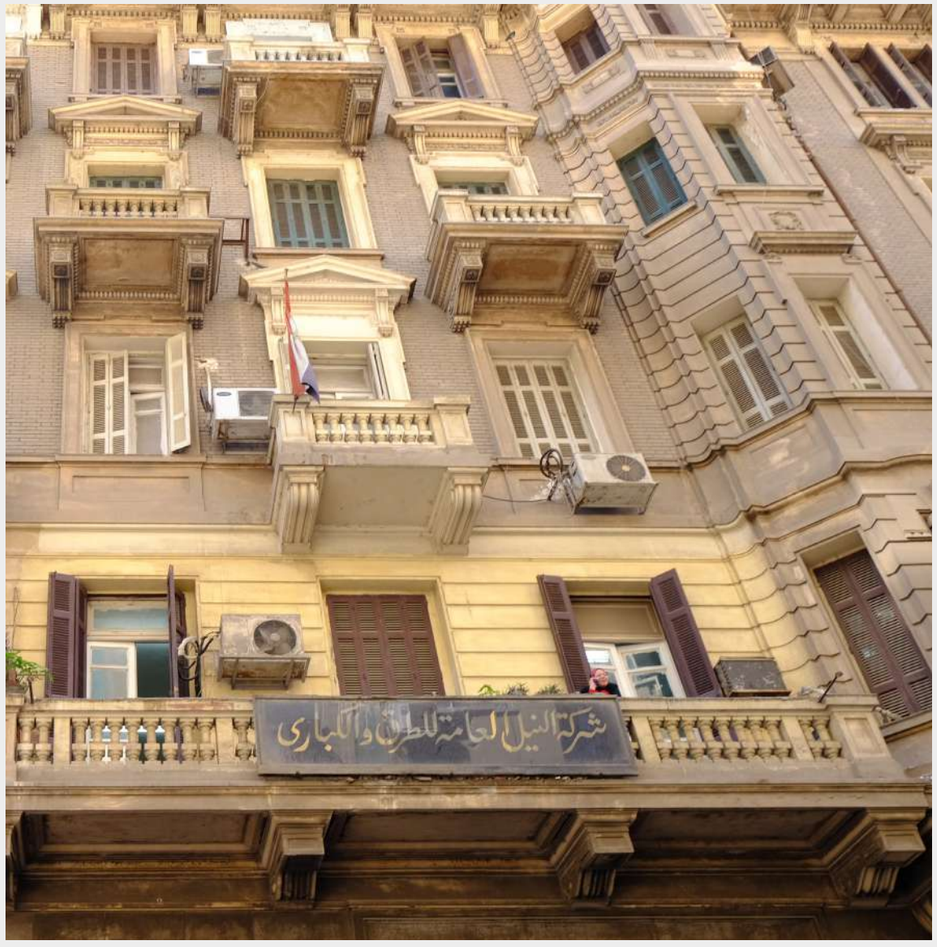
COMMUNICATION AND AWARENESS RAISING[1]:

Chapter 8 underlines the significance of effective communication and public engagement and proposes awareness-raising strategies and models to enhance responsiveness, engage stakeholders, and foster support for the SEACAP initiative and its projects.

*1 It is not mandatory to include Chapters 7 and 8 of this Manuel in the SEACAP's content required by the JRC, and in the context of joining the CoM Med. Nevertheless, based on Clima-Med's experience, they are considered important and their inclusion is highly recommended.

FORESEEN USERS OF THE SEACAP PREPARATION MANUAL

The Manual's targeted users include members of national and local authorities, agencies, research and academic centres, and other professionals and technicians who may be engaged in preparing and supporting the preparation and implementation of climate plans and actions, particularly SEACAPs at the local level.



To the User: As you prepare the SEACAP and use this Manual, remember that your efforts contribute to a collective commitment to combating CC and improving your community's well-being and are essential to achieving a more sustainable and resilient future.

To support beneficiaries in the preparation of the Sustainable Energy Access and Climate Action Plan (SEACAP) more easily, simplified tables have been included in the annexes at the end of document. These tables correspond with each relevant chapter and are intended to clarify the structure and support the preparation process.

LAYING THE GROUNDWORK FOR THE SEACAP PREPARATION[2]

CONFIRMING THE POLITICAL ENDORSEMENT OF THE SEACAP

The LA must ensure that the SEACAP preparation exercise and its content comply with the national strategies and policies in place and local laws and regulations and are integrated into the LA's projects and activities.

The responsible party, commonly the Municipal or Local Council or the government body legally in charge, should issue a decision approving the preparation of the SEACAP.

ENGAGING THE SEACAP PREPARATION PARTIES

In the initial steps, the mayor or the person in charge is invited to assign a staff member or external professional as the SEACAP Coordinator (SC), a SEACAP Steering Committee (SSC), and a SEACAP Technical Team (STT) to prepare the plan. Internal (from the LA personnel) and external specialists will be affiliated when necessary. The mayor will also ensure the allocation of sufficient resources to prepare for SEACAP.

ROLE OF THE SEACAP COORDINATOR

The SC should set up arrangements for the SEACAP's preparation and delivery, closely working with and coordinating the roles of the SSC, the STT, and other stakeholders. More specifically, they will :

- Prepare and ensure approval of SEACAP's preparation terms of reference and work plans,
- Select and task the SST's members,
- Facilitate and synchronise data collection, issuing of permits and preparation logistics,
- Obtain inputs from external actors,
- And will watch over the SEACAP's preparation, monitor deadlines, unblock unforeseen obstacles, and ensure the quality control of the final deliverable.

[2] For a simplified preparation of this section, see Annexe II: Laying the Groundwork for the SEACAP Preparation.

ROLE OF THE SEACAP STEERING COMMITTEE

The SSC typically includes political representatives of the LA and possibly from partner organisations with functions connected to the SEACAP's sectors, such as ministerial departments of water, electricity, environment, transportation, etc.

The SSC should endorse the SEACAP's preparation, steer work progress, and ultimately approve the plan. More specifically, the SSC will :

- Secure necessary resources to prepare the SEACAP,
- Support and facilitate the overall tasks of the SC and the STT,
- Ensure the SEACAP's compliance with the LA's operations,
- Approve and seek approvals from relevant authorities to integrate the plan's directives,
- Work with the SC and the STT to define the SEACAP Strategy, Emission reduction target, and actions,
- Help identify and allocate funding to implement the SEACAP's actions.
- Support the implementation of the SEACAP projects.
- Promote and set up a system to update the SEACAP.

ROLE OF THE SEACAP TECHNICAL TEAM

The STT should typically consist of representative(s) of the LA's heads of divisions and technical staff from various fields such as planning, energy, housing, agriculture, water, transportation, etc. If the LA does not have such expertise, external expert assistance will have to be arranged to join the STT or undertake its role.

The responsibility of the STT is to prepare the SEACAP under the control of the mayor, the SC and the SSC. At the start of the preparation of the plan, the STT ought to

- Ensure that the SEACAP and its actions are integrated into existing strategies, plans and processes,
- Convene with concerned government parties, civil society and the local community to incorporate their values, objectives, and socio-economic needs in the SEACAP and
- Address the LA's capacity-building needs to ensure the coherent adoption and implementation of SEACAP.

ASSOCIATING THE SEACAP STAKEHOLDERS

The STT may associate relevant stakeholders to support the preparation of the SEACAP, including representatives of government agencies, civil society organisations, the private sector, academia and research institutions. Stakeholders can

- Help raise awareness about CC issues in general and, in particular, the importance of SEACAP,
- Provide political backing to the adoption of the SEACAP by the LA and at various levels of government,
- Help monitor the SEACAP's preparation and implementation progress, and suggest improvements,
- And contribute to identifying and setting up funding and investment opportunities and bankable projects.

“ PREPARING THE SEACAP

MUNICIPALITY DESCRIPTION AND SEACAP VISION[3]

1.1 Defining the SEACAP GHG Emissions Reduction Target

The Nationally Determined Contributions (NDC) embodies each country's engagement to reduce emissions. It is the country's self-defined national climate pledge under the Paris Agreement. The NDC notes what the government will do to limit the rise in global temperatures to 1.5 °C above pre-industrial levels, adapt to climate change's impacts, and ensure sufficient finance to support its climate-linked actions. NDCs are submitted to the UNFCCC secretariat every five years. They reflect short—to medium-term targets and typically embrace national measures for mitigation and adaptation. To enhance the ambition over time, the Paris Agreement provides that successive NDCs will represent a progression compared to the previous NDC and reflect the highest possible ambition. Some of the NDC targets submitted in the Med region are listed below.

Country	Conditional target	Unconditional target	Date submitted	Target year
Egypt	33% reduction in electricity related emissions with 7% reduction in the transport sector	-	June 2022	2030
Jordan	31%	5%	October 2021	2030
Lebanon	31%	20%	Updated in 2020	2030
Morocco	45.5%	18.3%	June 2021	2030
Palestine	26.6 % (independence scenario) 17.5% (status quo scenario)	-	October 2021	2040
Tunisia	45%	28%	October 2021	2030

Accordingly, the SEACAP goal should abide by the respective country's NDC target, and mitigation actions prescribed in the SEACAP must contribute to lowering the carbon footprint to the level of NDC, as a minimum. Reduction targets are to be set against a Business As Usual (BAU) scenario, adopted at the national level and reflecting future patterns of activity assuming that there will be no significant changes in people's attitudes and priorities in technology, economics or policy applications so that normal circumstances can be expected to continue unchanged*4.

*3 For a simplified preparation of this section, see Annexe 1: Municipality Description and SEACAP Vision

*4 If the LA wishes to join the Covenant of Mayors (CoM), it must declare its commitment to achieving this goal according to the base year it has considered for the SEACAP BEI. The LA should also clearly state its targets concerning Access to Energy and Climate Adaptation measures.

Example of a commitment declaration to join the CoM Med and to prepare SEACAP

In line with implementing (the country) NDC and in the context of joining the Covenant of Mayors Mediterranean (CoM-Med), (the LA name) is committed to reducing its GHG emissions by (insert percentage) by the year (year*5), with the year (year) as the Baseline year.

As far as Climate Adaptation is concerned, the LA aims to take all the necessary measures to increase its resilience and reduce the adverse impacts on population and infrastructure, especially as related to (include specific climate hazards, e.g., water scarcity or coast erosion) in the (insert sectors, e.g., agriculture / coastal zone management). The target set concerns (insert areas of problems, e.g., reducing agricultural losses due to water scarcity) by (insert percentage).

The LA is committed to increasing access to sustainable energy by (insert percentage %). Reaching the targets set by the LA stipulates working closely with relevant actors, taking necessary measures to establish a good example for the community, and collaborating with the public. In addition, all steps and actions must be taken to achieve significant GHG reductions in the building, transportation, solid waste, and other sectors.

1.2 Overviewing the Municipality's Existing Conditions

In this opening section of the SEACAP, basic information regarding the LA should be provided, including an overall description of the geography, population and employment, economic sectors, essential services and infrastructure, current and foreseen challenges, needs, and priority areas of intervention. The following information should be succinctly provided:

Geographical features: The LA surface, location, borders, coordinates (north, east, west and south), altitude, type of landscape (e.g., mountainous, plain, green, desertic), and weather conditions: average temperature in summer and winter, precipitation, etc.

Population and Employment: Total population, including residents and refugees, number of households, division (male % and female %), the average number of family members, number of visitors and users, employment and unemployment percentages and different employment sectors (e.g., agricultural, industrial, private, public, freelance, etc.).

Economic sectors: Agriculture: Common crops and yields; Livestock: number of breeding farms and types of livestock; Industry: type of industries; Commerce, financial establishments, and banks; Tourism: type, historical areas, hospitality establishments, and visitors' figures, and potential sources of resources for the LA.

*5 Same as the Baseline year selected under Baseline Emission Inventory

Example of population and employment overview, Bethlehem municipality

In 2017, Bethlehem's population of 31,000 was 51% male and 49% female, with 5,211 families registered living in 6,709 housing units. The age groups are 34.1% under 15, 56% between 15 and 64, and 4.9% 65 or older (with the remaining 5% unknown).

The City of Bethlehem is in the centre of the Bethlehem Governorate and receives about 70,000 Palestinian visitors daily, largely from nearby localities. These visitors access the city either for trade, work, or services (government, education, public health, etc.). The municipality tends to 100,000 people daily. Moreover, Bethlehem hosts two million tourists annually, mostly daily visitors.

3% of Bethlehem's workforce is employed in the government, 25% in services and tourism, 23% in trade, 18% in industry, 3% in the Israeli labour market, and 1% in agriculture. The unemployment rate is around 27%.

Example of the economic sectors' overview, Al Ram municipality

In 1945, Al-Ram mainly consisted of arable land, with 2,732 dunams planted with irrigated orchards and grain. It consists of a low-value cultivated area reduced to about 223 dunams, mainly of olive trees in rain-fed orchards near residential buildings. Before Israel built the separation wall in 2007, Al Ram was considered an economically and commercially active city due to its location on the Ramallah-Jerusalem road. It was then particularly known for its meat trade and a destination for those looking for meat markets of all kinds.

Currently, only 1% of the residents in Al Ram rear and keep domestic animals. In general, after the construction of the wall, a decline and economic stagnation affected many commercial, industrial, and service enterprises.

According to municipal statistical records, there are approximately 830 registered commercial, industrial, and service establishments, including banks, trades such as building materials and metalworking, shops, and various services.

Finally, the 2,700-m2 old town of Al Ram is in very poor condition and mostly damaged. Restoring the historical centre and organising associated cultural and social activities are essential to revitalizing the city and its tourism, archaeological, and entertainment sectors.

Infrastructure and key services: General information should be succinctly provided regarding Drinking water, electricity, road networks, wastewater and rainwater networks, solid waste management, and major infrastructure provision actors, both public and private. Health Services: availability and coverage (number of hospitals and health centres), especially in areas vulnerable to climate hazards; Educational facilities: Number of schools, universities, academic centres, and private Institutions; and Primary community services: NGOs, associations, activities (cultural and artistic facilities, open and public spaces, etc.).

Example of key services and infrastructure overview, Bani Suhaila municipality

The city's electricity demand is 6 MW during winter peak times, requiring 12 to 18 hours of supply. Like other Palestinian towns, Bani Suheila suffers from a decline in all essential services provided to citizens due to the blockade imposed on the Gaza Strip. Electricity is supplied to the city for 8 hours per day, divided into two shifts, covering 95% of the households. Regarding access to drinking water, the city has three wells operated by the municipality, linked to a 40 km potable water network, which generates a 20% loss and connects to the housing units. The total quantity of potable water consumed per month is 180,000 m^3. The city also has five private wells for irrigation.

The municipality collects solid waste and transports it to the main landfill, where it is dumped. The city requires more garbage vehicles, contributing to a severe accumulation of various types of waste (solid, agricultural, industrial, and building materials). To manage its wastewater, the city has a 12 km network covering only 30% of the populated area and a 4 km rainwater collection network. There are 2,000 cesspits in the town used by households, which need to be covered by the leading network.

Bani Suheila has a road network of 410 km, of which 30% is paved, 15% is in good condition, and 20% is in medium condition, paved and 40% of the streets equipped with lighting poles.

1.3 The SEACAP Strategy

1.3.1 Establishing a Long-Term Vision

When committing to preparing a SEACAP, the LA should establish a long-term vision of what the plan should achieve. In short, the SEACAP Vision should refer to the LA identity and uniqueness, its communities, and its climate challenges. The vision should then define the main goals of the SEACAP-related climate action, including its foreseen strategic decisions and intervention sectors.

Overall, the SEACAP Vision envisions the future of LA climate engagement and sustainableenergy decades after its implementation.
The Vision may also refer to critical milestones, significant outcomes, and sought-after benefits.

As noted earlier, achieving the Vision will require the adherence and engagement of a wide range of partners and stakeholders, as well as building strong ties with citizens, broad community consultation, and public involvement on the Vision's issues affecting them, as dealt with in the SEACAP. This requires designing and implementing a clear SEACAP Communication Strategy, with awareness-raising campaigning, as Chapter 9 of this Manual explains.

**Example of a "SEACAP's Vision",
Batloun municipality, Lebanon**

The SEACAP's Vision stems from Batloun's unique history, as it intends to capitalise on its identity as a traditional village with sustainable tourism. The challenges facing the municipality's long-term sustainability foresight are growth and population increase issues. The municipality's primary goal is to reduce air pollution while implementing mitigation actions and measures to reduce CO2 emissions and cope with the impacts of CC on the area.

The municipality's strategic decisions aim to use future development of the region to create local jobs for residents by expanding the agricultural, commercial, and industrial sectors, developing sustainable tourism, investing in producing renewable energy and energy efficiency equipment and materials, installing a modern water harvesting system, greening the village, initiating sustainable schemes for solid waste management and livestock development.

1.3.2 Ensuring Complementarity and Coordination with Local & National Climate Plans

In addition to adhering to the NDC target, actions proposed in the SEACAP must comply with and be consistent with climate-relevant framework documents in their varying objectives.

Thus, this section should refer to these documents whenever pertinent to the SEACAP. These include national commitments, such as ratification of the Kyoto Protocol and national NDCs, climate action visions, NAPs, sectors' strategies and policies, particularly where connected to alleviating climate impacts, e.g., urban management, energy, transportation, housing, etc.[6]

**Example of reference to "Complementarity & Coordination with Local & National Authorities & Plans" in the SEACAP's Strategy -
Madaba, Jordan**

The SEACAP will play an essential role in implementing Jordan's Nationally Determined Contribution (NDC) submitted to the UNFCCC, used to reduce GHG emissions by 14% by 2030, noting that Jordan can achieve an unconditional 1.5% reduction target. Conditionally, it can achieve an additional 12.5%

The SEACAP has been developed in line with the Jordanian National Climate Change Policy, designed to adapt the country to CC's impacts in the sectors of water, coastal areas, agriculture/food security, health, tourism, biodiversity, and socioeconomic development/poverty.

Moreover, it is consistent with the country's National Strategy and Action Plan to Combat Desertification (2015-2020), which is aligned with the United Nations Convention to Combat Desertification (UNCCD) 10-year strategy, noting that Jordan also mainstreamed CC into the National Biodiversity Strategy and Action Plan (2015-2020) and with the global Convention on Biological Diversity (CBD) 10-year strategy.

Also, the SEACAP is in line with Jordan's National Strategy and Action Plan for Sustainable Consumption and Production (2016-2025), which mainstreams sustainable consumption and production into agriculture/food production, transport, and waste management.

6 Note that the Clima-Med Project has presented these documents, at best, in the country's "Climate Action Strategy" (CAS) report and the "Annexe of the Climate Finance Guidebook. "

1.3.3 Consolidating the LA Administrative Structures and Involving Stakeholders

As discussed earlier in Part II, the LA administrative structure must be strengthened to successfully prepare and implement the SEACAP. The preparation parties, including the SEACAP coordinator, steering committee members, technical team, and associated stakeholders, should be assigned, and their tasks should be indicated in the SEACAP

Example of reference to "Consolidating the LA Administrative Structures & Involving Local Stakeholders" in the SEACAP's Strategy
- Al Zarqa, Jordan

The SEACAP preparation will be conducted through the existing structures already established to prepare similar action plans, followed by the assignment of external consultants or specialists.

The municipality has an active technical services department, an environmental committee, and the necessary channels to communicate with the local community and future stakeholders. The Mayor will assign a staff member with an external professional as SEACAP Coordinators (SCs); a SEACAP Steering Committee (SSC) will be formed from members of the Local Council; and a SEACAP Technical Team (STT) will be tasked with comprehensive Terms of Reference to prepare the plan. The Local Council will ensure the allocation of resources to prepare for SEACAP, and the identification of funding schemes to implement the actions will be conducted once mitigation and adaptation actions are identified selected.

1.3.4 Financing the SEACAP Implementation

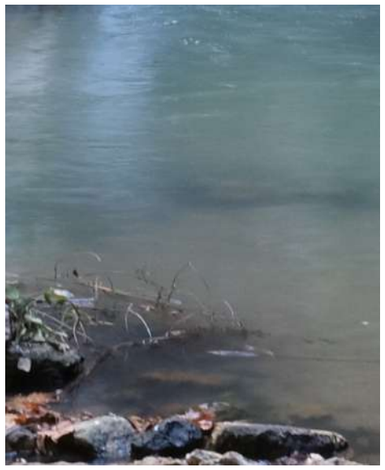
This section should briefly identify the anticipated funding sources for implementing each SEACAP project per sector, such as the municipal budget, national government funding, local taxes, fees for services offered to citizens, foreseen investments, grants, and loans.

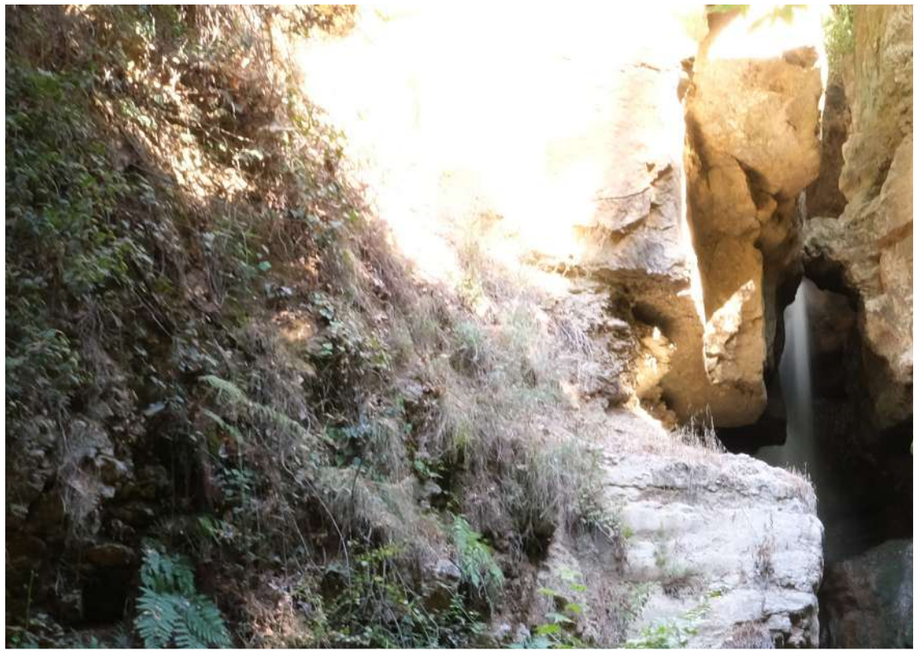
Example of reference to "Financing the SEACAP Implementation"

Municipal funding largely comes from the national government, municipal taxes (property, school, and licensing), and fees for services offered to citizens (e.g., solid waste collection).

The municipal budget share allows small-scale funding, and the implementation of the SEACAP projects will largely depend on attracting grants, private sector investments, and contracting loans, among other feasible financial architecture schemes, as it will be specified for each of the prescribed SEACAP actions, according to comprehensive feasibility studies.

The first estimated budget for implementing the SEACAP amounts to ..... to be covered by 20% from the national government, 5% from NGOs and crowdfunding, and 20% of the city's revenues.





2

BASELINE EMISSION INVENTORY (BEI)[7]

Chapter 2[7] presents the methodology used to conduct the SEACAP's Baseline Emission Inventory (BEI), a starting point for measuring and evaluating future emissions reductions achieved through the SEACAP's prescribed actions or projects. The BEI is vital for developing strategies to combat CC, reduce air pollution, improve air quality, identify priority climate actions, monitor their implementation, and assess their expected emission reduction results.

To calculate LA's emissions, emission sources are categorised into key sectors. Energy consumption data covering both electricity and fuel use is collected for a chosen base year. This data is then converted into its equivalent emissions using standard conversion factors.

Energy consumption is measured in different units depending on the source. Electricity is recorded in kilowatt-hours (kWh) and converted to CO_2 equivalent using the appropriate electricity conversion factor. For liquid fuels such as diesel, consumption is measured in litres, which are first converted to their equivalent kWh before applying the relevant CO_2 conversion factor. Similarly, gas consumption is measured by weight and converted accordingly. All these calculations follow the guidelines outlined in the SEACAP manual.

The CO2 Equivalent (CO2—Eq) unit quantifies GHG emissions and is the unit of measurement used to standardise the climate effects of various GHGs.

2.1 The BEI development process

The BEI development process involves the following key steps:

1. Defining the scope by delimiting the geographical boundaries of the area and the sector for which the inventory is being developed.

2. Selecting the baseline year in which reliable data is available.

3. Collecting data on GHG emissions within the defined Scope from various sources, such as energy consumption figures, industrial activity reports, agricultural statistics, transportation records, and waste management data, and reported per sector (e.g.,energy, agriculture, waste).
Coherent BEI reporting requires comprehensive and transparent documentation of the used data, sources, methodologies, and assumptions.

4. Calculating the GHG emissions using the collected data by applying specific emission factors or equations that convert the data into GHG emissions.

5. Quality assurance and control of data accuracy, reliability and calculation methods applied. This involves data validation, error checking, and consistency assessments to identify and resolve any discrepancies or anomalies.

7 For a simplified preparation of this section, see Annexe 2: Baseline Emission Inventory (BEI)

2.1.1 Defining the BEI Geographical Area

The BEI application area is within the administrative boundary of the LA, which is covered by the SEACAP and where the BEI sectorial activities are conducted.

The plurality of divisions, e.g. centre, department, governorate, administrative sector, region, etc., should be considered.

2.1.2 Selecting the Baseline Year

A baseline year is when an organisation or nation's past GHG emissions are measured. The purpose is to provide a benchmark against which to judge the success of future emission reduction projects.

The baseline year should be chosen based on the availability of reliable data. This year will be a reference for tracking progress in reducing emissions up to the target year in the country's Nationally Determined Contribution (NDC). It is advised to avoid using 2020 or 2021 as baseline years, considering that the COVID-19 crisis and its lockdowns impacted LA operations.

2.1.3 Reporting the BEI Sectors

The GHG emissions should be reported from several sectors, including Buildings and facilities (municipal, residential, tertiary, etc.); **Public street lighting; Transport** (solid waste management fleet, municipal fleet, private and public transport); **Energy production,** including from renewable sources; **Non-energy-related activities,** such as solid waste, wastewater treatment, etc.; **And eventually, AFOLU** (Agriculture, Forestry, and other land uses) sectors, comprising land uses and forestry, livestock, and agriculture).

2.1.4 Calculating GHG by Energy Sources

Several methods exist to calculate greenhouse gas (GHG) emissions. The most appropriate should be selected based on data availability and scope. The three primary methods are:

1. The Intergovernmental Panel on Climate Change (IPCC) method calculates GHG emissions, focusing either on CO2 emissions alone or including other gases such as methane (CH4) and nitrous oxide (N2O). It follows guidelines to estimate emissions from various sectors, such as energy, waste, and agriculture.

2. The Life Cycle Assessment (LCA) comprehensive method measures GHG emissions throughout a product or service's entire life cycle, from raw material extraction and production to usage and disposal, allowing a more holistic environmental impact view.

3. The Per capita-based Method calculates emissions by dividing the total national or regional emissions by the population involved, resulting in a per capita estimate of GHGs. It offers a simplified approach when detailed data are not available.

The IPCC and LCA approach estimates emissions based on energy consumption or fuel use using an emission factor (EF) from various activities and processes and a unique coefficient. By multiplying the fuel consumed by the emission factor, we obtain the corresponding emissions in terms of CO2 or CO2 equivalent (CO2eq)[8]. The approach to EFs can vary depending on the context in which they are applied.

In contrast, the Per Capita-Based method simplifies the calculation process using national or regional averages of per capita emissions. This makes it easier to estimate local-level GHG emissions without extensive data collection.

Below are three EF types which can be used to calculate the Baseline Emission Inventory (BEI) in the Sustainable Energy and Climate Action Plan (SEACAP).

Emission Factors (EFs)			
IPCC (Intergovernmental Panel on Climate Change)		**LCA (Life Cycle Assessment)**	**National/Sub-national Per capital**
Emission factor for **CO2** emissions **(in tCO2/MWh)**	**GHG emissions including CO2, CH4 and N2O (in tCO2-eq/MWh).**	GHG emission factor including **CO2, N2O and CH4 (in tCO2- eq/MWh), including upstream (supply chain) emissions**	**At national or sub-national level,** emission factors are used to calculate GHG emissions per sector /activity
Emission Factors (EFs): IPCC defines emission factors as coefficients that quantify the emissions or removals of a greenhouse gas (GHG) per unit activity. These factors are crucial for estimating emissions based on specific activities, such as fuel combustion or industrial processes, and are typically expressed in terms of mass of pollutant per unit of activity (e.g., kg CO_2 per litre of fuel). In the activity-based approach has two methods, (i) an emission factor is provided for CO2 emissions **(in t CO2/ MWh)** only, and (ii) another for GHG emissions including CO2, CH4 and N2O **(int CO2-eq/MWh).**		**Emission Factors (EFs):** In LCA, emission factors are used to quantify the environmental impacts associated with each stage of a product's life cycle, from raw material extraction to disposal. These factors include data on the emissions of various pollutants (including GHGs) per unit of product or service, enabling the assessment of the environmental footprint of products and processes. In the LC approach (iii) an emission factor is provided accounting for GHG emissions including CO2,N2O and CH4 (in tCO2-eq/MWh), including upstream (supply chain) emissions.	**Emission Factors (EFs):** At the national or sub-national level, emission factors are utilized to calculate GHG emissions for specific sectors or activities, such as transportation, energy, or agriculture. These factors are often tailored to reflect local conditions, technologies, and practices, providing a more accurate representation of emissions for a particular region or jurisdiction.

Energy use data vary by sector. For instance, in the transportation sector, fuel consumption is measured in litres, electricity use is measured in kilowatt-hours, and waste is quantified by weight (tons). All this data must be converted into energy equivalents (megawatt-hours), allowing for calculating carbon dioxide or equivalent emissions.

8 IPCC Guidelines for National Greenhouse Gas Inventories https://www.ipccnggip.iges.or.jp/public/2006gl/index.html

9 https://data.jrc.ec.europa.eu/dataset/72fac2b2-aa63-4dc1-ade3-4e56b37e4b7c

Emission factors for Fuel

Table 1 below have the conversion factor for three methodologies to calculate the emission factors, one of these methodologies can be used to prepare the baseline emission within the boundary of municipality, which can be multiplied with the energy produced be the related fuel to obtain the equivalent GHG emissions.

Table 1: Emission factors for local use of non-renewable energy sources (NRES)[9]

Energy source		Activity-based (IPCC) approach		Life-cycle (LC) approach
SECAP category	**IPCC category**	**CO2 (t CO2/MWh)**	**GHG (t CO2-eq/MWh)**	**GHG (t CO2-eq/MWh)**
Natural gas	Natural gas	0.202	0.202	0.261
Liquid gas	Liquefied Petroleum Gases	0.227	0.227	0.311
	Natural Gas Liquids	0.231	0.232	0.339
Heating Oil	Gas/diesel oil	0.267	0.268	0.340
Diesel	Gas/diesel oil	0.267	0.268	0.349
Gasoline	Motor gasoline	0.249	0.250	0.333
Lignite	Lignite	0.364	0.365	0.373
Coal	Anthracite	0.354	0.355	0.404
	Other Bituminous Coal	0.341	0.342	0.392
	Sub-Bituminous Coal	0.346	0.348	0.416
Other non-renewable fuels	Peat	0.382	0.383	0.388
	Municipal Wastes (non-biomass fraction)	0.330	0.337	0.346

Example:

Data for liquid fuels like diesel or gasoline may be mass or volume. It should be converted to mass or use NCV in volume terms if given in volume. This conversion typically uses the fuel's density, representing mass per volume unit (e.g., kg/m^3).

To illustrate this process, the example below demonstrates how the collected data is converted into emission values.

Diesel fuel of 100 000 litres (100 m3)

Step 1 - Convert volume into mass

Diesel = 100,000 Liters (100 m^3)

The data is provided in volume, so we need to convert it to mass using the formula:

Mass of Diesel = Volume * Density

For this example: 100,000 Liters × Diesel Density (0.84 kg/L) = 84,000 kg

This typical density value can be found in Table 2

The mass in kg needs to be converted to tone (t).

Each 1000 kg equal to 1 tone

So, 84 000 kg is equal to 84 tone (t).

Step 2 – Calculate energy

Energy = Mass * NCV = 84 [t] * 43 [TJ/Gg] = 84 t * 43 TJ/ (1000 [t]) = 3.612 [TJ]

Step 3 – Convert TJ to MWh

1 TJ = 1012 J = 277.778 MWh, so

3.612 [TJ] = 277.778 [MWh/TJ] * 3.612 [TJ] = 1003 MWh

Step 4 – Convert MWh to CO2 or CO2 eq.

Based on the information provided in Table 1, the following emission factors apply for diesel oil:

To convert energy results from MWh to emissions, use the appropriate conversion factors:

- If the **IPCC approach** is selected, use:
  - 0.267 t CO2/MWh for CO2 emissions
  - 0.268 t CO2-eq/MWh for GHG emissions
- If the **Lifecycle (LC) approach** is selected, use:

0.349 t CO2-eq/MWh for GHG emissions.

Example Calculation:

For a given energy consumption of 1003 MWh, the emissions can be calculated using the relevant conversion factors.

For the **IPCC approach** (CO2 emissions from diesel oil):

- Emission = Energy (MWh) × Emission factor (t CO2/MWh)
- Emission = 1003 MWh × 0.267 t CO2/MWh = 267.8 t CO2

Table 2: Fuel Density[10]

Fuel Type	Range	Typical Value
Motor Gasoline / Petrol	Range (0.73-0.76) kg/L	Typical value: 0.74 kg/L
Diesel	Range (0.82-0.95) kg/L	Typical value: 0.84 kg/L
Kerosene	Range (0.79-0.82) kg/L	Typical value: 0.80 kg/L
LPG	Range (0.53-0.55) kg/L	Typical value: 0.54 kg/L

10 https://claverton-energy.com/cms4/wp-content/uploads/2012/08/the_energy_and_fuel_data_sheet.pdf

To Simplify the above calculation process, the table below is used for direct conversion.

Table 3: Fuel conversion factor to energy in MWh

fuel	Energy Conversion factor	CO2 Emissions Factor tCO2-eq/ MWh
Diesel	0.01 MWh/L	0.268
Gasoline	0.0092 MWh/L	0.250
Kerosene	0.0097 MWh/L	0.259
LPG	0.0137 MWh/g	0.227
Natural gas	0.0133 MWh/Kg	0.202

For example:
If the LA consumed **1000 litres of diesel fuel** for space heating,
The consumed energy in MWh can be calculated according to the below formula:
Consumed energy in MWh = Consumed fuel in Litre or Kg multiplied by related Energy Conversion Factor (from the table above, second column) =

1000 litres diesel x 0.01 = 10 MWh

To convert MWh to emission in tCO2-eq
The consumed energy in MWh (as calculated above) multiplied by the related CO2 Emissions Factor from the above table (column four) =.

10 MWh x 0.268 = 2.68 tCO2-eq

This means that the fuel consumed by 1000 litres of diesel is equivalent to 10 MWh of energy and produces GHG emissions of 2.68 tCO2-eq.

For Electricity, note that the emission factor varies per country

To convert the electricity consumed into MWh, multiply it by the National Emission Factor for
electricity (NEFE) to tCO2-eq.

Below are the NEFEs, as provided by JRC, classified by country and based on 2015 as the baseline year. For better accuracy, you must consult the country's National Utility to obtain the NEFE for the selected baseline year.

For the **IPCC approach** (CO2 emissions from diesel oil):
· Emission = Energy (MWh) × Emission factor (t CO2/MWh)
· Emission = 1003 MWh × 0.267 t CO2/MWh = 267.8 t CO2

Table 4: National Emission Factors for Electricity for 2015.[11]

Examples of National Emissions factors for electricity consumption - IPCC Approach: tCO2-eq/MWh per country	year 2015
Algeria	0.734
Egypt	0.559
Jordan	0.695
Lebanon	0.781
Morocco	0.725
Palestine	0.720

For example, if the baseline year selected is 2015 in Jordan, the EF to convert 1MWh to tCO2-eq is 0.695. To realise the conversion, the electricity consumed in 1MWh by 0.695 equals 0.695 tCO2-eq.

11 A full-time series between 1990 – 2020 with electricity EFs for the Clima-Med countries is published by JRC under this link https://data.jrc.ec.europa.eu/collection/id-00172

2.2 Energy Consumption and Generated Emissions in the Building Sector

The building sector typically includes three categories: municipal buildings, equipment and facilities; residential buildings; and tertiary structures.

2.2.1 Assessing Emissions from Municipal Buildings, Equipment, and Facilities

This category includes beside buildings, consumption of public street lighting, and facilities such as athletic & sports facilities, and municipal waste-water treatment & desalination plants, freshwater/irrigation pumping stations. A dedicated section to the calculation of emissions from public street lighting is included in (2.2.5) of this chapter.

Calculating the GHG emissions generated by municipal buildings, equipment and facilities based on a baseline year consumption:

1. Identify, map, and determine the buildings and facilities and their function;

2. Collect information to determine the energy the building consumes per fuel type, such as electricity, natural gas, propane, or oil.

3. To calculate emissions, multiply the energy consumed by each fuel type by the corresponding EF or the coefficients that convert energy consumption into GHG emissions (expressed in units of GHG mass per unit of energy).

4. Report the findings and analyse the results before identifying areas for improvement and proposing solutions to reduce emissions.

Table 5: Example of emissions calculation in buildings

The energy consumed and emission produced in Municipal buildings, Equipment and Facilities			
Fuel Type	**Fuel consumed**	**Fuel Consumptions in MWh**	**Annual GHG Emissions in tCO2-eq**
Diesel (litres)	**1,000 litres**	To convert fuel consumed in litre to MWh, use the following formula: 1,000 litre times 0.01 (see Table 4) = 10MWh	To convert energy consumed in MWh to Emissions in tCO2-eq, use the following formula: 10MWh times 0.268= 2.68tCO2-eq
LPG (Kg)	**1,000Kg**	To convert fuel consumed in Kg to MWh use the following formula: 1,000 Kg times 0.0137 (see Table 4) = 13.7MWh	To convert energy consumed in MWh to Emissions in tCO2-eq use the following formula: 13.7MWh times 0.227= 3.11tCO2- eq
Kerosene (litres)	**1,000 Litres**	To convert fuel consumed in litre to MWh use the following formula: 1,000 litre times 0.0097 (see Table 4) = 9.7MWh	To convert energy consumed in MWh to Emissions in tCO2-eq use the following formula: 9.7MWh times 0.259= 2.51tCO2- eq
Electricity in KWh	**1,000 KWh**	To convert the consumed electricity in KWh to MWh use the following formula: 1,000 KWh divided by 1,000 = 1MWh	To convert electricity consumed in MWh to Emissions in tCO2-eq use the following formula: 1MWh times 0.695 (for Jordan and with base year 20156) = 0.695 tCO2-eq
	Total energy consumed 34.4MWh		**Total emissions produced 8.995tCO2-eq**

2.2.2 Assessing Emissions from Residential Buildings

Calculating the emissions of the residential sector is similar to that of municipal buildings and facilities. The residential building sector represents a significant portion of energy consumption, so it is crucial to calculate emissions, develop effective energy efficiency and GHG reduction initiatives, and promote sustainable residential building practices.

Conducting on-site Energy Audits:

Energy audits involve physically visiting residential buildings to assess energy consumption, usage patterns, and areas for improvement. They also enable the calculation of emissions based on building characteristics. However, this method is expensive, time-consuming, and requires significant human resources.

Utilising Energy Bills:

To estimate energy consumption for small local authorities (with fewer than 2,000 residents), energy bills of residential buildings can be requested and obtained. By examining this data, we can identify patterns in energy usage and calculate emissions accordingly. This method is not suggested for large agglomerations.

Surveys of Households:

Selected surveys to gather information on energy consumption patterns and habits provide valuable data on occupant behaviours, appliance usage, and energy-saving practices. LA can estimate energy consumption and derive emission calculations by analysing their results.

Data Collection from Utility Companies:

Accurate and up-to-date data on residential energy consumption to calculate emissions can be collected from utility companies that supply electricity and natural gas to residential buildings. This is the most cost-effective approach to apply if utilities accept sharing aggregated data.

National Statistical Administration and Studies:

Using per capita data on energy consumption patterns published by the National Statistical Administration or in national studies can provide comprehensive information on energy consumption in residential buildings. This allows for the estimation of emissions when no other method is achievable.

Table 6: Tubular format for the calculation of Residential Buildings' emissions

Energy consumed and emissions produced by residential buildings			
Fuel Type	**Fuel consumed**	**Fuel Consumptions in MWh**	**Annual GHG Emissions in tCO2-eq**
Diesel (litres)	**Litres**	To convert fuel consumed in litre to MWh use the following formula: ….litre times 0.01 (see Table 4) = ….MWh	To convert energy consumed in MWh to Emissions in tCO2-eq use the following formula: ….MWh times 0.268= ….tCO2-eq
LPG[12] (Kg)	**kg**	To convert fuel consumed in Kg to MWh use the following formula: ….Kg times 0.0137 (see Table 4) = ….MWh	To convert energy consumed in MWh to Emissions in tCO2-eq use the following formula: ….MWh times 0.227= ….tCO2-eq
Kerosene (litres)	**Litres**	To convert fuel consumed in litre to MWh use the following formula:….litre times 0.0097 (see Table 4) =….MWh	To convert energy consumed in MWh to Emissions in tCO2-eq use the following formula: ….MWh times 0.259= ….tCO2-eq
Electricity in KWh	**KWh**	To convert the consumed electricity in KWh to MWh use the following formula: ….KWh divided by 1,000=…. MWh	To convert electricity consumed in MWh to Emissions in tCO2-eq use the following formula: ….MWh times NEFE = ….tCO2-eq
	Total energy consumed ….MWh		**Total emissions ….tCO2-eq**

2.2.3 Assessing Energy Consumption in the Tertiary Buildings Sector

The methodology applied to assess emissions in the tertiary sector is identical to that of residential buildings.

2.2.4 Assessing Emissions in the Industrial Sector

The methodology applied to assess emissions in the industrial sector resembles the ones used for buildings, nothing that the decision to consider it in the SEACAP is left to the LA.

2.2.5 Assessing Energy Consumption in Municipal Public Lighting Sector

The methodology applied to assess emissions generated by public street lighting :

1. Gather Data on the number and type of streetlights, their wattage, daily operating hours, and the energy source (e.g., grid electricity) from utility companies or municipal services.

2. Calculate Energy Consumption: Multiply the wattage of each streetlight by the number of operating hours per day to obtain the daily consumption. Then, multiply this by the number of days per year to get the annual consumption per streetlight and, finally, the total.

3. Calculate Emissions: Multiply the annual energy consumption by the EF associated with the energy source (electricity) to get the total emissions from street lighting.

The table below presents an example of identifying the streetlights' capacity per lamp type.

Table 7: Example of power consumption per type of lamp

LAMP TYPE	HIGH PRESSURE SODIUM HPS				METAL HALIDE HIT			LED			
WATT	70	150	250	400	150	250	400	70	100	150	250
BALLAST OR DRIVER WATT	25	48	58	84	48	58	84	5	5	5	5
WATT PER TYPE OF LAMP	95	198	308	484	198	308	484	75	105	155	255

Table 8: Simplified table for the estimation of street lighting consumption.

Public Lighting Annual Electricity consumption (MWh)				
Type of street lamps	**Quantities**	**Watt per type of lamp**	**Total watt**	**Annual consumed energy in MWh**
High Pressure Sodium lamps HPS, Metal Halide Lamps HID Light Emitting Diode LED Other types of lamps	x	y	Z =X * Y	U1 = Z * ANNUAL OPERATION HOURS/ 1000
	x	y	Z =X * Y	U1 = Z * ANNUAL OPERATION HOURS/ 1000
	x	y	Z =X * Y	U1 = Z * ANNUAL OPERATION HOURS/ 1000
Total				**U= summation of U1...**

Energy consumed and emission produced in Public Lighting		
Site Category	Annual consumptions in MWh	Annual GHG Emissions in tCO2-eq
Public Lighting	U	=U * emission factor for Electricity

12 LPG : Liquified Petroleum Gaz

2.2.6 Compiling Energy Consumption and Emissions in Buildings, Equipment and Facilities

Consumption results obtained from the building and facilities sector (including industries, if applicable) are summarised in the tables below and used under the CoM-Med reporting platform.

Table 9 Final Energy consumption in Building sector Equipment / Facilities sector

SECTOR		FINAL ENERGY CONSUMPTION [MWh]																TOTAL
				FOSSIL FUELS									RENEWABLE ENERGIES					
		Electricity	District heating and cooling	Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geo thermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES																		
	Municipal buildings, equipment/ facilities																	
	Public lighting																	
	Other																	
TERTIARY (NON-MUNICIPAL) BUILDINGS, EQUIPMENT/ FACILITIES																		
	Institutional buildings																	
	Other																	
RESIDENTIAL BUILDINGS																		
Industry	Non-ETS																	
	ETS (not recommended)																	
Buildings, equipment/ facilities and industries not allocated																		
Subtotal																		

Table 10: Fuel Emission Factors Database – Source: CoM guidebooks for SEACAP development

Fuel Emission Factors Database																		
Renewable energies																		
CoM Template Energy carriers		Plant oil		Biofuel (1)		Biofuel (2)		Other biomass (1)	Other biomass (2)	Other biomass (3)		Other biomass (4)	Other biomass (5)	Solar thermal	Geothermal
IPCC Energy carriers		Other Liquid Biofuels		Bio gasoline		Biodiesels		Biogas	Municipal Wastes (biomass fraction)	Wood		Wood Waste	Other Primary solid biomass		
Sustainability criteria [a]		(s)	(ns)	(s)	(ns)	(s)	(ns)	-	-	(s)	(ns)	-	-	-	-
ipcc	t CO2/ MWh	0.000	0.287	0.000	0.255	0.000	0.255	0.197	0.000	0.000	0.403	0.403	0.360	-	-
	t CO2 eq./ MWh[b]	0.001	0.302	0.001	0.256	0.001	0.256	0.197	0.007	0.007	0.410	0.410	0.367	-	-

s) if sustainability criteria during production are fulfilled

ns) If sustainability criteria during production are not fulfilled

a. IPCC emission factors should be reported as zero if the biofuels/biomass meet sustainability criteria; fossil fuel emission factors are to be used if biofuels are unsustainable. (s) sustainable, (ns) not sustainable

b. Taking into consideration also the CH4 and the N2O emissions from combustion in stationary sources

The calculated data above can be presented in the table below.

Table 11: Summary table of CO2 emissions in the Building/ Equipment / Facilities sector

SECTOR		CO2 EMISSIONS [T] / CO2 EQ. EMISSIONS [T]																TOTAL
		Electricity	District heating and cooling	FOSSIL FUELS								RENEWABLE ENERGIES						
				Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geo thermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES																		
MUNICIPAL BUILDINGS, EQUIPMENT/FACILITIES																		
MUNICIPAL BUILDINGS, EQUIPMENT/ FACILITIES																		
PUBLIC LIGHTING																		
OTHER																		
TERTIARY (NON-MUNICIPAL) BUILDINGS, EQUIPMENT/ FACILITIES																		
INSTITUTIONAL BUILDINGS																		
OTHER																		
RESIDENTIAL BUILDINGS																		
INDUSTRY	NON-ETS																	
	ETS (NOT RECOMMENDED)																	
BUILDINGS, EQUIPMENT/ FACILITIES AND INDUSTRIES NOT ALLOCATED																		
SUBTOTAL																		

2.3 Transportation Sector

2.3.1 Estimating Fuel Consumption of the Transport Sector

The Transportation Sector in LA typically consists of Municipal Fleets (including those for transporting solid waste), Public Transportation, and Private Transportation. Acquiring data on fuel consumption in this sector can be challenging, especially for the private sector, but alternative approaches can be explored to obtain accurate information.

The first method is to gather fuel consumption data from the fuel distribution companies or the responsible national authorities that manage and monitor fuel distribution and sales.

The additional method is to gather information on the total number of vehicles in the LA and their average daily travel distance from different sources, such as vehicle registration records, surveys, and traffic monitoring systems. Combining this data with the average fuel consumption per vehicle can provide a relatively accurate estimate of the total fuel consumed by private transportation.

The following tables outline the essential information required to calculate fuel consumption. It is necessary to acknowledge that these tables serve as a guide, and the municipality can modify and disseminate the data within it if final information becomes available.

2.3.2 Estimating the GHG Emissions of the Solid Waste Management (SWM) Fleet

Using this table and subsequent analysis, the LA can better monitor the municipal fleet's fuel consumption and derive recommendations for reducing transportation costs, including applying alternative collection methods, proposing new routes or lines, maintaining equipment more efficiently, and implementing cost-effective measures.

After compiling the annual fuel consumption data for the municipality's solid waste management fleet, including different fuel types such as Diesel and Gasoline, it is imperative to verify these figures by cross-referencing them with the official records maintained by the municipal accounting department or the waste management department to ensure accuracy. In the event of disparities, a comprehensive analysis must be undertaken to identify the root causes behind variations and inconsistencies. These are attributed to various factors, including recording errors and inaccuracy of daily travel distances.

Moreover, the deterioration of the municipality's transportation fleet and inadequate vehicle maintenance, which result in increased fuel consumption, is often a cause of data disparity.

Once the verified data on fuel consumption is available, it can be entered into the table below to calculate the emissions generated by the fuel used to transport Solid Waste.

Table 12: Template for SWM fleet's energy consumption calculation

LOCAL AUTHORITY'S SOLID WASTE MANAGEMENT FLEET TYPE OF FLEET	QUANTI-FYING FLEET DISTRIBUTION BY TYPE = X	MEASURING DAILY TRAVEL DISTANCE FOR COLLECTION AND LANDFILL DISPOSAL IN KM = Y	TOTAL ANNUAL WORKING DAYS = Z	TOTAL ANNUAL TRAVELLING DISTANCE FOR COLLECTION AND LANDFILL DISPOSAL IN KM = A	AVERAGE CONSUMPTION OF FUEL PER KM IN LITRE FOR EACH TYPEOF FLEET = B	ANNUAL FUEL CONSUMPTION PER TYPE OF FLEET = D	TYPE OF FUEL DIESEL OR GASOLINE OROTHER SHOULD BE MENTIONED BELOW
REAR-LOADER TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
FRONT-LOADER TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
SIDE-LOADER TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
ROLL-OFF TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
GRAPPLE TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
COMPACTOR TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
HOOK-LIFT TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
TRANSFER TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
VACUUM TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
SCAVENGER TRUCKS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
OTHERS	X	Y	Z	A=X*Y*Z	B	D = A*B	DIESEL OR GASOLINE OR OTHER
TOTAL	SUMMATION OF X	SUMMATION OF Y	SUMMATION OF Z	SUMMATION OF A		SUMMATION OF D	TOTAL OF FUEL CONSUMED PER EACH TYPE OF FUEL

Table 13: Template for SWM fleet's emissions calculation

FOSSIL FUEL UTILISED IN SOLID WASTE MANAGEMENT FLEET	QUANTIFYING FUEL CONSUMPTION IN LITRES	FUEL TYPE-BASED ENERGY CONSUMPTION CALCULATION AND CONVERSION TO MWH	ASSESSING EMISSIONS BY FUEL TYPE AND CONVERTING CONSUMED FUEL TO TCO2 EQUIVALENT
DIESEL FUEL	X	X * 0.01 = X1	X1 * 0.268 =X2
GASOLINE FUEL	Y	Y * 0.0092 = Y1	Y1 * 0.250 =Y2
OTHER FUEL	Z	Z * ..... = Z1	Z1 * .... = Z2
	TOTAL	X1 +Y1+Z1	X2 +Y2+Z2

2.3.3 Estimating Greenhouse Gas Emissions of the Municipal Fleet

The table below shows the information needed to calculate the fuel consumption of the LA-owned and managed fleet.

Table 14: Template for municipal fleet's energy consumption data gathering

MUNICIPAL TRANSPORT	NUMBER		AVERAGE DAILY TRAVEL IN KM	FUEL CONSUMPTION IN KM		ANNUAL CONSUMPTION OF FUEL IN LITRE	
	DIESEL	GASOLINE		DIESEL	GASOLINE	DIESEL	GASOLINE
SMALL CARS							
MEDIUM CARS							
LARGE CARS							
SMALL TRUCK/BUS							
MEDIUM TRUCK/ BUS							
LARGE TRUCK/ BUS							
OTHERS							
TOTAL							

FOSSIL FUEL USED IN MUNICIPAL TRANSPORT	QUANTIFYING FUEL CONSUMPTION IN LITRES	FUEL TYPE-BASED ENERGY CONSUMPTION CALCULATION AND CONVERSION TO MWH	ASSESSING EMISSIONS BY FUEL TYPE AND CONVERTING CONSUMED FUEL TO TCO2 EQUIVALENT	
DIESEL FUEL	X	X * 0.01 = X1	X1 * 0.268 = X2	
GASOLINE FUEL	Y	Y * 0.0092 = Y1	Y1 * 0.250 = Y2	
OTHER FUEL	Z	Z * ..... = Z1	Z1 * .... = Z2	
	TOTAL	X1 +Y1+Z1	X2 +Y2+Z2	

This analysis aims to assist the LA in monitoring fuel consumption and ensuring that it aligns with the municipal fleet's uses, considering travel distance, fleet types, and ages. By utilising this table and conducting further analysis, recommendations for reducing transportation costs can be derived. These suggestions may involve exploring options such as using hybrid cars, electric cars, carpooling, and other fuel-efficient measures.

2.3.4 Assessing GHG Emissions of the Public Transportation

This section addresses Public Transportation. The objective is to assess generated emissions and identify potential measures to minimise environmental impact. Through detailed emission calculations and in-depth analyses, the LA can formulate recommendations to implement sustainable practices and adopt eco-friendly technologies within the public transportation system, paving the way towards a greener and more environmentally conscious approach to public transportation and contributing to a cleaner and healthier urban environment.

Table 15: Template for public transport's energy consumption data gathering

PUBLIC TRANSPORT	COUNT	AVERAGE DAILY TRAVEL IN KM	FUEL CONSUMPTION IN KM	ANNUAL CONSUMPTION OF FUEL IN LITRE	
				DIESEL	GASOLINE
SMALL BUS					
MEDIUM BUS					
LARGE BUS					
OTHERS					
TOTAL					

FOSSIL FUEL USED IN PUBLIC TRANSPORT	QUANTIFYING FUEL CONSUMPTION IN LITRES	FUEL TYPE-BASED ENERGY CONSUMPTION CALCULATION AND CONVERSION TO MWH	ASSESSING EMISSIONS BY FUEL TYPE AND CONVERTING CONSUMED FUEL TO TCO2 EQUIVALENT
DIESEL FUEL	X	X * 0.01 = X1	X1 * 0.268 =
GASOLINE FUEL	Y	Y * 0.0092 = Y1	Y1 * 0.250 =
OTHER FUEL	Z	Z * ..... = Z1	Z1 * .... =

2.3.5 Assessing GHG Emissions of Private Transportation

The table below shows the information necessary to calculate annual fuel consumption in private transportation.

The objective is to assess generated emissions and help identify potential measures to minimise environmental impact.

Table 16: Template for private transport's energy consumption data gathering

PRIVATE AND COMMERCIAL TRANSPORT	NUMBER		AVERAGE DAILY TRAVEL IN KM	FUEL CONSUMPTION IN KM		ANNUAL CONSUMPTION OF FUEL IN LITRE	
	Diesel	Gasoline		Diesel	Gasoline	DIESEL	GASOLINE
SMALL CARS							
MEDIUM CARS							
LARGE CARS							
SMALL TRUCK/BUS							
MEDIUM TRUCK/ BUS							
LARGE TRUCK/ BUS							
OTHERS							
TOTAL							

FOSSIL FUEL USED IN MUNICIPAL TRANSPORT	QUANTIFYING FUEL CONSUMPTION IN LITRES	FUEL TYPE-BASED ENERGY CONSUMPTION CALCULATION AND CONVERSION TO MWH	ASSESSING EMISSIONS BY FUEL TYPE AND CONVERTING CONSUMED FUEL TO TCO2 EQUIVALENT
DIESEL FUEL	X	X * 0.01 = X1	X1 * 0.268 =
GASOLINE FUEL	Y	Y * 0.0092 = Y1	Y1 * 0.250 =
OTHER FUEL	Z	Z * ..... = Z1	Z1 * .... =

2.3.6 Final Energy Consumption and Emissions in the Transportation Sector

The tables below show the transport sectors' final energy consumption and GHG emissions. These include public and private, which are significantly used within the LA.

Table 17: Final Energy consumption (MWh) in the Transport Sector

SECTOR	FINAL ENERGY CONSUMPTION [MWH]																TOTAL
			ELECTRICITY								RENEWABLE ENERGIES						
	Electricity	District heating and cooling	Natural gas	Liquid gas	Heating oil	Diesel	Gasoline		Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geo thermal	
TRANSPORT																		
MUNICIPAL FLEET																		
ROAD																		
OTHER (SOLID WASTE MANAGEMENT FLEET)																		
PUBLIC TRANSPORT																		
ROAD																		
RAIL																		
LOCAL AND DOMESTIC WATERWAYS																		
OTHER																		
PRIVATE AND COMMERCIAL TRANSPORT																		
ROAD																		
RAIL																		
LOCAL AND DOMESTIC WATERWAYS																		
LOCAL AVIATION																		
OTHER																		
TRANSPORT NOT ALLOCATED																		
SUBTOTAL																		

Table 18: Final Emissions (tCO2eq) in Transport Sector

SECTOR	CO2 EMISSIONS [T] / CO2 EQ. EMISSIONS [T]																	TOTAL
			ELECTRICITY									RENEWABLE ENERGIES						
	Electricity	District heating and cooling	Natural gas	Liquid gas	Heating oil	Diesel	Gasoline		Lignite	Coal	Other fossil fuels	Biogas	Plant oil	Biofuel	Other biomass	Solar thermal	Geo thermal	
TRANSPORT																		
MUNICIPAL FLEET																		
ROAD																		
OTHER (SOLID WASTE MANAGEMENT FLEET)																		
PUBLIC TRANSPORT																		
ROAD																		
RAIL																		
LOCAL AND DOMESTIC WATERWAYS																		
OTHER																		
PRIVATE AND COMMERCIAL TRANSPORT																		
ROAD																		
RAIL																		
LOCAL AND DOMESTIC WATERWAYS																		
LOCAL AVIATION																		
OTHER																		
TRANSPORT NOT ALLOCATED																		

2.4 Assessing Emissions from Solid Waste Landfills

This section concerns solid waste management, assessing emissions generated by landfills and identifying potential measures to minimise their environmental impact.

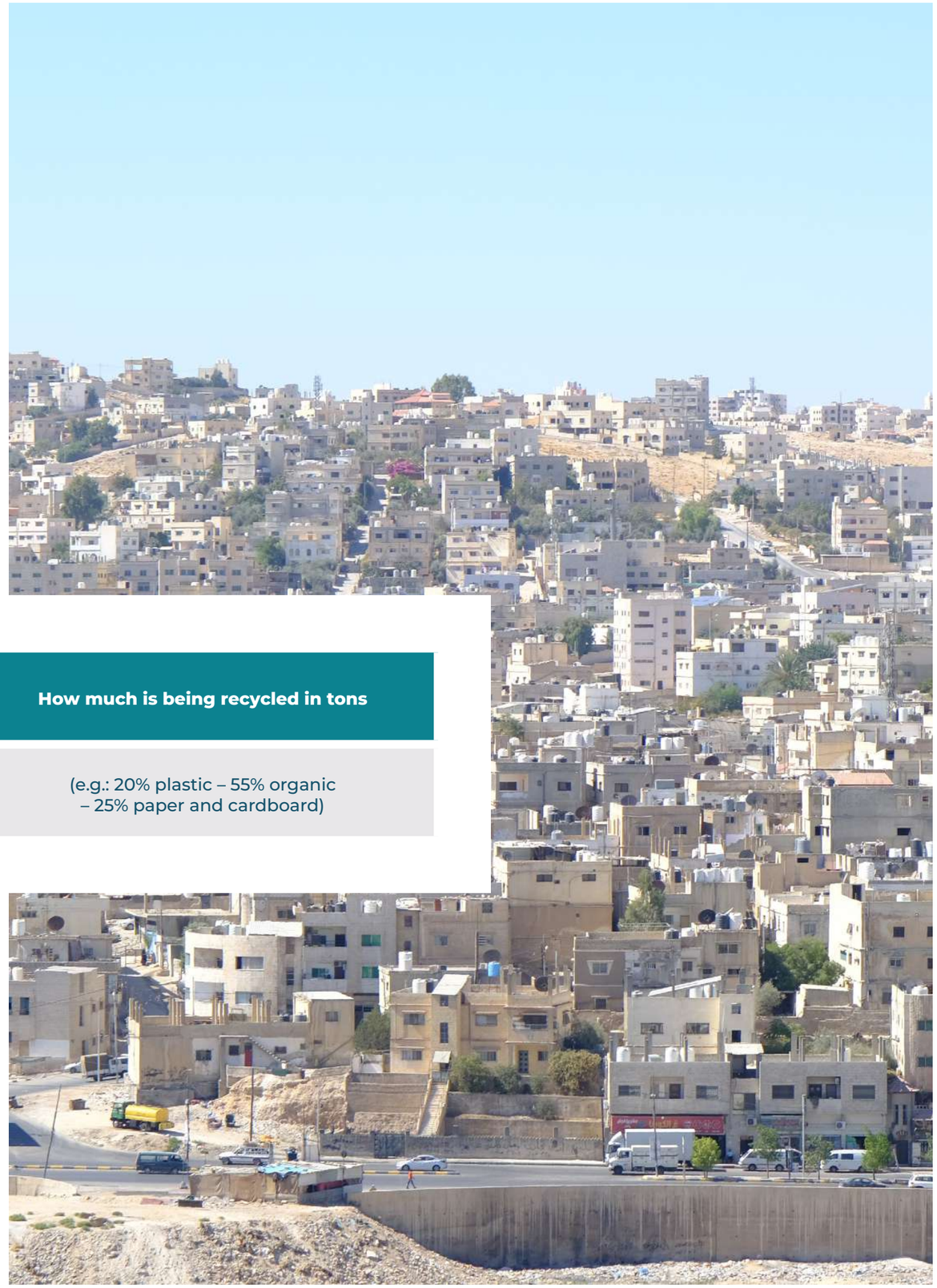
The table below shows the amounts of waste produced in the LA and its treatment status daily and annually. Next is an estimate of the methane gas, expressed in CO2-eq emissions, generated from waste deposited in landfills. It notes methane gas emissions have a higher global warming potential than carbon dioxide. Authorities responsible for the solid waste sector can provide this data.

Landfills are recognised as a significant source of methane gas emissions. This is due to the high amount of organic waste deposited there, contributing approximately 50-60% of total waste. When organic waste, including food residues, yard waste, and paper, is discarded in landfills, it undergoes anaerobic decomposition, wherein bacteria break down organic waste withoutoxygen, producing methane gas as a by-product.

solid waste	**How much waste is produced annually in tons**	**How much is being recycled in tons**		**How much is being recycled in tons**
	....tons	(Ratio of waste recycled and not dumped)		(e.g.: 20% plastic – 55% organic – 25% paper and cardboard)

According to the IPCC, every 1 kg of methane emitted equals 28 kg of CO2 equivalent. Furthermore, the IPCC notes that methane has a much higher global warming potential (GWP) than CO2, being approximately 84 times more potent, which results in a more significant warming effect over a shorter time frame.

Improving the solid waste management system of a LA is a complex issue that starts by assessing the existing conditions, including solid waste, collection, and disposal methods, distances travelled from and to disposal sites, the amount collected, the general composition of collected solid waste (Organic, plastics, cardboard, glass, wood, clothes, and others), the process applied by the LA (transports, recycles, or composts its solid waste, variations and percentage of the amount treated, and effects on public health, social and environmental conditions).



This calculation approach is applied by the simplified IPCC Default Method, in estimating methane emission for solid waste landfills:[13]

To calculate the Methane emissions from landfills, use the following equation:

Methane Emissions (Gg/year) = ((MSWT x MSWF x MCF x DOC x DOCF x F x 16/12-R) x (1-OX)

Where:

MSWT: total MSW generated (Gg/yr)

MSWF: fraction of MSW disposed to solid waste disposal sites (differs in each country)

MCF: methane correction factor (fraction), 0.6 as general default value.

DOC: degradable organic carbon (fraction) (Gg C/ Gg SW).

That can be calculated as follows:

DOC = (0.4 x A) + (0.17 x B) + (0.15 x C) + (0.3 x D)

Where:

A = Fraction of MSW that is paper and textiles

B = Fraction of MSW that is garden waste, park waste or other non-food organic putrescibles

C = Fraction of MSW that is food waste

D = Fraction of MSW that is wood or straw

To find out the composition of solid waste, this can be referred to national data or published articles for the specific country to include the given fractions in calculation. [14]

DOCF: fraction DOC dissimilated; The IPCC default value is **0.77**

F: fraction of CH4 in landfill gas **(IPCC default is 0.5)**

16/12: conversion of C to CH4

R: recovered CH4 (Gg/yr) The default value for methane recovery is zero

OX: oxidation factor (fraction); IPCC default is 0

As presented above, all conversion factors needed for calculation are explained. Once DOC is calculated, and MSWT is given, Methane Emissions (Gg/year) can be calculated.

After Methane Emissions are calculated, it is time to convert the values to tCO2-eq/a. This can be done as follows:

Methane Emissions (Gg/yr)	Methane Emissions to tCO2-eq/a
Fill in the value that is calculated above	= Methane Emissions * 1000* 28

*To convert Methane Emissions to CO2-eq/a, we multiply Methane Emission by 1000 (to convert from Gg to ton) and by 28 (for every 1 Methane is equivalent to 28 CO2 molecules)

13 https://www.ipcc.ch/site/assets/uploads/2018/03/5_Waste-1.pdf

14 https://www.researchgate.net/publication/365380784_Facts_and_Figures_on_Aspects_of_Waste_Management_in_Middle_East_and_North_Africa_Region

Table 19: Emissions fron Non-related Energy Activities

Non-energy related solid waste sectors	CO2 eq. emissions [t]	Activity data (tons)
Waste management		
Solid waste disposal		
Biological Treatment of Solid Waste		
Incineration and Open Burning of Waste		
Other		
	CO2 eq. emissions [t]	Activity data (m3)
Wastewater treatment and discharge		

2.5 Final Emissions Aggregated from Multiple Sectors

The table below shows the Energy consumption (in MWh) and their respective emissions (in tCO2-q) for each sector (Buildings & Facilities, Transport, etc.).

Table 20: Final Energy Consumption (MWh) and their respective emissions

Sector	Final energy consumption (MWh) Based on baseline year	Emission inventory (CO2 emissions [t]/CO2 eq. Based on baseline year
Building, Equipment, & Facilities	= Sum of (Municipal, Residential, & tertiary)	= Sum of (Municipal, residential & tertiary)
Municipality		
Residential		
Tertiary		
Transport	= Sum of (Municipal fleet, private cars & SWM Fleet)	= Sum of (Municipal fleet, private cars & SWM Fleet)
Municipal Fleet		
Private cars & trucks		
SWM Fleet		
Public Lighting		
SWM Landfill Emissions	Not applicable	
Total		

2.6 BAU Scenario and 2030 Targets

The emission reduction target for the CoM Med countries is set against their NDC target year (2030 or 2040 in the case of Palestine) using a business-as-usual (BAU) scenario.

According to the Joint Research Center (JRC), the BAU Coefficients that transform the emissions calculated for the BEI year into BAU emissions, against which the mitigation target is established, are listed below as examples for some countries.

Table 21: BAU coefficients for estimating GHGs (CO2-eq) in the target year

BAU Coefficients 2030[15]						
Base Year	Jordan	Lebanon	Egypt	Palestine (2040)	Tunisia	Marocco
2012	1.49	1.94	1.62	3.40	2.28	1.71
2013	1.46	1.87	1.58	3.17	2.22	1.67
2014	1.42	1.81	1.54	2.95	2.14	1.63
2015	1.39	1.74	1.49	2.77	2.07	1.59
2016	1.35	1.68	1.45	2.57	1.98	1.54
2017	1.32	1.61	1.41	2.38	1.90	1.50
2018	1.29	1.55	1.36	2.23	1.81	1.45
2019	1.26	1.49	1.33	2.07	1.72	1.41
2020	1.24	1.43	1.30	1.94	1.64	1.36
2021	1.21	1.38	1.25	1.80	1.55	1.32
2022	1.18	1.32	1.22	1.67	1.47	1.28
2023	1.15	1.27	1.19	1.57	1.39	1.23
2024	1.14	1.22	1.16	1.46	1.32	1.19
2025	1.12	1.17	1.13	1.36	1.25	1.15
2026	1.10	1.13	1.10	1.29	1.18	1.11
2027	1.07	1.08	1.07	1.20	1.12	1.07
2028	1.05	1.04	1.05	1.13	1.06	1.04
2029	1.02	1.00	1.02	1.07	1.01	1.00

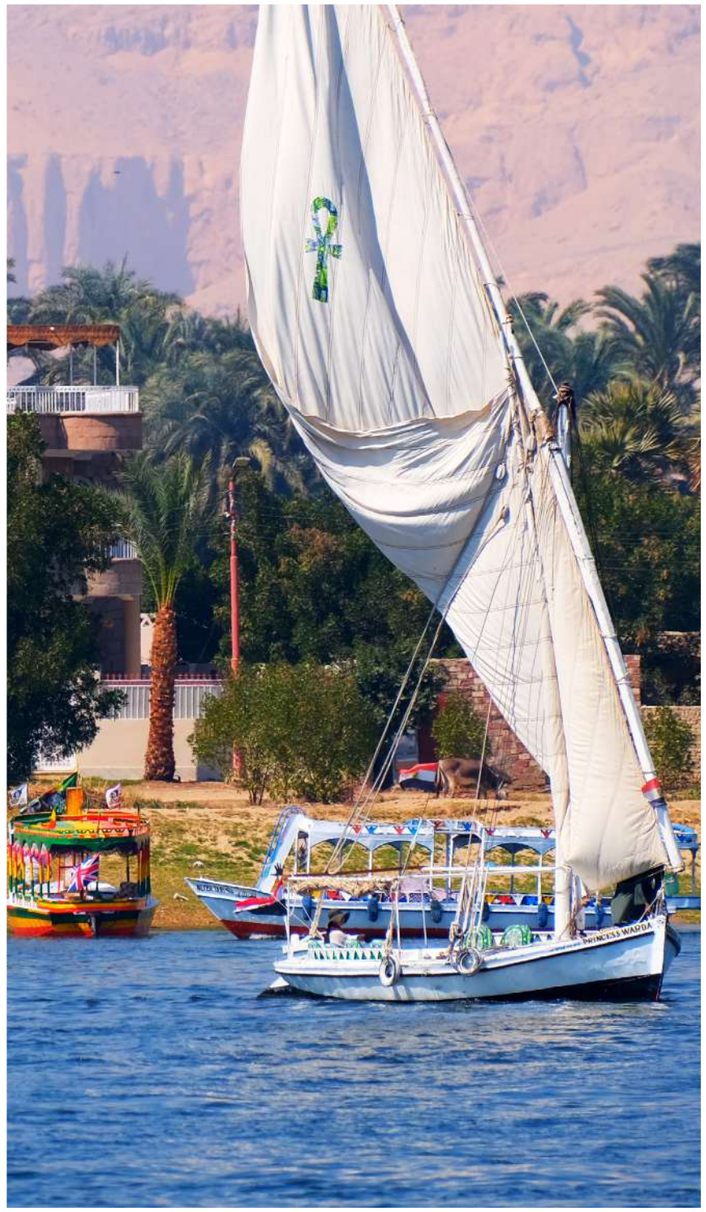
15 https://www.climamed.eu/wp-content/uploads/files/JRC-BAU-Report_Final-2021.pdf

By utilising the energy consumption, based on the baseline year data and the BEI, the LA can project the future energy consumption for the target year using the Business-As-Usual (BAU) scenario. This scenario assumes that without any intervention to reduce energy consumption, the LA's energy usage will naturally rise to a predetermined level, as indicated in the BAU table.

To tackle this issue, the LA can anticipate the surge in energy demand and devise a comprehensive plan for effectively reducing it in line with the goals outlined in the SEACAP.

The BAU data can be calculated and filled out, as shown in the table below.

Sector	Final energy consumption (MWh) based on baseline year	Emission inventory (t CO2 eq. based on baseline year	Emission inventory (t CO2 eq. At Target year based on BAU
Building, Equipment, & Facilities	Summation of below data	Summation of below data	Summation of below data
Municipality	X	Y	= Y times BAU Coefficient for BEI year
Residential	X	Y	= Y times BAU Coefficient
Tertiary	X	Y	= Y times BAU Coefficient
Transport	Summation of below data	Summation of below data	Summation of below data
Municipal Fleet	X	Y	= Y times BAU Coefficient
Private cars & trucks	X	Y	= Y times BAU Coefficient
SWM Fleet	X	Y	= Y times BAU Coefficient
Public Lighting	X	Y	= Y times BAU Coefficient
SWM Landfill Emissions	X	Y	= Y times BAU Coefficient
Total			



3

ASSESSMENT OF RISK AND VULNERABILITY[17]

3.1 Assessment of Climate Change Risk and Vulnerability

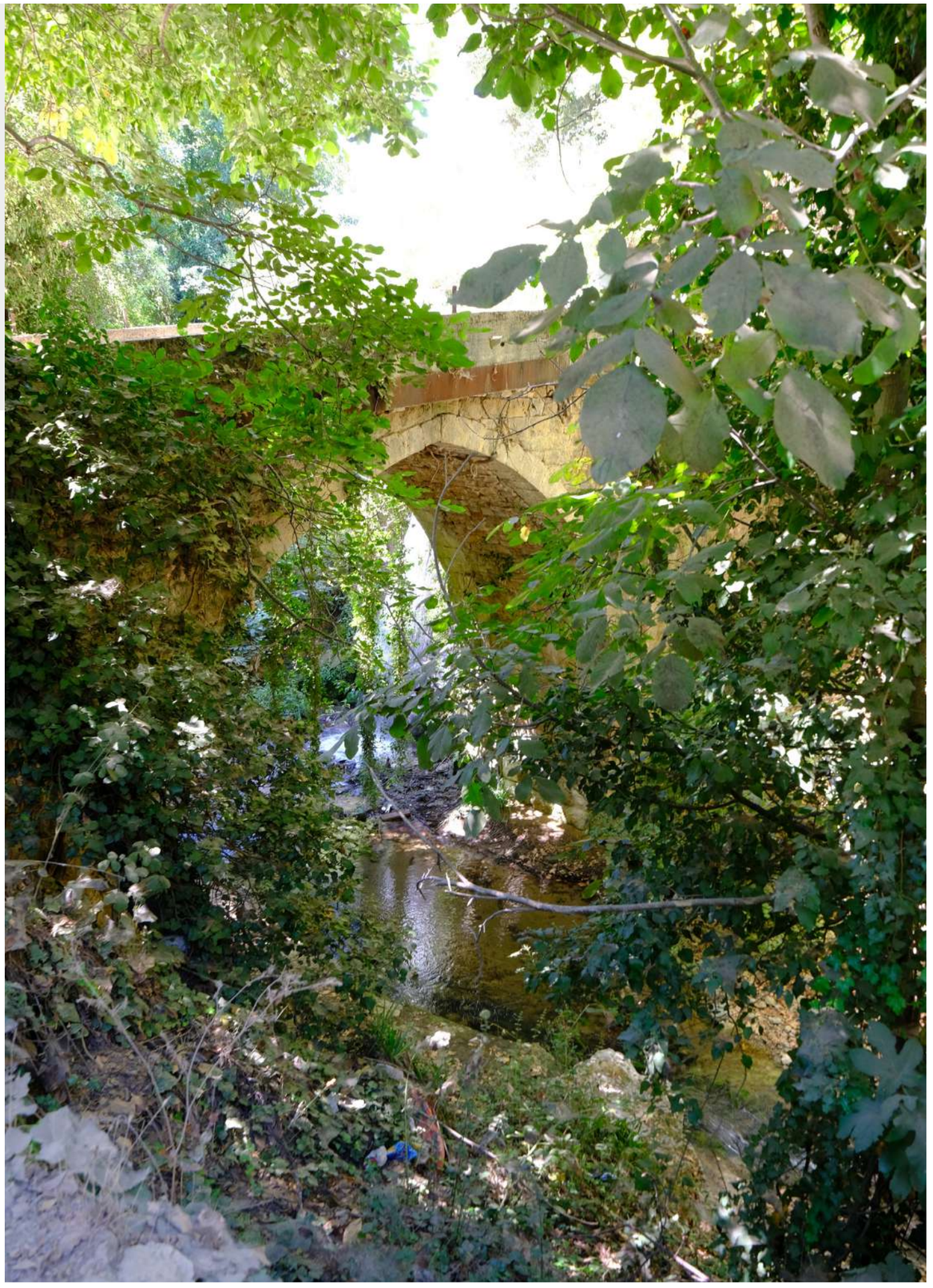
CC poses multiple challenges and seriously impacts the Mediterranean region, which is classified as a “Hot Spot”, its countries as a whole and LA. Hazards may include climate variability, seasonal precipitation, future projections, climate-related sectors of concern (e.g., water scarcity and drought), extreme episodes (e.g., disastrous floods), and pressure incited on the environment by human activities (e.g., overgrazing and firewood harvesting), effects on urban areas and population, coastal areas and infrastructures, human health, and the energy sector (e.g., growth of energy demand), and altogether repercussions on several sectors (e.g., water, wastewater, solid waste management).

A Risk and Vulnerability (R&V) assessment starts by identifying the hazards associated with CC and assessing each hazard’s potential impact on selected sectors, such as public health, the economy, agriculture, ecosystems, infrastructure, biodiversity, and affected population groups.

3.1.1 Identifying Climate Hazards and Impacts

Table A, “Current Climate Hazards,” identifies climate hazards, their probability levels (Low, Moderate, High, or unknown), and their Impact (Low, Moderate, High, or unknown)[18].

Table B identifies the climate hazards, expected change in Climate hazard intensity (Increase, Decrease, No Change or Not known, Expected change in climate hazard frequency (Increase, Decrease, No change or Not known), and the indicative timeframe in which expect the risk of climate hazard is expected to change.



17 For a simplified preparation of this section, see Annex 3: Assessing the Local Authority’s Risk and Vulnerability to Climate Change (RVA).
18 EU CoMO working SEACAP template in a .xls format is available for download here.

A: Identifying current Climate hazards

Climate hazards:	Probability of climate hazard Select one of the following choices: Low, Moderate, High or Not known	Impact of climate hazard Select one of the following choices: Low, Moderate, High or Not known
Extreme heat		
Extreme cold		
Precipitation		
Heavy rainfall		
Heavy snowfall		
Fog		
Hail		
Floods & sea level rise		
Flash / Surface flood		
River flood		
Coastal flood		
Groundwater flood		
Permanent inundation		
Droughts & water scarcity		
Storms		
Severe wind		
Tornado		
Cyclone (hurricane / typhoon)		
Tropical storm		
Extratropical storm		
Storm surge		
Lightning / thunderstorm		
Mass movement		
Landslide		
Avalanche		
Rockfall		
Subsidence		

Climate hazards:	Probability of climate hazard Select one of the following choices: Low, Moderate, High or Not known	Impact of climate hazard Select one of the following choices: Low, Moderate, High or Not known
Wild fires		
Forest fire		
Land fires		
Chemical change		
Saltwater intrusion		
Ocean acidification		
Atmospheric CO2 concentrations		
Biological hazards		
Water-borne disease		
Vector-borne disease		
Airborne disease		
Insect infestation		
Other		

B: Identifying Future Climate Hazards

Climate hazards:	**Expected change in Climate hazard intensity** Select one of the following choices: Increase, Decrease, no change or Not known		**Expected change in climate hazard frequency** Select one of the following choices: Increase, Decrease, No change or Not known	**Timeframe(s)** indicative timeframe in which you expect the risk of climate hazard frequency / intensity to change: Short term: 20-30 years from now, Midterm: after 2050, Long term: +- 2100. Multiple choice: Short-term, Mid-term, Long-term, Not known
Extreme heat				
Extreme cold				
Precipitation				
Heavy rainfall				
Heavy snowfall				
Fog				
Hail				
Floods & sea level rise				
Flash / surface flood				
River flood				
Coastal flood				
Groundwater flood				
Permanent inundation				
Droughts & water scarcity				
Storms				
Severe wind				
Tornado				
Cyclone (hurricane / typhoon)				
Tropical storm				
Extratropical storm				
Storm surge				
Lightning / thunderstorm				
Mass movement				
Landslide				
Avalanche				
Rockfall				
Subsidence				

B- Identifying Future Climate Hazards

Climate hazards:	**Expected change in Climate hazard intensity** Select one of the following choices: Increase, Decrease, no change or Not known		**Expected change in climate hazard frequency** Select one of the following choices: Increase, Decrease, No change or Not known	**Timeframe(s)** indicative timeframe in which you expect the risk of climate hazard frequency / intensity to change: Short term: 20-30 years from now, Midterm: after 2050, Long term: +- 2100. Multiple choice: Short-term, Mid-term, Long-term, Not known
Wild fires				
Forest fire				
land fires				
Chemical change				
Saltwater intrusion				
Ocean acidification				
Atmospheric CO2 concentrations				
Biological hazards				
Water-borne disease				
Vector-borne disease				
Airborne disease				
Insect infestation				
Other				

3.1.2 Identification of Vulnerable Sectors

As shown in Table C: “Vulnerable Sectors and Level of Vulnerability”, select the existing relevant hazards from Table B above, ignore the rest, and choose the pertinent corresponding sectors, the current vulnerability level and the related indicator from Annex 3, Table 1, along with a unit and numeric value, or write down your indicator.

C: Vulnerable Sectors and Level of Vulnerability

Climate hazards:	Relevant Vulnerable sector(s)	Current vulnerability level	Indicator
	Multiple choice: Buildings Transport Energy Water Waste Land use planning Agriculture & forestry Environment & biodiversity Health Civil protection & emergency Tourism Education ICT (Information & communication technologies) All listed sectors Not known	**Single choice:** Low Moderate High Not known	**Choose an indicator** from Annex 3, Table 1, along with a unit and numeric value, or write down your own indicator.
Extreme heat	[Choose from the list above]	[Choose from the list above]	[Choose from Annex 3 or write down your own]
Extreme cold	-	-	-
Heavy precipitation	-	-	-
Floods & sea level rise	-	-	-
Droughts & water scarcity	-	-	-
Storms	-	-	-
Mass movement	-	-	-
Wild fires	-	-	-
Other : Please specify	-	-	-

3.1.3 Identification of Vulnerable Population Groups

Vulnerable populations are communities or individuals at higher risk of harm or adverse effects from various environmental, social, or economic stressors, including CC. These groups may need more resources, have reduced capacity to adapt or be disproportionately affected due to a lack of a support system or existing inequalities. In the context of CC and broader societal challenges, these populations include:

- **Low-Income Communities:** People with limited financial resources may need access to climate-resilient infrastructure, healthcare, or adaptive technologies and may live in areas more exposed to hazards like flooding or heat waves.

- **Elderly Individuals:** Older people are often more susceptible to heat stress, health issues, and mobility challenges, making it harder to adapt to extreme weather conditions or evacuate during emergencies.

- **Children:** Children, especially in poor areas, are vulnerable to malnutrition, waterborne diseases, and heat-related illnesses. They are also more sensitive to the disruptions in education and social support caused by climate impacts.

- **People with Disabilities:** During climate-related disasters, individuals with physical, cognitive, or sensory impairments may have difficulty accessing critical resources, emergency services, or shelter.

- **Indigenous Communities:** Indigenous or isolated groups (e.g., Bedouins) often live in geographically and ecologically vulnerable areas, such as coastal, desert or forest regions. Their livelihoods, cultures, and traditions are closely tied to natural resources, making them more susceptible to ecosystem changes.

- **Women and Girls:** In many societies, women, particularly in low-income or ru ral isolated areas, may have less access to education, financial resources, and decision-making power, making it harder for them to adapt to and recover from climate impacts.

- **Refugees and Migrants:** Displaced people and migrants often live in temporary, informal, or substandard housing with limited access to services. They may also face language barriers, legal status issues, and reduced access to social support, making them more vulnerable to climate-related risks.

- **Farmers and Fishermen:** Communities dependent on natural resources for their livelihoods, such as agriculture or fishing, are particularly vulnerable to climate impacts like drought, flooding, or changing ecosystems.

- **Homeless People:** Individuals without stable housing are highly exposed to extreme weather conditions and lack access to essential services, such as healthcare or safe shelter, during heatwaves, storms, or cold snaps.

- **Ethnic and Racial Minorities:** In many regions, minority groups face structural inequalities, including limited access to resources, healthcare, or political representation, which can increase their vulnerability to climate impacts.

- **Population in war-torn areas:** The population in war-torn regions is affected by the classic effects of weapons of destruction, devastation, displacement, etc.

D: Linking vulnerable population groups to main climate hazards

Climate hazards:	Most vulnerable population group(s)
	Multiple choice: Women and girls Children Youth Elderly Marginalized groups Persons with disabilities Persons with chronic diseases Low-income households Unemployed persons Persons living in sub-standard housing Migrants and displaced people Other All listed population groups Not known
Extreme heat	[Choose from the Most vulnerable population group(s) above]
Extreme cold	-
Heavy precipitation	-
Floods & sea level rise	-
Droughts & water scarcity	-
Storms	-
Mass movement	-
Wild fires	-
Other	: [please specify]

3.1.4 Assessing and Enhancing Adaptive Capacity

A system, community, or organisation must adjust, manage, or cope with the impacts of CC. Adaptive Capacity is the ability to modify conditions or behaviour to expand the coping range while considering climate variability and future conditions. In practical terms, Adaptive Capacity is the ability to design and implement effective adaptation strategies to react to evolving climate hazards and reduce the likelihood of their occurrence and the magnitude of their harmful outcomes. It determines how well an area or community can respond to changes, reduce vulnerability, and recover from climate-related shocks or stresses.

Enhanced Adaptive Capacity allows communities to anticipate, prepare for, and respond more effectively to climate challenges. It is a critical element in developing successful CC action plans and should be considered at all stages of the adaptation process.

In this part of the SEACAP, the LA will assess its Adaptive Capacity by filling in the table below.

Assessment of Adaptive Capacity				
Impacted sector(s)	**Climate hazard(s)**	**Adaptive capacity factor(s)**	**Current adaptive capacity level**	**Indicator**
	Select the same hazards selected in Table A above. Ignore the rest of the hazards.	**Multiple choice: Access to services Socio-economic Governmental & institutional Physical & environmental Knowledge & innovation**	**Single choice: Low, Moderate, High, Not known**	**Choose an indicator from Annex 3, Table 2, along with a unit and numeric value, or write down your own indicator.**
Buildings		[Choose from the list above]	[Choose from the list above]	Choose from Annex 3 or write down your own]
Transport		-	-	-
Energy		-	-	-
Water		-	-	-
Waste		-	-	-
Land use planning		-	-	-
Agriculture & forestry		-	-	-
Environment & biodiversity		-	-	-
Health		-	-	-
Civil protection & emergency		-	-	-
Tourism		-	-	-
Education		-	-	-
ICT (Information & communication technologies)		-	-	-

Enhancement of Adaptive Capacity should be considered at all stages of the adaptation process, tackling the following elements:

- Institutional Capacity: The strength and readiness of local governments, organisations, and stakeholders to implement climate strategies and respond to emergencies.

- Economic Resources: Access to financial resources that enable adaptation measures, such as building resilient infrastructure or implementing new technologies.

- Human Resources: Knowledge, skills, and expertise in climate science, adaptation, and mitigation practices that can inform decisions and actions.

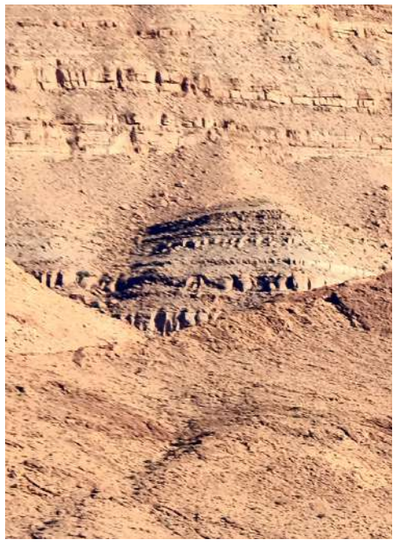
- Technology and Infrastructure: Availability of technology tools and infrastructure that support resilience, such as renewable energy, flood defences, and early warning systems.

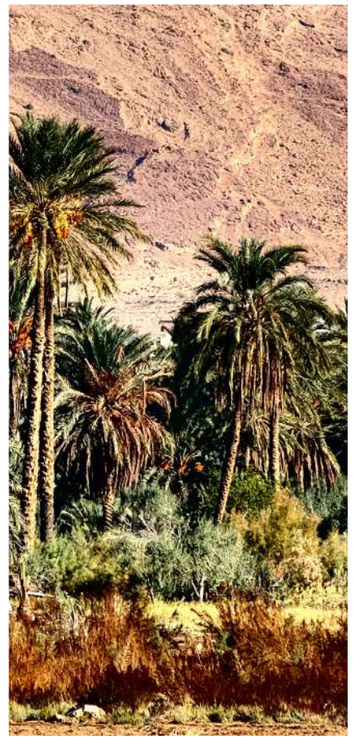
- Social Networks and Capital: The ability of communities to organise, share information, and support each other in the face of climate-related changes.

- Governance and Policy: The existence of policies, laws, and frameworks that promote adaptation and resilience-building in urban and rural planning.

4

ACCESS TO ENERGY





4.1 Assessing Access to Energy

Assessing access to energy is vital in addressing climate resilience and sustainable development, as access to energy plays a role in human activities and affects the overall quality of life. The assessment is intended to scrutinise the LA level of access to energy and energy poverty conditions, emphasising three fundamental energy attributes: secured access to energy, sustainable energy, and affordable energy[19]. Insufficient access to adequate energy services can lead to noteworthy social, economic, and environmental repercussions or impacts:

- **Social Impact:** Lack of access to energy disproportionately affects marginalised and vulnerable populations, leading to health issues, educational limitations (inadequate lighting for studying), and reduced overall well-being.

- **Economic Impact:** Limited access to energy can hinder economic development in rural and urban areas, affecting productivity and inhibiting the growth of small businesses.

- **Environmental Impact:** Dependence on traditional, often inefficient energy sources can contribute to deforestation, desertification, air pollution, and greenhouse gas emissions, exacerbating ecological challenges.

Conducting a proper Assessment of Access to Energy requires

- **Data and Metrics:** Guaranteeing the availability of accurate data on energy access and usage patterns to assess the extent of access and areas that require intervention.

- **Technological Solutions:** Identifying appropriate technologies for energy provision, considering local conditions. This may involve renewable energy sources like solar, biomass, wind, and energy-efficient appliances.

- **Policy Frameworks:** Apply national policies that prioritise energy access, promote sustainable energy solutions and address affordability issues.

- **Financial Support:** Ensuring capacity to finance sustainable energy solutions, including partnering with private investors.

To report on Access to Sustainable Energy, according to the "Energy Access and Poverty Pillar"[20] included in the Common Reporting Framework (CRF) of the GCoM, the LA needs to select at least one of the Mandatory Indicators in Table 13 and report on them. Should the LA wish to report on additional optional indicators, the Energy Access and Poverty Pillar provides more details and information.

19 In the context of CoM Med's membership, LA must address the principles of sustainable energy while analysing secure and affordable energy, which remains optional.

20 https://www.globalcovenantofmayors.org/wp-content/uploads/2023/11/CRF7-0-2023-09-14-final.pdf

Table 22: List of Mandatory Indicators for the Access to Sustainable Energy Attribute

ACCESS TO SUSTAINABLE ENERGY			
INDICATOR	**RESPONSE FORMAT OPTIONS**	**DESCRIPTION**	**EXISTING SOURCES/METHODOLOGIES**
INSTALLED CAPACITY OF RENEWABLE ENERGY WITHIN LOCAL BOUNDARY	[MW]	PROVIDE VALUE DISAGGREGATED PER TYPE OF TECHNOLOGY (WIND, HYDRO, SOLAR, ETC.)	LOCAL UTILITIES/ENERGY AUTHORITY
TOTAL ENERGY GENERATED FROM RENEWABLE ENERGY SOURCES WITHIN LOCAL BOUNDARY	[MWH]	PROVIDE VALUE DISAGGREGATED PER TYPE OF TECHNOLOGY (WIND, HYDRO, SOLAR, ETC.)	-
ENERGY CONSUMPTION FROM RENEWABLE ENERGY SOURCES	[MWH]	MUNICIPALITY TO PROVIDE INFORMATION REGARDING PPAS OR OTHER SCHEMES USED TO PURCHASE GREEN ELECTRICITY USED WITHIN THE MUNICIPALITY OR LA BOUNDARY	-
SOURCE MIX OF THERMAL ENERGY (HEATING AND COOLING) CONSUMED IN YOUR LA	[%] PER THERMAL ENERGY SOURCE	PERCENTAGE OF THE ENERGY MIX FOR EACH OF THE FOLLOWING: COAL, GAS, OIL, BIOENERGY (BIOMASS AND BIOFUELS), GEOTHERMAL, SOLAR (THERMAL), WASTE TO ENERGY (EXCLUDING BIOMASS COMPONENT)	LOCAL GOVERNMENT/UTILITIES
PERCENTAGE OF HOUSEHOLDS WITHIN THE MUNICIPALITY OR LA WITH ACCESS TO CLEAN COOKING FUELS AND TECHNOLOGIES	[1 TO 5]	QUALITATIVE 1: <10% - 2: 10.01-30% - 3: 30.01-50% - 4: 50.01-75% - 5: >75%	HOUSEHOLD SURVEYS DATA.WORLDBANK.ORG (COUNTRY LEVEL)

4.2 Carrying out Renewable Energy Projects or Actions[21]

4.2.1 Sources of Renewable Energy

Carrying out Renewable Energy (RE), especially solar energy, which is abundant in the Mediterranean region, is crucial to improving access to sustainable energy. RE is energy derived from natural resources that are replenished at a higher rate than consumed. Sunlight and wind, for example, are constantly being replenished. RE sources are plentiful and all around us.

Fossil fuels—coal, oil, and gas—are non-renewable resources that have taken hundreds of millions of years to form. When burned to produce energy, fossil fuels emit harmful greenhouse gases, such as carbon dioxide.

Generating renewable energy produces far lower emissions than burning fossil fuels. Transitioning from fossil fuels, which currently account for the lion's share of emissions, to renewable energy is critical to addressing the climate crisis. Moreover, renewables generate three times more jobs than fossil fuels.

Here are a few well-known sources of RE[22] :

Solar Energy

Solar energy is the most abundant energy resource and can even be harnessed in cloudy weather. The rate at which the Earth intercepts solar energy is about 10,000 times greater than the rate at which humankind consumes energy.

Solar technologies can deliver heat, cooling, natural lighting, electricity, and fuels for various applications. They convert sunlight into electrical energy through photovoltaic panels or mirrors concentrating solar radiation.

Although not all countries are equally endowed with solar energy, a significant contribution to the energy mix from direct solar power is possible for every country.

Wind Energy

Wind energy harnesses the kinetic energy of moving air by using large wind turbines located on land (onshore), sea, or freshwater (offshore). Although wind energy has been used for millennia, onshore and offshore wind energy technologies have evolved over the last few years to maximise the electricity produced, with taller turbines and larger rotor diameters.

Though average wind speeds vary considerably by location, the world's technical potential exceeds global electricity production, and ample potential exists in most regions to enable significant wind energy deployment.

Many parts of the world have intense wind speeds, but the best locations for generating wind power are sometimes remote. Offshore wind power offers tremendous potential. [23]

Hydropower

Hydropower harnesses the energy of water moving from higher to lower elevations. It can be generated from reservoirs and rivers. Reservoir hydropower plants rely on stored water in a reservoir, while run-of-river hydropower plants harness energy from the river's available flow.

Hydropower reservoirs often serve multiple purposes, including providing drinking water, irrigation water, flood and drought control, navigation services, and energy supply. The infrastructure needed to create hydropower can also negatively impact ecosystems. For this reason, many consider small-scale hydro a more environmentally friendly option, especially suitable for communities in remote locations.

Bioenergy

Bioenergy is produced from various organic materials called biomass, such as wood, charcoal, dung, and other manures for heat and power production and crops for liquid biofuels. Poorer populations in developing countries use most biomass in rural areas for cooking, lighting, and space heating.

Modern biomass systems[24] use dedicated crops or trees, residues from agriculture and forestry, and various organic waste streams.

The energy created by burning biomass creates GHG emissions but at lower levels than burning fossil fuels. Thus, bioenergy should only be used in limited applications, given the potential adverse environmental impacts of large-scale increases in forest and bioenergy plantations and resulting deforestation and land-use changes.

Geothermal Energy

Geothermal energy utilises thermal energy that is accessible from the Earth's interior. Heat is extracted from geothermal reservoirs using wells or other means.

Reservoirs that are naturally sufficiently hot and permeable are called hydrothermal reservoirs, whereas reservoirs that are adequately hot but improved with hydraulic stimulation are called enhanced geothermal systems.

Once at the surface, fluids of various temperatures can be used to generate electricity. The technology for electricity generation from hydrothermal reservoirs is mature and reliable and has been operating for more than 100 years.

Ocean Energy

Ocean energy derives from technologies that use seawater's kinetic and thermal energy - waves or currents, for instance - to produce electricity or heat. Ocean energy systems are still at an early stage of development, with several prototype wave and tidal current devices being explored. The theoretical potential for ocean energy easily exceeds present human energy requirements.

21 A Description table form for Access to Energy action is provided in Annex 4: Access to Energy- Action description
22 https://www.ipcc.ch/site/assets/uploads/2018/03/Chapter-3-Direct-Solar-Energy-1.pdf
23 https://www.irena.org/Energy-Transition/Technology/Wind-energy

24 https://www.ipcc.ch/site/assets/uploads/2018/03/Chapter-2-Bioenergy-1.pdf

4.2.2 Solar Panels Applications

LAS could swiftly consider and promote RE applications, starting with solar panels, noting that their manufacturing cost has plummeted dramatically in the last decade, making them affordable and often the cheapest form of electricity.

Below are three typical examples:

- **Rooftop PV systems** installed on LA edifices (municipality buildings, schools, etc.) and residential and tertiary buildings (undertaken by private investors but promoted as a concept by the municipality) are indispensable, even if small.

- **Grid-connected photovoltaic** systems have a payback period of 4 to 7 years, making them a good investment. Moreover, PV systems increase buildings' energy autonomy, considering connectivity issues in countries such as Lebanon and Palestine.

- **PV systems with water pumping stations** for drinking water and irrigation. The LA can support such installations with the private sector and potentially through energy performance contracts. The payback period for the investment in grid-connected photovoltaic systems ranges from 4 to 7 years and is considered a good investment.

The following simplified methodology and computations can be adopted to quantify the mitigation resulting from installing solar panels at different scales.

Table 23: Calculations on renewable energy production, abated emissions and investment costs

CATEGORY	SYSTEM TYPE	ANNUAL PRODUCTION MWH	GHG EMISSIONS SAVINGS TCO2-EQ		INVESTMENT COST EUR OR LOCAL CURRENCY
PV SYSTEM ON MUNICIPAL BUILDING	**KWP**	MULTIPLY ….KWP X (AVERAGE OPERATION HOURS PER DAY IN COUNTRY) X 365 DAYS (YEAR) / 1000 (TO CONVERT TO MWH) = … MWH YEARLY	MULTIPLY THE YEARLY ENERGY PRODUCED BY THE EMISSION FACTOR (EF)OF THE COUNTRY: …MWH* EF= ….. TCO2-EQ		TO BE ADDED
PV SYSTEMS ON PRIVATE BUILDINGS	**KWP**				
PV SYSTEM WITH WATER PUMPING STATIONS	**KWP**				
SOLAR FARM PV	**KWP**				
TOTALS					

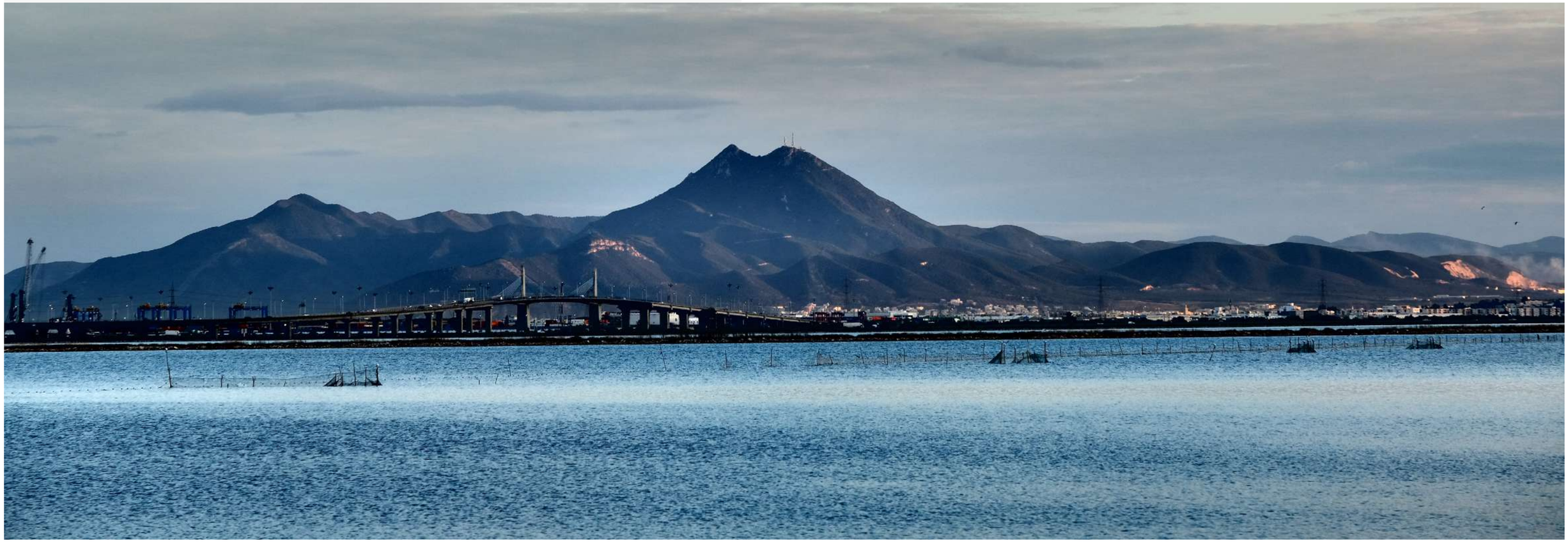
- Several methods can be used to assess the actions suggested above, including determining the installed capacity of RE within the LA's boundary (MW).

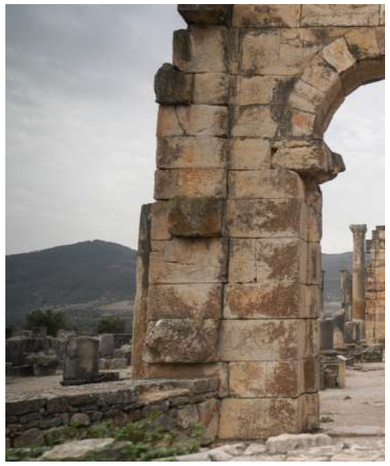
- Total energy generated from RE sources within the LA's boundaries (MWh).

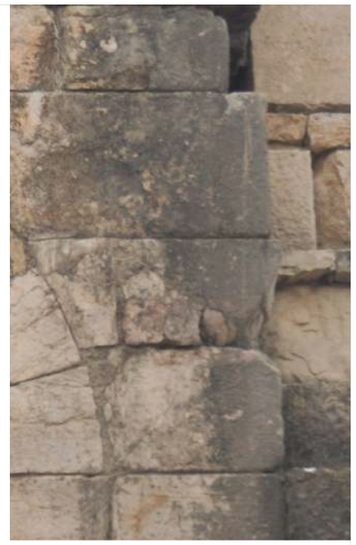
- Energy consumption from RE sources (MWh).

Engaging a professional party is essential to ensuring the project's quality design, implementation, and installation operation and securing contracts that guarantee appropriate performance and maintenance. Partnerships with private investors would guarantee the economic return on their investments and help ensure the project's sustainable operation.

Experts can first allocate the best spots for the installations, considering parameters such as solar irradiation, ownership, available surface, etc., before undertaking the overall design, feasibility and technical studies of the project(s).







5

MITIGATION ACTIONS[25]

This chapter outlines actions across various fields to reduce emissions and lead to cost savings. The development of this section's actions is to be closely aligned with the Baseline Emission Inventory (BEI) section, which deals with the inventory of energy usage and emission quantification for the relevant sectors of the actions, namely, Buildings/ equipment and facilities (Municipal, Residential, and Tertiary), Public street lighting, Transportation and solid waste, and Solid waste management.

5.1 Building Sector

The actions in the building sector can be divided into three main groups: municipal, residential, and tertiary. These groups propose similar measures to reduce energy consumption, including energy efficiency measures.

At the LA or municipal level, the relatively small number of buildings and/or their management by one specific authority (the municipality) makes it easier to collect detailed data needed to accurately quantify energy and cost savings resulting from the proposed SEACAP's mitigation actions or measures.

A more comprehensive method will be used for residential and tertiary buildings. The data from the BEI for each category will be used to estimate the energy savings resulting from the assumed reduction in energy consumption via the proposed SEACAP actions or measures.

It is suggested to structure the mitigation action's description as follows:

1. Action Title.

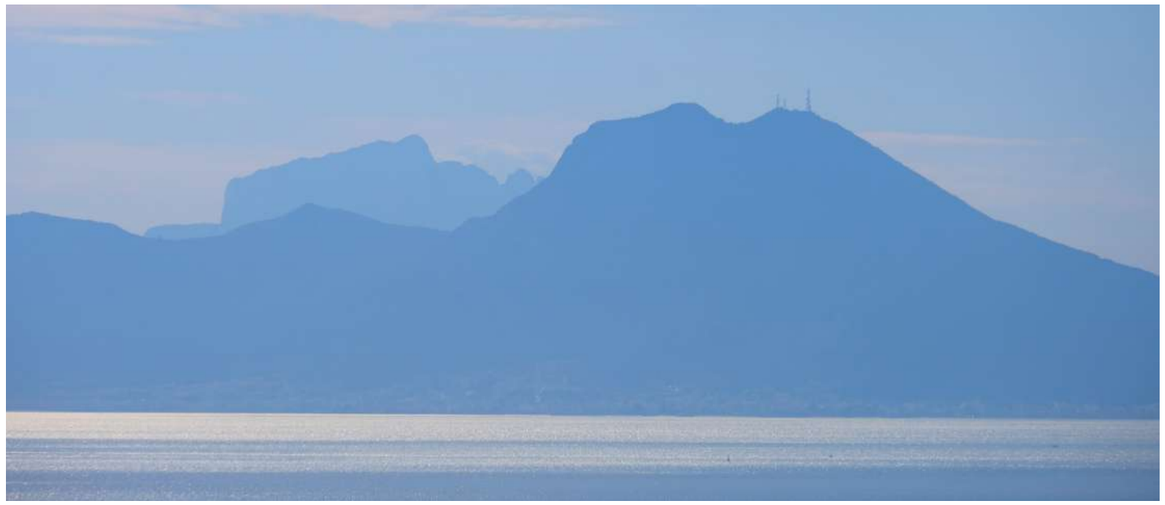
2. Background Information: Listing the building(s) or facility(s) with a brief about its function: Name; Function; Annual Energy consumption in MWh; and Emissions in tCO2-eq.

3. Description of the Action: An outline of the implementation steps and the expected outcomes in terms of emissions curtailed and energy savings/generation triggered.

4. Key Risks and Challenges: An outline of any potential risks, challenges, or obstacles that might arise and suggestions for solutions to address them. Key stakeholders that need to be involved in the implementation process to mitigate these risks should also be identified.

5. Potential Funding Sources: References to budgeting the action and different funding options, e.g., available municipal budget, national programmes, grants or donations.

[25] A simplified list of examples related to this chapter is provided in Annex 5: Selection of Mitigation Actions, and a Description table form for Mitigation action is provided in annex 7.



5.1.1 Energy Efficiency Measures for the Local Authorities Buildings and Facilities

Improving energy efficiency in municipal buildings (such as schools, offices, and hospitals) is essential to reducing energy consumption, mitigating climate change, and lowering greenhouse gas emissions. The LA's decarbonisation of these public buildings provides an opportunity to lead by example, raise awareness, and promote improved and net-zero building solutions within the community.

Several actions or measures can be taken, including the following:

- **Conducting Energy Audits** is the first step in identifying areas where energy is wasted. By identifying these areas, it will be easier to prioritise where improvements are needed to reduce energy consumption and save money on energy bills and equipment selection and use.

- **Switching to LED Lighting** uses significantly less energy than traditional incandescent bulbs or fluorescent lamps and has a longer lifespan.

- **Installing Occupancy Sensors** is an efficient way to reduce energy waste. These sensors can detect when people are in a room and automatically turn off lights and HVAC systems when the space is unoccupied.

- **Improving Insulation, including façade and roof insulation**, can significantly reduce heating and cooling costs by preventing air leaks and decreasing the energy needed to maintain a comfortable temperature.

- **Upgrading to more efficient HVAC Systems** with variable-speed compressors and programmable thermostats can result in significant energy savings and better temperature regulation.

- **Maintaining AC systems and other equipment** used in buildings reduces energy costs.

- **Building Automation Systems** can help manage energy use by controlling lighting, HVAC, and other usages automatically. This is especially applicable for large or multi-floor buildings.

- **Developing public procurement policies** that incentivise using materials with low-carbon footprints in public procurement (which represents a substantial proportion of government expenditures) is a high-impact policy arena for achieving deep decarbonisation in the infrastructure and building sectors.

The calculated reduction in energy consumption can be listed in the table below.

LA BUILDINGS ENERGY CONSUMPTION (MWH)	LIST THE MEASURES	ENERGY SAVING IN (MWH)	GHG EMISSIONS REDUCTION (T-CO2-EQ)	ANNUAL MONETARY SAVINGS PER ACTION
THE ANNUAL ENERGY CONSUMPTION ON BASE YEAR	SELECT FROM THE LIST OF ACTIONS OR MEASURES	ENERGY SAVING CALCULATED PER MEASURE / ACTION	CALCULATED EMISSION REDUCTION PER MEASURE	MONETARY SAVINGS IN ENERGY BILL
	-	-	-	-
	-	-	-	-
TOTALS	-	TOTAL ENERGY SAVING	TOTAL EMISSION REDUCTION	TOTAL MONETARY SAVINGS IN ENERGY BILLS

5.1.2 Energy Efficiency Measures for Residential Buildings

Concerning the core actions, the standard measures for residential buildings are almost the same as those applied to reduce individual building-level emissions, as presented in 5.1.1.

As in the municipal buildings section, the number of residential buildings and facilities is too high to collect comprehensive bottom-up data (numbers, energy consumed, areas' classification, number of inhabitants, and energy consumption per capita). Thus, a more holistic approach should be applied to the energy assessment per building category and the quantification of the targeted reduction.

In this regard, the LA can play a role by encouraging the applications of EE measures, raising awareness, facilitating, and to the extent possible, organising financially and legally the individual initiative of residential units' owners or occupants to initiate the application of measures that can be taken, such as the following:

- **Establishing and implementing an Energy Code** that regulates the energy performance of new and existing buildings as a regulatory measure for decarbonising the building sector.

- **Providing incentives or financial support** to make the installation of renewable energy sources more accessible and affordable should promote their use.

- **Encouraging Energy Audits:** The LA can encourage energy audits through a professional body or an energy consultant, where interested citizens cover costs while considering the owners' purchasing power and proposing affordable and practical recommendations for them.

- **Assigning a "House Doctor"** to support homeowners in improving their house insulation and recommending cost-effective energy solutions, saving money on energy bills while increasing the comfort and value of homes.

- **Switching to LED Lighting:** The use of high-quality LED lights can help households save energy and money in the long term.

- **Installing Occupancy Sensors:** These sensors can detect and automatically turn off lights and HVAC systems in common areas of residential buildings.

- **Using energy-efficient appliances:** Similarly, the LA can promote and eventually support, possibly through national programmes, the replacement of old, inefficient appliances with energy-efficient models, including upgrading HVAC Systems.

- **Promoting Deep Energy Renovation at scale** in old buildings to boost the energy performance of existing buildings.

- **Supporting integrated design at an early stage** involving all building project components enables the adoption of effective passive design measures and low-cost solutions.

- **Raising occupants' awareness** is essential by encouraging them to do the following:

  . Turn off lights and electronics when not in use, use natural light when possible,
  . Reduce heating and cooling costs,
  . Apply insulation to homes,
  . Use water-saving devices such as low-flow showerheads and faucets,
  . Fix leaky faucets and pipes promptly to prevent water waste,
  . Collect rainwater for gardening and other non-potable uses,
  . Recycle and properly dispose of waste,
  . Compost food waste and yard trimmings to reduce waste sent to landfills and
  . Choose environmentally friendly cleaning products and avoid harsh chemicals.

Energy consumption and emissions reductions can be itemised in the tables below.

RESIDENTIAL BUILDINGS ENERGY CONSUMPTION (MWH)	LIST THE MEASURES	ENERGY SAVING IN (MWH)	GHG EMISSIONS REDUCTION (T-CO2-EQ)
THE ANNUAL ENERGY CONSUMPTION ON BASE YEAR	SELECTED FROM ABOVE LIST	ENERGY SAVINGS CALCULATED PER MEASURE / ACTION	CALCULATED EMISSION REDUCTION PER MEASURE
	-	-	-
	-	-	-
	-	TOTAL ENERGY SAVINGS	TOTAL EMISSION REDUCTION

Results can further be outlined in the table below.

RESIDENTIAL SECTOR ENERGY CONSUMPTION (MWH)	GHG EMISSIONS (T-CO2 EQ)	GHG EMISSIONS REDUCTION (T-CO2-EQ)	MONETARY SAVINGS IN LOCAL CURRENCY
ELECTRICAL CONSUMPTION (H)	J= H* NEFE	F = J* ASSUMPTION OF REDUCTION DUE TO MEASURES	G= H* PRICE OF 1 MWH OF ENERGY
FUEL CONSUMPTION (Z)	D= Z* EMISSION FACTOR FOR FUEL (E.G. LPG OR DIESEL)	A= Z* ASSUMPTION OF REDUCTION	S= Z* PRICE OF 1 L OR KG OF FUEL
TOTAL: ADD H+Z	ADD J+D	ADD F+A	ADD G+S

An overview of the cost and achieved outcomes can be listed in the table below.

SOURCE OF ENERGY	CONSUMPTION MWH	ANNUAL, ENERGY SAVINGS MWH	ANNUAL MONETARY SAVING IN LOCAL CURRENCY	MITIGATION EMISSIONS, TCO2-EQ
ELECTRIFICATION OR FUEL				
IMPLEMENTATION COST				

5.1.3 Energy Efficiency Measures for the Tertiary Sector Buildings and Facilities

The same approach used for the municipal and residential sectors category (sections 5.1.1 and 5.1.2 above) can be applied to the tertiary buildings when relevant, in addition to actions for specific construction categories.

5.1.4 Measures for Municipal Public Lighting

First, a lighting study should be prepared to identify areas for improvement, detailing measures per street and path and recommending types and models of luminaires to be replaced or used. Specific actions and measures include

- **Retrofitting and replacing older street lights:** Street lighting is often LA's most significant energy expenditure. The critical process is converting public lighting to LED luminaires. to improve energy efficiency, limit costs and reduce CO2 emissions. Proper design, specification, and evaluation of LED conversion proposals are essential, as municipalities often over-illuminate with expensive LEDs that may compromise roadway user safety by creating glare and contrast problems.

- **Optimising street lighting levels** based on real-time needs further reduces energy consumption. Smart systems with remote monitoring and lighting control, using timers, motion sensors, or photocells, ensure streetlights are only active when necessary, reducing energy waste during low-traffic periods. Procuring and installing new lights with protection devices and control systems should follow EN13201 standards, determining illuminance, uniformity levels, and maintenance norms.

- **Modernising the street lights' protection components**, typically by installing surge protection, proper grounding systems, overload and short-circuit protections, astronomical timers, switching elements, energy consumption metering, differential relays, and permanent over-voltage protection.

- **Ensuring regular maintenance** of streetlights to prevent energy losses due to malfunctioning fixtures or inefficient components.

- **Minimising light pollution, e.g., shielding streetlights and directing the light downward, reduces wasted energy** and improves visibility.

The tables below quantify the reduction in energy and related costs after implementing the measures above.

Table 24: Example of Streetlight status before taking any action

TYPE OF STREET LAMPS (A1)	QUANTITIES (B1)	WATT PER LAMP (C1)		ANNUAL CONSUMPTION IN MWH (D1)	ANNUAL CONSUMPTION IN MWH (E1)
ADD THE TYPES OF STREET LAMPS (MH, HPS, LED)	QUANTITIES OF EACH TYPE	WATTAGE OF EACH TYPE OF LAMP		COMPUTE THE CALCULATION: (A1*B1*4,400[24]) /1,000,000	COMPUTE THE CALCULATION: D1*BAU FACTOR
EXAMPLE:					
HPS	20	70		6.16	20.7
MH	1700	125		935	3,141.6
LED	200	100		88	295.68
TOTAL				1,029.16	3,457.98

Table 25: Streetlight system after the action

TYPE OF STREETS (A2)	QUANTITIES (B2)	WATT PER LAMP (C2)		ANNUAL CONSUMPTION IN MWH (D2)	ENERGY SAVING IN MWH (E2)
CHANGE THE TYPES OF LAMPS THAT ARE NOT LED TO LED	KEEP THE QUANTITIES THE SAME	FOR THE NEW LED LAMPS, CHOOSE THE ADEQUATE EQUIVALENT POWER TO THE MH OR HPS PREVIOUS BULBS		COMPUTE THE CALCULATION: (A2*B2*4,400)/1,000,000	COMPUTE THE CALCULATION: D1 – D2
EXAMPLE:					
LED	20	40		3.52	2.64
LED	1700	70		523.6	414.4
LED	200	100		88	0
TOTAL				615.12	417.04

[24] 4,400 is an indicative number of annual operating hours. You need to use the one applicable for your system.

SOURCE OF ENERGY	CONSUMPTION MWH	ANNUAL, ENERGY SAVINGS MWH	ANNUAL MONETARY SAVINGS IN LOCAL CURRENCY	MITIGATION EMISSIONS, TCO2-EQ
PUBLIC STREET LIGHTING	D1	MODERNIZATION AND PROTECTION + PROCUREMENT, INSTALLATION AND MAINTENANCE OF NEW LIGHTS: ({ANNUAL CONSUMPTION (E1)) / 4400) *365 + {TOTAL ENERGY SAVING IN MWH (E2) / TOTAL ANNUAL CONSUMPTION IN MWH (D1)}*ANNUAL CONSUMPTION (E1)		ANNUAL, ENERGY SAVINGS MWH* EMISSION FACTOR
IMPLEMENTATION COST				

5.2 Transportation Sector

The rapid growth of urbanisation has had negative impacts, including deteriorating air quality, increasing road congestion, and rising energy bills for transportation. To address those pressing concerns, well-considered mobility actions should be prioritised through modern urban transportation planning and design, proposing cleaner and more efficient modes of transport, using public transportation, cycling, and pedestrian-friendly areas, facilitating access to essential public services, and improving road network planning and asset management.

5.2.1 Sustainable Mobility Measures

The first steps before prescribing transport measures are collecting information and establishing intervention needs. This includes assessing the number of cars, the type of fuel predominantly used, the amounts consumed by vehicles, the evaluation of traffic conditions, congestion, etc.

Specific actions and measures include:

- **Improving, expanding, and promoting public transportation services as alternatives to private cars and** using clean energy vehicles whenever possible.

- **Minimising travel needs** by encouraging mixed-use developments with enhanced accessibility to public transportation.

- **Optimising traffic management:** Use innovative traffic systems to improve flow and reduce congestion, considering congestion pricing to encourage public transport use.

- **Fostering active mobility:** Develop pedestrian and cyclist infrastructure, such as bike lanes and pathways, to reduce reliance on motor vehicles.

- **Promoting collective mobility** through carpooling, ridesharing and discouraging singleoccupancy use.

- **Incentivize electric vehicles:** Support the adoption of electric vehicles (EVs), the installation of charging stations, and incentives for EV ownership.

- **Raising mobility awareness:** Use “soft measures,” such as incentives and campaigns, to inform people about the impact of transportation choices.

- **Fostering green freight solutions:** Encourage businesses to adopt greener freight transportation methods, such as electric delivery vehicles.

- **Establishing multi-modal interconnected transport hubs** for seamless transfers between transportation modes, facilitating public transport use.

- **Expanding green parking** by providing prioritised parking spaces for electric vehicles.

- **Innovative parking solutions:** Installing park metres reduces congestion, encourages parked vehicles’ turnover, and improves space utilisation.

Table 26: Assessing the current status of energy consumption and emissions in the transport sector

TRANSPORTATION SECTOR	FINAL ENERGY CONSUMPTION (MWH) ACCORDING TO THE BEI YEAR			EMISSION INVENTORY (CO2 EMISSIONS [T]/CO2 EQ). ACCORDING TO THE BASE YEAR		
	FOSSIL FUELS			FOSSIL FUELS		
	DIESEL (A)	GASOLINE (B)	OTHER	DIESEL	GASOLINE	OTHER
SOLID WASTE MANAGEMENT FLEET						
MUNICIPAL						
PRIVATE AND COMMERCIAL TRANSPORT						
PUBLIC						

Table 27: BAU emissions calculation in the transport sector

TRANSPORT SECTOR	FINAL ENERGY CONSUMPTION (MWH)	EMISSION INVENTORY (CO2 EMISSIONS [T]/CO2 EQ.)	2030 BAU DEMAND*	BAU FINAL ENERGY CONSUMPTION (MWH)		BAU EMISSIONS (T CO2 EQ.)
MUNICIPAL FLEET	GET FROM BEI	GET FROM BEI	BAU FACTOR	COMPUTE THE FOLLOWING CALCULATION: A*0.250 + B*0.268		MULTIPLY THE FUEL CONSUMPTION IN MWH BY THE BAU FACTOR
PRIVATE TRANSPORTATION	SAME AS UP	SAME AS UP	BAU FACTOR	SAME AS UP		SAME AS UP
TOTAL						(D)

* For Palestine, the year 2040

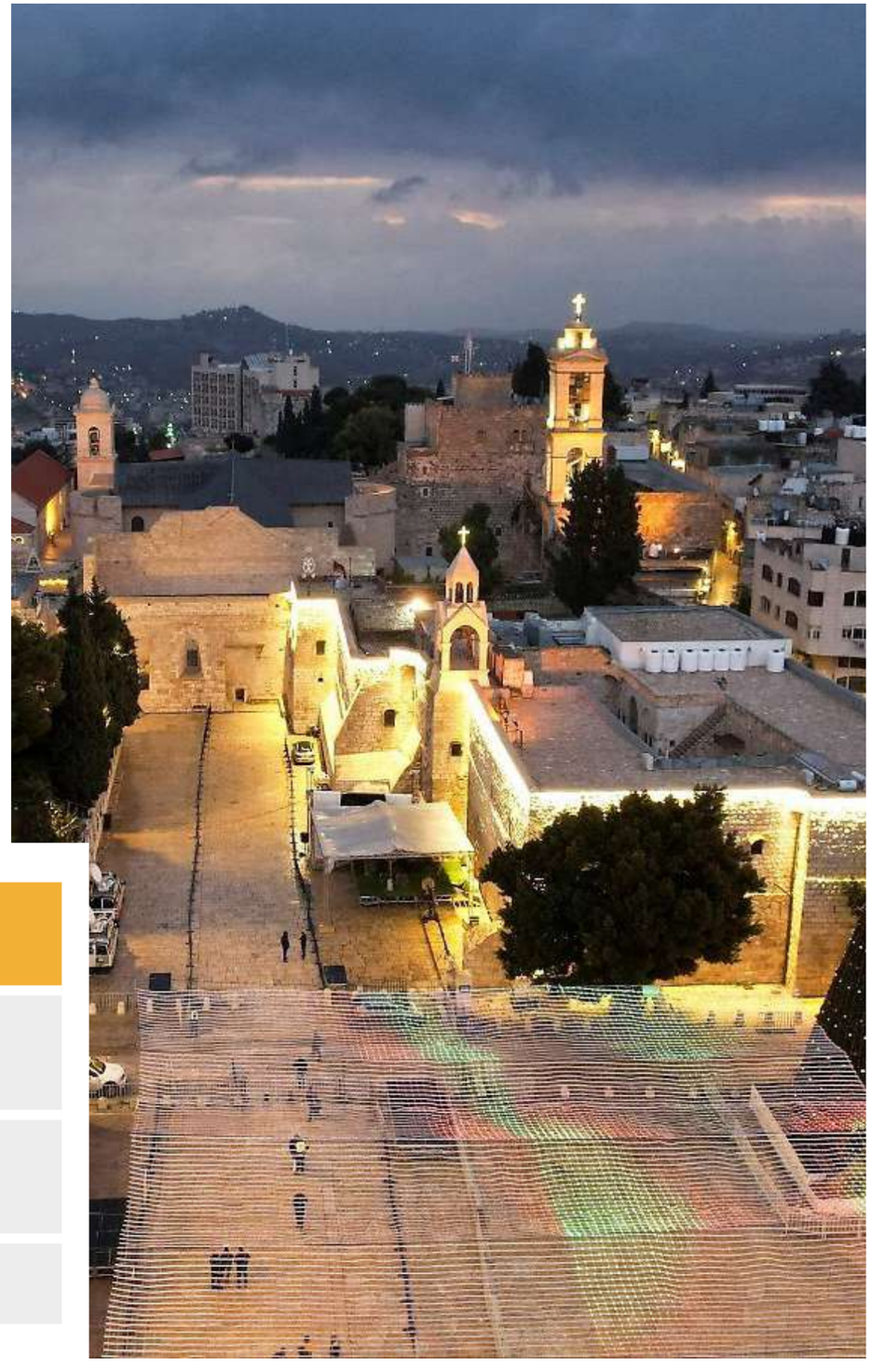


Table 28: Summary of consumption, emissions and savings in the transport sector after the action

MEASURES	2030 BAU ENERGY DEMAND (J)	2030 BAU EMISSIONS TCO2-EQ	ESTIMATED SAVINGS ASSUMPTIONS %		CALCULATED ENERGY SAVINGS MWH/A (K)	CALCULATED EMISSIONS SAVINGS TCO2-EQ (Z)
	GET FROM THE TABLE 23 CELL (D)	MULTIPLY CELL (J) BY THE EMISSION FACTOR				
IMPROVE ROAD NETWORK PLANNING			X		MULTIPLY (J) BY X%	MULTIPLY (K) BY THE EMISSION FACTOR
ROAD ASSET PLANNING			X		MULTIPLY (J) BY X%	MULTIPLY (K) BY THE EMISSION FACTOR
SUSTAINABLE MOBILITY MEASURES			X		MULTIPLY (J) BY X%	MULTIPLY (K) BY THE EMISSION FACTOR
TOTAL						

An overview of the sources and consumptions can be summarised in the table below.

SOURCE OF ENERGY	CONSUMPTION MWH	ANNUAL, ENERGY SAVINGS MWH	ANNUAL MONETARY SAVINGS IN LOCAL CURRENCY	MITIGATION EMISSIONS, TCO2-EQ
FUEL FOR TRANSPORTATION	SOURCE FROM CELL (J) TABLE 22	SOURCE FROM CELL (K) TABLE 22	MULTIPLY THE AMOUNT OF FUEL MITIGATED BY THE PRICE PER L	SOURCE FROM CELL (Z) TABLE 22
IMPLEMENTATION COST				

5.2.2 Municipal Transportation: Solid Waste Fleet Management

Specific measures can be adopted to achieve significant cost reductions through proper routing and more efficient waste collection and sorting at the source. These measures can optimise the solid waste fleet managed by LA and minimise fuel usage by reducing waste that needs to be transported and processed.

Table 29: Overview of solid waste transport consumption and emissions

MUNICIPALITY / LA	VEHICLES	DIESEL / A (LITRES)	CONSUMPTION MWH	TCO2-EQ		BAU CONSUMPTION MWH (D)	BAU EMISSIONS $TCO_{2\text{-}EQ}$
			MULTIPLY LITRES*0.001	MULTIPLY MWH* 0.268		MULTIPLY MWH*BAU FACTOR	MULTIPLY EMISSIONS* BAU FACTOR

The BEI section provides information that is essential for developing the action calculations.

The following transportation measures can be adopted:

- **Routing Design and Control** are the core actions to optimise municipal solid waste collection fuel consumption. The first step involves developing a GIS-based Model to assess the fuel consumption of vehicles collecting solid waste coherently. The **GIS-based Model** will explore and test different scenarios for effective operations. Based on its analytical applications, **Optimal Routing** is set, whereby GPS-equipped vehicles linked to a **GPS-based Vehicle and Monitoring System** (VTMS) will allow real-time vehicle movement and flow monitoring and accordingly ensure the system's efficiency.

- **Applying Sorting at the Source** optimises fuel consumption in municipal solid waste collection. It should ideally be part of the overall optimisation of the whole solid management system and follow a comprehensive Waste Sorting Plan with specific measures, such as allowing and providing containers for waste separation at the source, conducting awareness campaigns, training, and motivational programs to educate about waste sorting and its benefits, and promoting community participation.

Table 30: Energy savings & emission reductions from action(s) in the solid waste transport

MEASURES FOR SOLID WASTE TRANSPORT SECTOR	2030 BAU ENERGY DEMAND (J)	2030 BAU EMISSIONS TCO2-EQ	ESTIMATED SAVINGS ASSUMPTIONS %	CALCULATED ENERGY SAVINGS MWH/A (K)		CALCULATED EMISSIONS SAVINGS TCO2-EQ (Z)
	GET FROM THE TABLE 25 COLUMN (D)	MULTIPLY CELL (J) BY THE EMISSION FACTOR				
ROUTING, DESIGN AND CONTROL			...% THIS SHOULD BE CALCULATED	MULTIPLY (J) BY ...%		MULTIPLY (K) BY THE EMISSION FACTOR
APPLYING SORTING AT THE SOURCE			...% THIS SHOULD BE CALCULATED	MULTIPLY (J) BY ...%		MULTIPLY (K) BY THE EMISSION FACTOR
TOTAL						

Table 31 : Overview of the action's cost and outputs

SOURCE OF ENERGY	CONSUMPTION MWH	ANNUAL ENERGY SAVINGS MWH	ANNUAL MONETARY SAVINGS IN LOCAL CURRENCY		MITIGATED EMISSIONS, TCO2-EQ
FUEL FOR SOLID WASTE TRANSPORTATION	SOURCE FROM CELL (J) TABLE 26	SOURCE FROM CELL (K) TABLE 26	MULTIPLY THE AMOUNT OF FUEL MITIGATED BY THE PRICE PER L		SOURCE FROM CELL (Z) TABLE 26
IMPLEMENTATION COST					

5.3 Solid Waste Management

Sustainable Municipal Solid Waste Management results in potential GHG reduction, adding reduction in other sectors (e.g., energy, industrial processes, and transportation). At the outset, the LA should reinforce the idea that solid waste is one of the local resources that should be utilised and properly treated following the principles of circular economy to regain value from that resource and not just be disposed of untreated in landfills.

After extensive information about the sector's characteristics is collected, existing conditions are established. This starts by specifying the amount of waste, in tons, produced daily or annually, the waste composition (percentage of organic, plastic, paper and cardboard, glass, etc.), and the equivalent produced emissions, as quantified in the BEI chapter.

A tailored Solid Waste Management Plan is then developed with defined options, considering the national plans and neighbouring LA's actions. The Master Plan will identify methods and systems to apply that would include, but not be limited to, the following:

Table 32: Overview of calculated emissions from landfills

METHANE EMISSIONS GR/YR	**INSERT THE RESULT OF BEI CALCULATIONS**
METHANE EMISSIONS TCO_{2-EQ}	**MULTIPLY BY 1000*28**
BAU 2030 TCO_{2-EQ}	**MULTIPLY THE ME TCO_{2-EQ} BY THE BAU FACTOR**

- **Waste reduction through recycling and reuse**, done through solid waste sorting plants and sorting-at-the-source, reduces GHG emissions by lowering energy demand for treatment and substituting recycled feedstocks for virgin materials. This is especially true for products resulting from energy-intensive production processes such as metal, glass, plastic, and paper.

- **Landfills with gas collection and energy recovery** involving commercial recovery of landfills' CH4 as a renewable energy source have been practised at full scale along with complementary measures (recycling, decreased landfilling, alternative technologies, etc.).

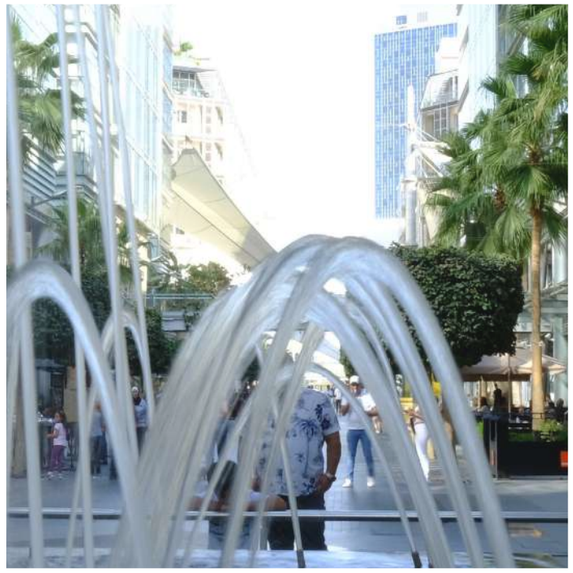
Table 33: Mitigation of GHG

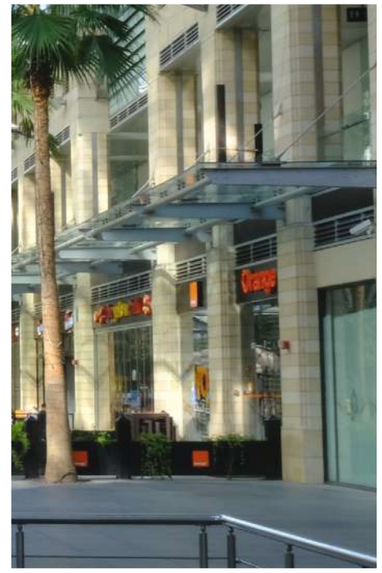
BAU2030* EMISSIONS TCO_{2-EQ}	**PLUG THE NUMBER FROM TABLE 28**
ESTIMATED MITIGATION ASSUMPTION IN %	**....%**
CALCULATED MITIGATION EMISSIONS	**MULTIPLY BAU EMISSIONS BY ...%**

*For Palestine, it should be 2040

Table 34: Solid waste actions summary table

ENERGY GENERATED (IF ANY)	EMISSIONS BAU 2030 TCO2-EQ	ANNUAL, EMISSIONS SAVINGS TCO2-EQ
	SOURCE FROM TABLE 32	SOURCE FROM TABLE 33
IMPLEMENTATION COST		





ADAPTATION ACTIONS[27]

6.1 Planning for Adaptation Actions in the SEACAP

The Intergovernmental Panel on Climate Change defines adaptation to CC as “the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Adaptation is a cross-cutting issue since it aims to enhance resilience to climate change impacts, which affect several economic sectors, including water management, agriculture, forestry, desertification, health, energy, transport, tourism, fisheries, natural resources, and ecosystem-based services. Early action will save on damage costs later: the earlier we implement adaptation responses, the less it will cost to address climate change in the future and the better equipped we will be to cope with climate change challenges.

Similar to mitigation, it is essential to establish the organisational management structure (which is likely successful if a cross-departmental or cross-disciplinary team leads it), ensure political interest and early and long-term commitment from policymakers, establish adaptation as part of the SEACAP vision, and secure financial resources for adaptation from the public and private sectors.

6.2 Adaptation Actions and Measures

Adaptation options range from actions that build adaptive capacity (e.g. knowledge creation and sharing of information, creating supportive institutional frameworks) or establish management systems and supportive mechanisms (e.g. better land management planning, insurance mechanisms) to adaptation actions implemented on the ground, e.g. physical or ecosystem-based measures.

Measures must be implemented at the proper spatial scale, fit the specific local context, and comply with national and subnational regulations and plans. Even though implemented at the local scale, adaptation options often require coordination with higher levels of governance to ensure sustainable and harmonised spatial planning for the whole region[18].

As listed below, a broad spectrum of adaptation actions and measures can be considered and prioritised in many areas.

[27] A simplified list of examples related to this chapter is provided in the annex 6 at the end of the document, and a Description table form for Adaptation action is provided in annex 7

[28] https://climate-adapt.eea.europa.eu/en/knowledge/adaptation-information/adaptation-options

6.2.1 Public Health

Importance should be given to addressing the impacts of CC on public health should be important, considering that the frequency and severity of heat waves, extreme weather events, air pollution, and the development of vector-borne diseases negatively influence health, resulting in increased heat-related illnesses, even permanent disability or death. Besides, high temperatures can cause water scarcity, which may lead to crop contamination and the spread of pathogens, mainly due to the use of untreated water for irrigation.

- The LA should develop a common culture for managing heatwaves and their health, environmental, and economic consequences and formulate action plans to manage extreme weather events. The plans should focus on protecting the most vulnerable citizens. Potential measures and actions include :
  - Setting up monitoring procedures,
  - Establishing early warning systems and hotlines that provide recommendations for staying calm and healthy,
  - Instituting emergency protocols, such as evacuating tropical or sandstorm early warnings,
  - Providing easy access to public water points, such as drinking fountains, swimming pools (if any), mist cooling systems in public spaces, and spray pads,
  - Opening cooling centres where the public can gather for relief from the heat and update working hours for outdoor workers during heat waves,
  - And above all, increasing the capacity of public health workers to manage climaterelated health risks.

6.2.2 Urban Development and Management

CC significantly impacts and causes considerable damage to all types of infrastructure, including buildings, transportation, electricity, and water systems. SEACAP-related adaptation plans for the built environment can define ways to counter such damage through many measures and actions, including:

- Promoting the design and construction of green buildings and climate-resilient homes, especially in vulnerable informal housing areas. Call for change in construction regulations, first to improve insulation and decarbonise buildings.
- Adapting urban space design and building density and enhancing public realm features such as walking and cycling routes[29].
- Planting green corridors, street trees, green rooftops (to reduce summer heat, provide winter installation, and reduce stormwater runoff), and urban tree canopies, as well as increasing, improving, and valorising green spaces in fresh areas, favouring plant species adapted to local climate conditions.
- Implementing cool surfaces like white roofs and walls and promoting cooling materials on roofs and pavements.
- Installing permeable pavement increases the natural infiltration of rainwater and reduces stormwater runoff. The aim is to capture, use, or absorb stormwater runoff in urban areas.

6.2.3 Water Management

Water management is at the centre of the climate crisis, and most climate change impacts involve water[30]. Climate change affects the world's water in complex ways, from unpredictable rainfall patterns to shrinking ice sheets, rising sea levels, floods, and droughts. Moreover, rising temperatures disrupt precipitation patterns and the entire water cycle, exacerbating water scarcity and water-related hazards (such as floods and droughts) (UNICEF).

About two billion people worldwide lack access to safe drinking water today (SDG REPORT 2022), and roughly half of the world's population experiences severe water scarcity for at least part of the year (IPCC). These numbers are expected to increase, exacerbated by CC and population growth (WMO).

According to the IPCC, the facts are alarming:

- Water supplies stored in glaciers and snow cover are projected to decline further over the century, reducing water availability in some areas of the World.
- Sea-level rise is projected to extend groundwater salinisation, decreasing freshwater availability for humans and ecosystems in coastal areas;
- Limiting global warming to 1.5°C compared to 2°C would approximately halve the proportion of the world population expected to suffer water scarcity;
- Water quality is also affected by CC, as higher water temperatures and more frequent floods and droughts are projected to exacerbate many forms of water pollution;

[29] The public realm refers to all accessible spaces, such as parks, streets, and plazas, vital in fostering community interaction and identity. Optimising the public realm enhances urban liveability and sustainability by providing inclusive, safe, and engaging environments for diverse activities. As urban planners increasingly focus on the public realm, understanding its impact on social cohesion and public health is essential for future city development.

[30] https://www.un.org/en/climatechange/science/climate-issues/water

Specific adaptation measures and actions

Water solutions should be integrated into national and local-level water regulations, policies, and standards to improve water supply, treatment, reuse, adapt irrigation techniques, and conserve and rehabilitate rivers and ponds. Specific measures include:

- **Wise Water Management** involves diligently monitoring and managing water use, promptly fixing leaks, and installing water meters to track consumption. Water-efficient appliances and practices should also be implemented.
- **Protecting wetlands** such as mangroves, seagrasses, marshes, and swamps, which are highly effective carbon sinks that absorb and store CO2, helps reduce GHG. Wetlands also serve as a buffer against extreme weather events, provide a natural shield against storm surges, and absorb excess water and precipitation[31].
- **Climate-smart agriculture,** Using drip irrigation and other water-efficient methods, climate-smart agriculture can help reduce the demand for freshwater supplies[32].
- **Early warning systems** for floods, droughts, and other water-related hazards provide a more than tenfold return on investment and can significantly reduce disaster risk. For example, a 24-hour warning of a storm can reduce the ensuing damage by 30 per cent.
- **Manage water consumption in the community:** Take measures to reduce water usage, including encouraging water conservation behaviour programs and the use of unconventional tap water systems.
- **Sustainable management of stormwater,** favouring its infiltration and limiting the extent of impervious surfaces.
- **Create storage of collected rainwater** during winter to use during heat events.
- **Establish underground reservoirs** and rainwater collection projects.
- **Expand wastewater reuse** through wastewater treatment plants to replace using freshwater supplies under stress).
- **Monitor pipeline and water pumps** and ensure necessary maintenance and continuous examination of water quality, leakage and loss.
- **Promote saving money** and water with simple changes in home habits, such as using a rain barrel and running your washer only when necessary.

[31] UNEP : https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/35360/NatClim.pdf

[32] UNEP: https://www.unep.org/news-and-stories/story/five-threats-water-sustains-our-farms

6.2.4 Drought and Desertification

Drought:

Global warming increases the risk of drought in several ways. Moreover, its impacts are strongly exacerbated by anthropological activities such as deforestation, overgrazing, soil degradation, and water mismanagement. Drought exacerbates the consequences of these activities, creating a vicious cycle of ecological degradation and human misery[33]. A whole set of measures—emerging from national drought policies and risk management plans—need to be implemented to increase resilience to drought and minimise its effects.

Integrated proactive drought measures, which are essentially part of water management (6.3.3), include:

- **Water conservation and storage:** The first step in preparing for a prolonged drought is efficiently conserving and storing water and implementing water-saving technologies, such as using low-flow fixtures and collecting rainwater in storage tanks. During dry periods, rainwater can serve as a valuable resource[34].
- **Drought-resistant landscaping:** Replace water-thirsty green areas, lawns, and plants with drought-resistant landscapes. Native plants and xeriscaping techniques can significantly reduce outdoor water consumption[35].
- **Upgrade irrigation systems** to use precise irrigation techniques, such as drip irrigation and smart irrigation controllers.
- **Implement soil health practices:** Adding organic matter, mulching, and reducing soil compaction can improve soil health and make it more resilient to dry conditions.
- **Install rainwater harvesting systems** on rooftops and other impermeable surfaces to collect and store rainwater for future use. This will reduce the strain on traditional water sources during droughts.
- **Crop and plant selection:** Choose drought-resistant crop varieties and adjust planting schedules to align with more favourable weather conditions. Crop rotation and diversification can also reduce vulnerability to drought-related crop failures.
- **Consider diversifying water sources** to ensure a reliable water supply during droughts. Investing in wells, desalination, or wastewater treatment systems can provide alternative water sources when surface water becomes scarce.
- **Prepare Emergency Drought or Water Plans:** Create contingency plans for water scarcity emergencies. Identify alternative water sources and establish a strategy for distribution and rationing if necessary. Educate the community about these plans to ensure everyone is on the same page.
- **Invest in climate-resilient Infrastructure:** As droughts become more frequent and severe, investing in infrastructure that can withstand these challenges is crucial. This includes reinforcing dams, reservoirs, and water treatment facilities to ensure they can continue to supply water during extended dry periods.

[31] https://www.idos-research.de/uploads/media/BP__23.2017.pdf
[34] https://www.bigditch.com.au/unpredictable-drought-ravages-nsw-a-farmers-tale-of-struggle/
[35] https://www.bigditch.com.au/sydney-should-prepare-for-future-water-shortages/

Desertification:

Global warming would significantly affect the world's already hot deserts. Even small changes in temperature or precipitation could drastically impact plants and animals living in the desert. Moreover, global warming is predicted to increase the area of deserts, which already cover a quarter of Earth, and increase the incidence of drought, which dries up water holes. Higher temperatures may also produce more wildfires, which alter desert landscapes by eliminating slow-growing trees and shrubs and replacing them with fast-growing grasses.

Human activities such as gathering firewood and grazing animals exacerbate desertification, converting semiarid regions into deserts. Population growth and the greater demand for land are serious obstacles to combating this problem.

Desertification can be reduced by adopting multiple strategies, including:

- **Afforestation** is an excellent way to reduce the risk of desertification. Tree roots bind the soil together, and leaves provide shade to prevent the ground from drying out. Additionally, leaf litter is used for nutrient cycling.
- **Magic stones** (or bunds) are circles of stones placed on the ground to hold water on the soil rather than letting it run quickly over the surface.
- **Plant sand-fixing bushes, trees, and plants with adaptation characteristics** that can survive in a hot desert environment. These include small leaf plants, tap roots, spine plants, plants with thick, waxy skin surfaces and succulent plants.

6.2.5 Management of Natural Risks

A Natural Risk Management Plan should be prepared whenever conceivable, covering floods and flush floods, forest fires, landslides, and other natural hazards in pre-determined frequent hotspots and risk areas. Possible measures and actions include

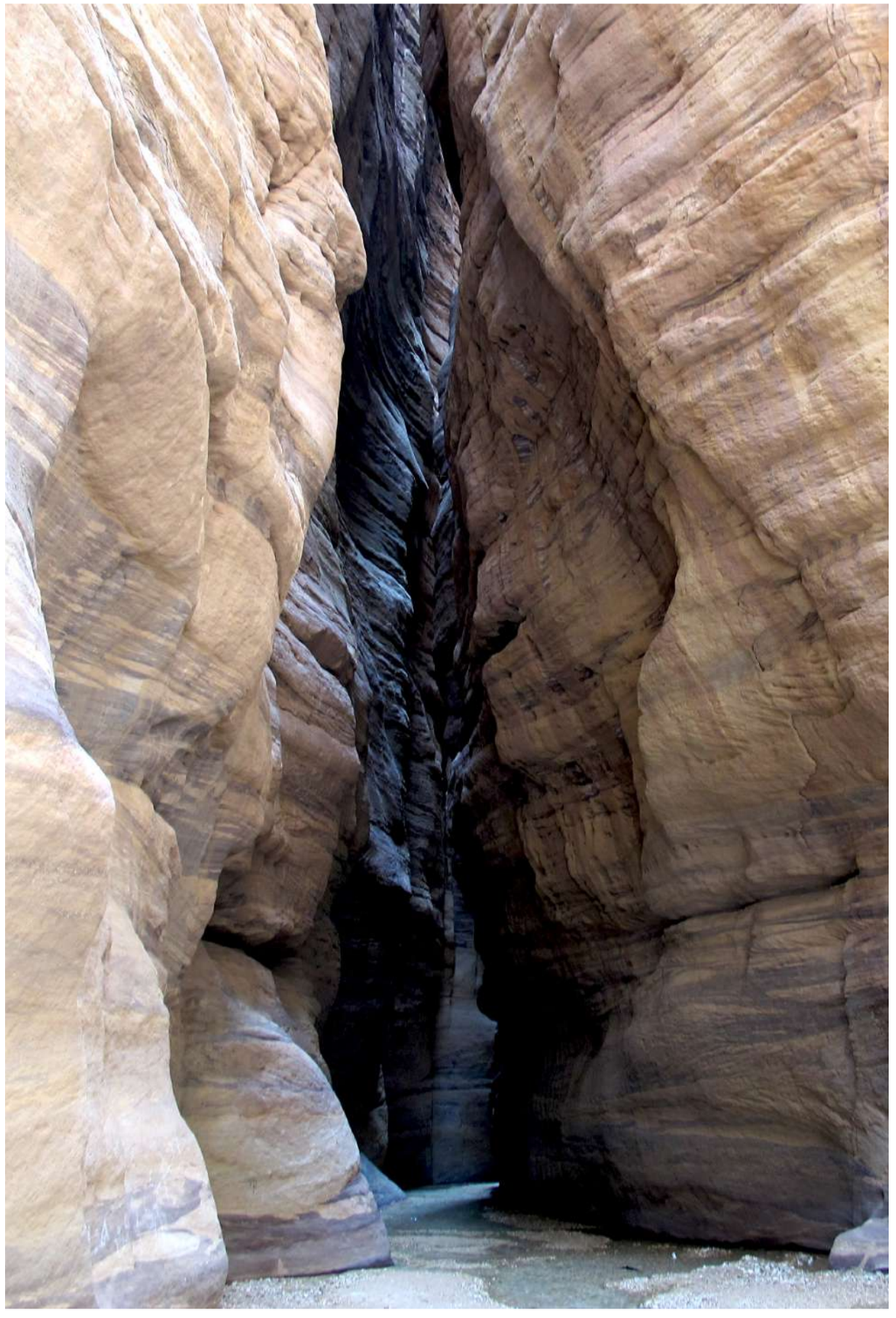
- **Developing emergency evacuation plans during flash floods** with established risk management protocols, especially for schools and public buildings and early-warning systems that aim to save lives, assets, and livelihoods.
- **Building flood defence walls and barriers.** Building such breakwater structures protects beaches from coastal erosion caused by intense storms and sea-level rise.
- **Floodplain alteration** through re-profiling, removing obstructions, and lowering the ground level beneath bridge arches.
- **Ensure protection from wildfires** through multiple measures, e.g., encourage the establishment of community forests to control soil erosion.

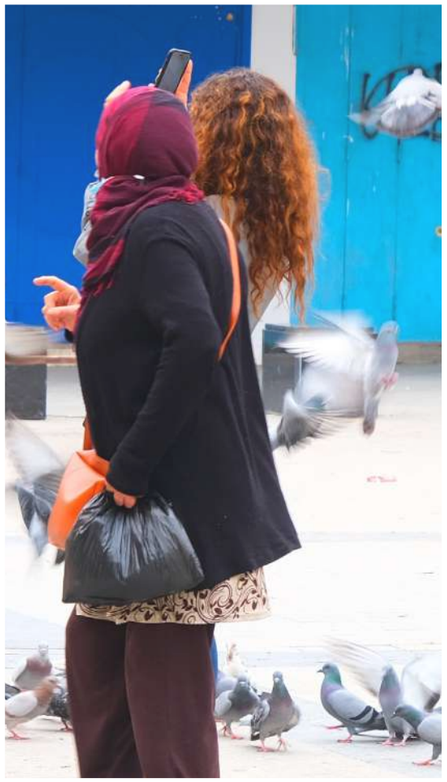
6.2.6 Note on Nature-based Solutions

Nature-based Solutions (NbS) are economically viable and sustainable solutions to many climate change and biodiversity challenges. They are generally more cost-efficient long-term than technological investments or infrastructure construction and maintenance.

The table below lists some NbSs that are applied to some hazards.

HAZARDS	NATURAL BASED SOLUTIONS
MOUNTAINS, FORESTS AND WATERSHEDS	
LOSS OF LIFE AND ASSETS DUE TO INTENSE WILDFIRES	FOREST MANAGEMENT TO REDUCE RISK OF SUPER FIRES
LAND SLIDE, SOIL LOSS, AND SILTATION DUE TO INTENSE RAINFALL	PROTECT AND RESTORE FORESTS TO STABILISE SOILS AND SLOW WATER RUN OFF
RIVERS AND WETLANDS	
ASSET LOSS, YIELD REDUCTION AND CONTAMINATION DUE TO FLOODING	RESTORE WETLANDS TO ABSORB AND PHILTRE FLOODWATERS
REDUCED ALL INTERMITTENT RIVER FLOW DUE TO DROUGHT SOLUTION	PROTECT AND RESTORE FORESTS AND WATERSHEDS TO REGULATE FLOW
FARM LAND	
CROP FAILURES AND LIVESTOCK LOSS DUE TO DRAUGHT	AGROFORESTRY TO MAKE BETTER USE OF SOIL MOISTURE AND REDUCE EVAPORATION
ASSET LOSS, YIELD REDUCTION AND TRANSPORT DISRUPTION DUE TO FLOODING	PROTECT AND RESTORE FORESTS TO SLOW WATER RUN OFF
CITIES	
URBAN FLOODING DUE TO INTENSE RAINFALL	RESTORE WATER COURSES, EXPAND GREEN SPACES, AND INTRODUCE POLES SURFACES TO REDUCE FLOOD RISK
HEAT STRESS DUE TO URBAN HEAT ISLANDS	EXPAND GREEN SPACES IN AND AROUND CITIES
COASTAL AREAS	
LOSS OF LAND, LIVELIHOODS AND ASSETS DUE TO RISING SEA LEVELS AND COASTAL EROSION	RESTORE COASTAL WETLANDS, INCLUDING ENHANCE ENGINEERED MEASURES
LOSS OF LIFE AND ASSETS DUE TO STORM A SURGES AND INUNDATIONS.	PROTECT AND RESTORE MANGROVES, MARSHES, AND LEAVES TO BUFFER COASTS AND ABSOLUTE FLOODWATERS
SALINISATION DUE TO SEA LEVEL RISE AND SEAWATER INUNDATION.	RESTORATION OF DEGRADED MANGROVES AND INTEGRATED MANGROVE FISHERY FARMING SYSTEM.





REFERENCE TO POTENTIAL SOURCES OF FUNDING

Subnational governments need substantial assistance to secure the finances of climate projects. To help address this crucial need, the Clima-Med project has produced a “Climate Finance Guidebook” (CFG), a guiding document to support LAs in this endeavour.

https://www.climamed.eu/wp-content/uploads/files/Clima-Med-Climate-FinancesGuidebook-2023-_com.pdf

The CFG recommends ways to facilitate funding for projects identified in the SEACAPs and similar stand-alone climate actions located within the boundaries of subnational entities and led or promoted by local or central authorities.

The publication consists of a central part that advances common elements of success and recommendations for all countries. Seven “Framework Conditions for Climate Finance” annexes, including specific recommendations, are attached to the central part, as each country’s conditions and particular needs differ.

7.1 Funding Models

The funding models and applications tackled by the CFG cover the following

- Section 1 briefly introduces climate finance’s state of play.
- Section 2 deals with national-level actions to enable local climate finance, covering

  (i) National policies and regulations applied to enable local-level climate finance;

  (ii) Enhancing the role of national development banks as intermediary actors to channel funds to cities to finance their climate actions; and

  (iii) Supporting the establishment and operations of the super-ESCO Model to endorse local climate action and

  (iv) Integrating green and climate criteria into concessions and Public-Private Partnerships (PPP).
- Section 3 deals with local authorities’ strategies for financing SEACAP actions covering

  (i) Best practices to mainstream SEACAPs’ implementation into Green Public Procurement;

  (ii) Asset contribution by cities instead of cash in PPPs and

  (iii) Crowdfunding for Climate Change.
- Section 4 discusses Clima-Med’s proposal to establish a SEACAP Support Mechanism (SSM) for each country as a national instrument for preparing and funding the SEACAPs.
- Section 5 covers ways to strengthen cooperation with international financing institutions (IFIs).

The ”Framework Conditions for Climate Finance,” annexed to each country’s guidebook, presents a selected set of rules, regulations, structures, and examples relevant to the overall effort to scale up climate finance in that country.

7.2 Funding Options for the SEACAPs

Below is a list of some SEACAP funding options recommended in the CFG:

- **Municipal Budget:** As LA allocate a portion of its annual budget to public infrastructure projects, it should take climate action needs in such allocation.
- **Local Taxes and User Fees,** similar to property taxes and waste collection and disposal services fees, can be generated for climate actions.
- **National Grants:** LAs should explore and seek grants, financial incentives, and special funding for climate actions provided by national governments.
- **Private Investment:** LAs can seek investment from private investors whenever applicable to municipal projects.
- **Energy Efficiency programs should be explored:** These programs aim to reduce energy consumption and can help offset the initial costs.
- **Public-Private Partnerships (PPPs):** PPPs typically involve long-term agreements where the private entity invests capital in exchange for revenue sharing or other arrangements, allowing the distribution of financial burden and expertise. PPP schemes are typical in financing, installing, and maintaining street lighting, waste management, and transportation.
- **International Funding Institutions (IFIs):** LAs should explore funding opportunities from international, regional and multilateral organisations and development banks.
- **Nonprofits and Foundations** offer grants for sustainable development, environmental conservation and climate actions that reduce GHG.
- **Corporate Sponsorship:** Businesses committed to international, national and local sustainability offer sponsorship or donations.
- **Crowdfunding and Community Fundraising:** Engaging the community through crowdfunding platforms, fundraising events, or volunteer efforts.
- **Energy Performance Contracts (EPCs):** Partnerships between LAs and energy service companies to finance and maintain service are commonly applied, mostly with street lighting.
- **Community Bonds:** Engage residents and community members through community bonds for investment and returns.
- **Special Assessments:** LAs may impose special assessments on properties benefiting from improved services, such as street lighting or solid waste collection. Based on these assessments, property owners within the designated area are responsible for covering a portion of the service cost.
- Revenue from Advertising: In some cases, LAs can partner with advertisers to display advertisements on street furniture, such as bus shelters or informational kiosks, to generate revenue that can be reinvested in public infrastructure, such as street lighting.

7.3 Sources of Funding

Sources of funding may differ, depending on the sector of the projects, e.g. waste, renewable energy and transport:

Funding of solid waste management operations:

- **User Fees:** the standard user fee for delivering waste services, including charging commercial and industrial establishments based on the volume or weight of waste they generate.
- **Selling recycled materials and compost:** Cities may recover costs by selling recycled materials and compost, generating energy from waste and establishing a financial deposit system on certain products (e.g., water bottles, plastic bags and batteries).
- **Landfill Fees:** Revenues from landfill fees, which are charges on waste disposal at landfills, can help fund waste management infrastructure and recycling programs.
  - **Public-private Partnership:** Waste collection and some waste disposals are contracted to private operations without public budget support. Private costs are covered through service provision, and private operators directly collect user fees to cover expenses.

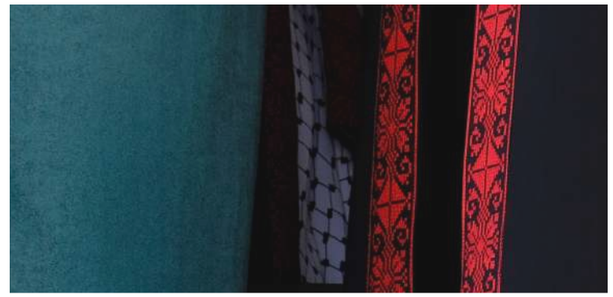
Financing Energy Efficiency and Renewable Energy

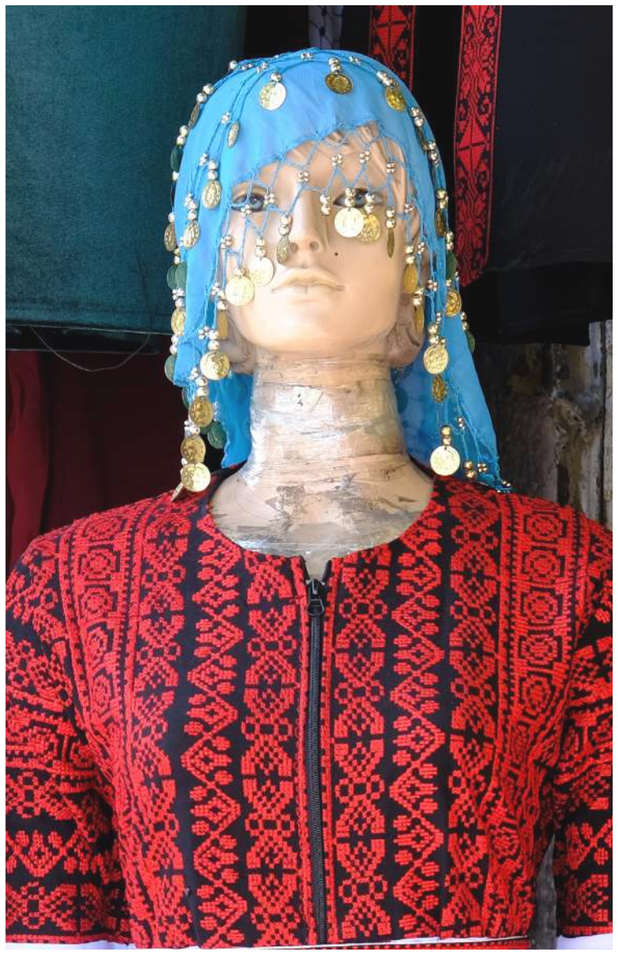
- **Energy Performance Contract** is an approach designed to assist public sector organisations in retrofitting their buildings by installing energy conservation measures to reduce carbon emissions and achieve substantial guaranteed annual cost savings..
- **Energy Services Agreement:** Equipment is owned and operated by the energy-efficiency company and not the host, and as such, equipment financing costs are bundled into the fee for service. In this scheme, there are no upfront costs to the host, and the energy services company manages and maintains the operation.
- **Power Purchase Agreement (PPA):** A PPA is a legal contract between an electricity generator (provider) and a power purchaser (buyer). It typically includes electricity and hot water and is generally used for renewable energy projects.

Financing transport services

Public budgets and financial allocations for transport are limited while being the most important source of income. Cities can seek additional funding and financing options, including through

- **Project-related revenue sources** include public transport fares and the lease of bus advertising space.
- **Transport-related charges** such as fees for paperwork and licensing fees.
- **Extension of the local tax base,** for example, through the introduction of road user charges and parking fees or the use of value capture mechanisms,
- **Engaging the private sector in transport infrastructure development and service provision** can reduce the direct burden on public budgets while enhancing service quality. This requires developing business models to attract private sector investments in the urban transport system.





8

COMMUNICATION

Introduction

Communication is essential for raising awareness, shifting attitudes, building partnerships, attracting funding, and inspiring meaningful action. However, climate change is a complex and challenging subject to communicate. Many local authorities struggle due to limited guidance, resources and widespread misinformation that undermines every effort at the communities' level. Effective communication remains the bridge that connects your climate actions to the citizens they are meant to serve, transforming them into shared goals that are understood, supported, and acted upon.

Completing your Sustainable Energy Access and Climate Action Plan (SEACAP) is a significant achievement. But its success ultimately depends on how effectively it engages civil society, key stakeholders, and local communities. Without that connection, it cannot fulfil its purpose and risks falling short.

Communicating your SEACAP means communicating your climate commitments. It fosters collective ownership of the Plan and inspires action across various sectors of society, enabling cities to transition from planning to implementation. When you communicate your accomplishments effectively, you increase visibility, inspire pride, build trust, and create momentum. This, in turn, attracts new support, unlocks funding opportunities[1] , and amplifies your work's impact, while enhancing your city's credibility and reinforcing your leadership role in the broader climate movement in your region.

It is crucial to communicate proactively about climate change to raise awareness of the issue's urgency and importance, shift attitudes and foster sustainable mindsets. This is not just about informing; it is about engaging people, shaping values, and encouraging long-term behavioural change.

To successfully promote your SEACAP and communicate on climate change, your communication strategy should be rooted in a clear, inspiring vision of your city's future. It must highlight your goals, actions, and achievements in ways that resonate with your audiences and empower participation. It should aim to inform stakeholders, engage communities, and celebrate your city's commitment to sustainability and leadership.

https://www.funbio.org.br/wp-content/uploads/2012/10/Redlac_Ingles_6_COM-CAP-FINAL.pdf

Purpose of this chapter

Local governments have a deep understanding of local challenges and are in a unique position to connect with residents, making them powerful communicators. The local level is where people experience climate change and where tangible actions are implemented. By strengthening local communication capacities, municipalities and local authorities can amplify local voices and attract attention, resources and partnership opportunities.

This chapter provides practical guidance, inspire and support local authorities to communicate effectively and consistently on climate issues. It offers tools and strategies to build a focused and consistent approach to climate communication, including examples, references and real-life case studies that illustrate how other cities and organisations have successfully engaged their communities.

There is no "one-size-fits-all" formula for success. Each city must craft its own narrative reflecting its specific context and community values. The objective is to communicate in ways that resonate with local audiences, recognise their role and establishe a sense of shared purpose. Communication should not only inform but also inspire action and foster inclusion.

Start by reflecting on your city's current context and identifying the most relevant communication objectives. From there, define your audiences, develop key messages, and plan targeted activities that align with your goals. A strategic, customised communication plan will ensure that everyone feels included in the process and your city's efforts are supported and sustained over time.

Following the guidance in this chapter will help you communicate your SEACAP in a way that mobilises your community and reinforces your city's commitment to a sustainable and resilient future.

Advertisers Without Borders http://www.awbnetwork.org/

I- Thinking Strategically:

1. Define the vision of the city and goals of the Plan

Creating a clear and compelling vision for your city is the starting point for developing a SEACAP that aligns with sustainability and climate action. This vision should articulate the desired future for your community, inspirational yet rooted in your city's values, identity, and unique context. A strong vision inspires action, helps prioritise measures, and builds cohesion across policies and projects.

From collective input, the city can craft a concise and inspiring vision statement. For example, a city might declare its ambition to become "A Community for a Lifetime" – a great place to live, learn, work, grow and play, a "city with a sustainable future", a place where sustainability is prioritised, and climate action is embedded in every aspect of life.

- **Creating this vision involves:**

1. **Engaging the entire community:** citizens, local businesses, and key stakeholders so it becomes a shared aspiration.
2. **Including sustainability principles:** such as energy access, emissions reduction, and climate resilience.
3. **Crafting a Vision Statement:** concise, inspiring and reflecting the city's unique identity and aspirations.
   - Example: "Tunis aspires to be a climate-resilient city powered by clean, renewable energy, where every citizen can actively contribute to a sustainable future."
4. **Aligning with the SEACAP:** ensure that the SEACAP becomes a concrete roadmap turning the vision into reality.

1.1 How the Vision shapes the city's future

- A well-articulated vision sets clear goals for sustainability and climate action, outlining what the city hopes to achieve in key areas such as energy efficiency, emissions reductions, and social justice, which are central to the climate action plan and will guide its policies, investments, and community engagement.
- The vision helps bring different actors, including local government officials, civil society, and the private sector, together around a common goal, ensuring everyone is working in the same direction.
- It provides a reference point for how the city grows and develops, encouraging innovative designs in areas such as energy-efficient buildings, green spaces, sustainable mobility and climate-resilient infrastructure.
- By reflecting local priorities and aspirations, the vision becomes a powerful motivator. It not only addresses both mitigation and adaptation challenges but also supports equitable access to clean energy for vulnerable populations, promotes social inclusion and preserves cultural heritage.
- It can help cities attract new talent by integrating innovation and new technologies, especially among young people and entrepreneurs.
- The process of shaping the vision must be inclusive, involve broad public engagement and consultations with citizens, businesses, and experts to understand where the community stands and how to mobilise support for long-term change.

1.2 What you need to do:

- To develop a meaningful vision, start by looking ahead. Imagine what your city could look like, function and feel decades from now.
- Place people and community well-being at the centre:
  - Engage with residents, inform them and create opportunities for active participation.
  - Listen to people's needs and aspirations and encourage them to become part of the solution, not just passive recipients of information.
  - Include opportunities for wealth creators and innovators by promoting green technologies and jobs, and sustainable practices to appeal to educated, ambitious younger generations.
- Keep in mind places, the city's heritage, culture, and environmental assets: celebrate what makes it unique and anchor the vision in these qualities.
- Focus on prosperity, economic development, transportation and infrastructure: encourage the growth of the local economy and ensure everyone has an opportunity to contribute and thrive.
- Envision a future of physical space where cleaner air, green areas, and healthier, sustainable living enhance the quality of life.

The city of Kab Elias-Wadi El Delm, Lebanon

Vision: "A Sustainable Pilot City"

- **Needs:** Kab Elias (75,000 residents) generates 19,162 tons of Municipal Solid Waste annually. Current system uses municipal trucks for collection, manual sorting at landfill, and disposal in a non-sanitary landfill.
- **Opportunities:** Implement smart waste sorting at source and transform community waste management behaviors.
- **Recommendations:** Develop staff capacity and public awareness campaigns, implement household-level waste sorting plans, create integrated waste management strategy to reduce costs and address landfill issues, and deploy waste-to-energy systems for future treatment facilities.

1.3 Key attributes of the Vision

- Identify needs and opportunities:

The vision addresses the current challenges, emphasises the opportunities to answer the needs and highlights the priorities' reco mmendations leading to sustainable actions.

- Create a vision statement/slogan:

It is a short, clear and memorable statement describing the city's desired future state regarding sustainability. It must reflect its values and identity, aspirations, and unique qualities to mobilise people into action.

It should be:

- **Specific,** outlining your core sustainability goals, strategies, and actions.
- **Inspirational,** promoting action and a sense of urgency among local stakeholders.
- **Future-focused,** clearly articulating the desired long-term outcomes (e.g., 100% renewable energy).
- **Inclusive,** taking into account the diversity of community needs.

Example of Vision Statements :

Tunis, Tunisia: "Tunis aspires to be a climate-resilient city powered by clean, renewable energy, where every citizen can actively contribute to a sustainable future. We will embrace green technologies, promote energy efficiency, and adapt to the impacts of climate change while ensuring no one is left behind."

Alexandria, Egypt: "Alexandria aims to be a thriving, sustainable coastal city where renewable energy powers our homes and businesses, and our infrastructure is resilient to the impacts of climate change. Together, we will protect our coastal environment, ensure energy access for all, and create green jobs for the future."

Why the Vision Matters

A strong Vision strengthens communication efforts, helps build consensus, and demonstrates how the SEACAP benefits the whole city while linking strategic planning and daily life.

Keep in mind:

By associating the SEACAP with a meaningful vision of their city's future, citizens are more likely to support its implementation.

Structure your "city of tomorrow" vision around a compelling narrative supported by consistent messages. It can become a rallying point for climate action.

Use a memorable slogan to capture the vision and make it relevant. It transforms technical plans into a story of progress, pride, and purpose.

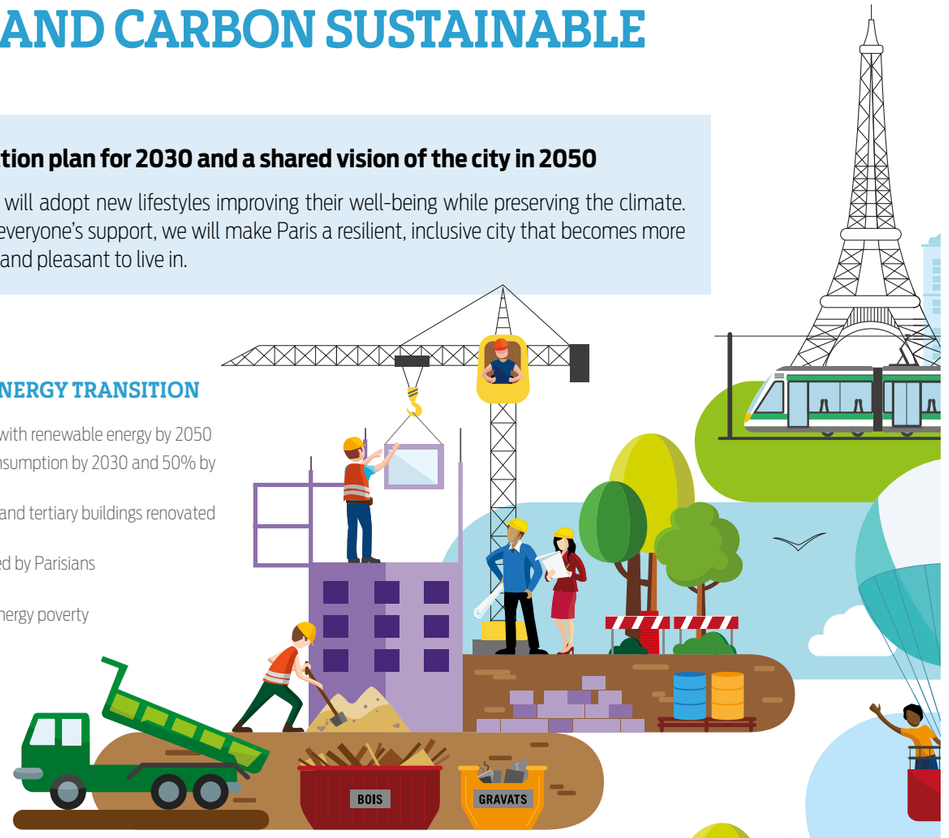
TOWARDS A FAIRER AND MORE EQUITABLE CITY, ENERGY AND CARBON SUSTAINABLE

An ambitious action plan for 2030 and a shared vision of the city in 2050

Tomorrow, Parisians will adopt new lifestyles improving their well-being while preserving the climate. Together, thanks to everyone's support, we will make Paris a resilient, inclusive city that becomes more and more attractive and pleasant to live in.

AN ACCELERATED ENERGY TRANSITION

- 100% of Parisians supplied with renewable energy by 2050
- 35% reduction in energy consumption by 2030 and 50% by 2050*
- More than 1 million housing and tertiary buildings renovated by 2050
- 20% of the energy consumed by Parisians produced locally in 2050
- Stronger solidarity to curb energy poverty



CARBON NEUTRALITY: A SOCIETY PROJECT

- 40% less greenhouse gas emissions by 2030 and 80% by 2050*
- A fair and equitable transition to a low-carbon society, which does not exclude anyone
- A responsible and innovative approach to carbon offsetting
- New professions for a new economic model: energy facilitator and eco-manager.

BETTER AIR QUALITY

- Pure air in 2030: no more coal, fuel oil, diesel or gasoline
- 100% clean, active and shared modes of transport by 2050
- "Paris Respire" Breathing space in all boroughs on Sundays and public holidays by 2024
- Multimodal logistics platforms in the heart of the city for low-carbon freight in 2030

https://cdn.paris.fr/paris/2020/11/23/a10afc931be2124e21e39a1624132724.pdf

2. Set key communication objectives

Once the vision is defined, the next step is to translate it into specific communication objectives. These objectives guide how the city promotes its SEACAP and shape the city's climate messaging.

Your communication objectives should define what you hope to achieve through your communication campaigns such as:

- **Increase Awareness** and knowledge of climate change among residents, its impacts and how it affects their daily lives.
- **Inspire** behavioural change and foster citizens' ownership. Empower citizens, businesses and organisations to collectively support the city's efforts and engage in climate action.
- **Build consensus,** and encourage partnerships with local businesses, community organisations, schools, and the media to amplify the message. Seek broad-based public, private and institutional support for your SEACAP implementation.
- **Deepen understanding** of climate issues beyond the SEACAP itself. This contributes to developing a more ecologically conscious and "eco-responsible" society.
- **Reinforce relationships** with partners and stakeholders, strengthening trust, dialogue, and long-term cooperation.

https://www.plasticfreejuly.org/

3. Conduct an audience analysis and segmentation

Effective communication starts with knowing who you are speaking to. Understanding your audience is central to crafting effective messages effectively and achieving your objectives.

This is especially important given the wide variation in people's awareness, beliefs, and attitudes toward climate change, not only between countries and regions but even within the same city. It is no longer enough just to spread information. The audience must be targeted in the development of content and, messages should be adapted to reflect people's interests, cultural perspectives, and preferred methods of receiving information. The more insight you have into the people you are trying to reach, the more aligned, relevant and impactful your messages and communication will be.

Audience analysis begins with a thorough assessment of the population's willingness to engage with the Plan and its climate-related actions. This includes conducting formal research such as structured surveys or questionnaires, and informal methods like interviews. These tools help uncover what people know, how they feel, and what motivates or prevents them from taking climate action.

A well-executed situation analysis will:

- **Reveal social and demographic characteristics** regarding age, living environment, education, employment, family situation and income. It will assess people's receptiveness, level of awareness and openness to changing habits.
- **Explore environmental values and practices** such as attitudes toward climate action, behaviour and sustainable choices, beliefs and misconceptions on environmental practices and knowledge gaps that need to be addressed.
- **Identify and break down barriers** to behavioural change: whether it be cost, performance and effort expectation, social/peer group influence and social norms, or lack of information. This can help you shape messages that directly address those concerns.
- **Help adopt an awareness-raising strategy** that fits the city's objectives with clearly defined approaches tailored to the characteristics and expectations of the intended audiences.
- **Provide guidance on the design** of communication and awareness-raising materials to be developed. It helps you define what tone to adopt, which content formats to use, what channels are most effective, and how to reach each group in a way that feels relevant to their reality.

3.1 Identify Target Groups:

Climate change should concern everybody as it affects everyone, but in truth, not all groups are equally engaged, and not all face the same level of risk or possess the same potential to drive change. Each group will have different motivations, perceptions, and levels of influence.

Segment your audience into primary groups (and sub-groups) and tailor your communication strategy to the diverse population of the Mediterranean cities. They may include local citizens, women, youth, schools, local business owners, industry representatives, government officials and policymakers.

Other key stakeholders might include environmental NGOs, international organisations, community leaders, religious leaders, farmers, technical experts, opinion shapers, academia, the media, and international donors.

Identifying your specific target group allows you to dig deeper into their true motivations, prioritise communication efforts and tailor content to match their interests and social roles.

@Clima-Med

3.2 Analyse Needs and Interests:

The next step is to explore what each group cares about and values, its level of climate awareness, and motivations for action, and how it perceives climate change to craft relevant and credible messages. In doing this, you create a personal connection that enables people to understand what is at stake and how it connects to their lives.

Identify the situation, goals, drivers, and challenges while being clear about precisely what behaviour you want to change. Ask yourself:

- What challenges do your audiences face
- How do they view climate change, and how does it fit into their daily concerns
- What are their priorities
- What motivates them to act, and what influences they are subject to
- What resources do they have
- Why they may not have engaged in climate-related issues in the past

These insights can be gathered through questionnaires, surveys, or interviews. The findings can help:

- **Describe the population characteristics** like age, gender, socioeconomic status, education level, employment, family situation and income, media consumption habits and preferred communication channels. This will enable communicators to gather resources that address those specific situations.

- **Test audience opinions and awareness levels,** and how they view sustainability in their lives. Assess their knowledge, current attitudes toward environmental issues and practices, and openness to new information and change.

- **Guide the design of communication strategy** and materials, shape messaging, determine what channels to use to convey the information and what tone and imagery are most likely to resonate.

It is essential to define the types of behaviours you want to encourage or change This will help you move beyond awareness-raising to influencing tangible shifts in attitudes and actions and to develop more targeted, effective campaigns.

The profile of each potential target group can be assessed through formal surveys or informal conversations with small but representative samples of individuals. This method can together form a complete picture, allowing you to base your communication efforts on a solid understanding of the people you are trying to reach.

Following the audience analysis, it is necessary to validate your findings through further consultation and dialogue. This means confirming the needs already identified, reaching consensus on key activities to be conducted, allocating necessary resources, and translating these into a coordinated action plan. The goal is to ensure that climate awareness efforts are not isolated events, but part of a long-term, balanced strategy that helps people understand how climate change affects them directly and what they can do about it.

@Clima-Med

4. Analyse the risks, challenges, and opportunities

A well-designed communication strategy should begin with a sharp analysis of the risks, challenges, and opportunities. This involves conducting a comprehensive assessment of potential obstacles and advantages that cour3ld impact your communication strategy.

When promoting a project, it is likely needed to anticipate potential obstacles and identify opportunities for success:

Risks may include message dilution in crowded information environments, climate scepticism within the community, stakeholder misalignment leading to confused messaging, misinformation, crisis amplification through social media, limited financial or human resources, and even institutional inertia. Without acknowledging these barriers, it becomes difficult to plan effective responses or inspire confidence in the Plan's ability to deliver results.

Some identified barriers to change include differing management views, insufficient, inadequate, or conflicting information, doubts over likely success, age and/or health of the individual, lack of government incentives, lack of time and financial resources.

Challenges encompass diverse audience needs requiring multiple communication approaches, language barriers in multicultural communities, civic apathy and information fatigue, limited budgets, bureaucratic delays, and difficulties in measuring the impact of communication. Develop Mitigation Strategies and plan how to address these challenges, such as through education or partnerships.

Opportunities present themselves as new avenues for collaboration through digital transformation, enabling targeted messaging, community partnerships that amplify reach, data analytics providing audience insights, multi-channel integration for seamless experiences, social media engagement for real-time dialogue, mobile-first strategies that reach younger populations, and the potential to convert challenges into relationship-building moments. It is vital to identify and leverage opportunities for collaboration, attract funding, or strengthen public engagement.

Driving factors may involve those drawn from social networks and influencers' support. Therefore, to be better received and provide more influence awareness campaigns should focus on the audience needs and address the community, empower stakeholders with knowledge.

This analysis should inform your communication strategy development, resource allocation, and tactical planning decisions

The SWOT Analysis

To support this analysis, a SWOT framework that examines strengths, weaknesses, opportunities, and threats, provides a systematic approach to understanding your organisation's capabilities and operating environment. Strengths include established networks or past successes; weaknesses may relate to limited reach or technical capacity. Opportunities could arise from increased public interest in climate issues, new digital platforms, or policy shifts, while threats might include misinformation, budget cuts, or opposition from specific groups.

A SWOT analysis can be applied at both organisational and campaign levels, leading to specific, actionable recommendations, that reinforces strengths, addresses weaknesses, capitalises on opportunities, and manages threats proactively.

Understanding risks and opportunities enables strategic thinking that builds resilient, effective communication plans rooted in local reality and aligned with community aspirations. Most importantly, it prepares you to engage people honestly about challenges while maintaining hope about collective action and shared solutions.

This template can help you reflect on the opportunities and threats of climate change, combined with your strengths and weaknesses, and formulate the basis of your climate change strategy.

Strengths
- Established credibility
- Strong partnerships
- Digital infrastructure
- Multilingual capacity
- Previous success

Weaknesses
- Limited budget
- Staff capacity
- Lack of coordination
- Outdated data
- Technical complexity

Opportunities:
- Growing concern
- New partnerships
- Grant funding
- Media interest
- Community events

Threats
- Misinformation
- Economic concerns
- Political opposition
- Competing priorities
- Digital divide

5. Identify priority actions and measures

Once the SEACAP has been developed, you need to identify which projects you want to prioritise and which ones you wish to focus your communication efforts upon.

Priority projects may encompass various sectors, including energy efficiency, transportation, waste and water management, public lighting, agriculture, and climate-resilient infrastructure.

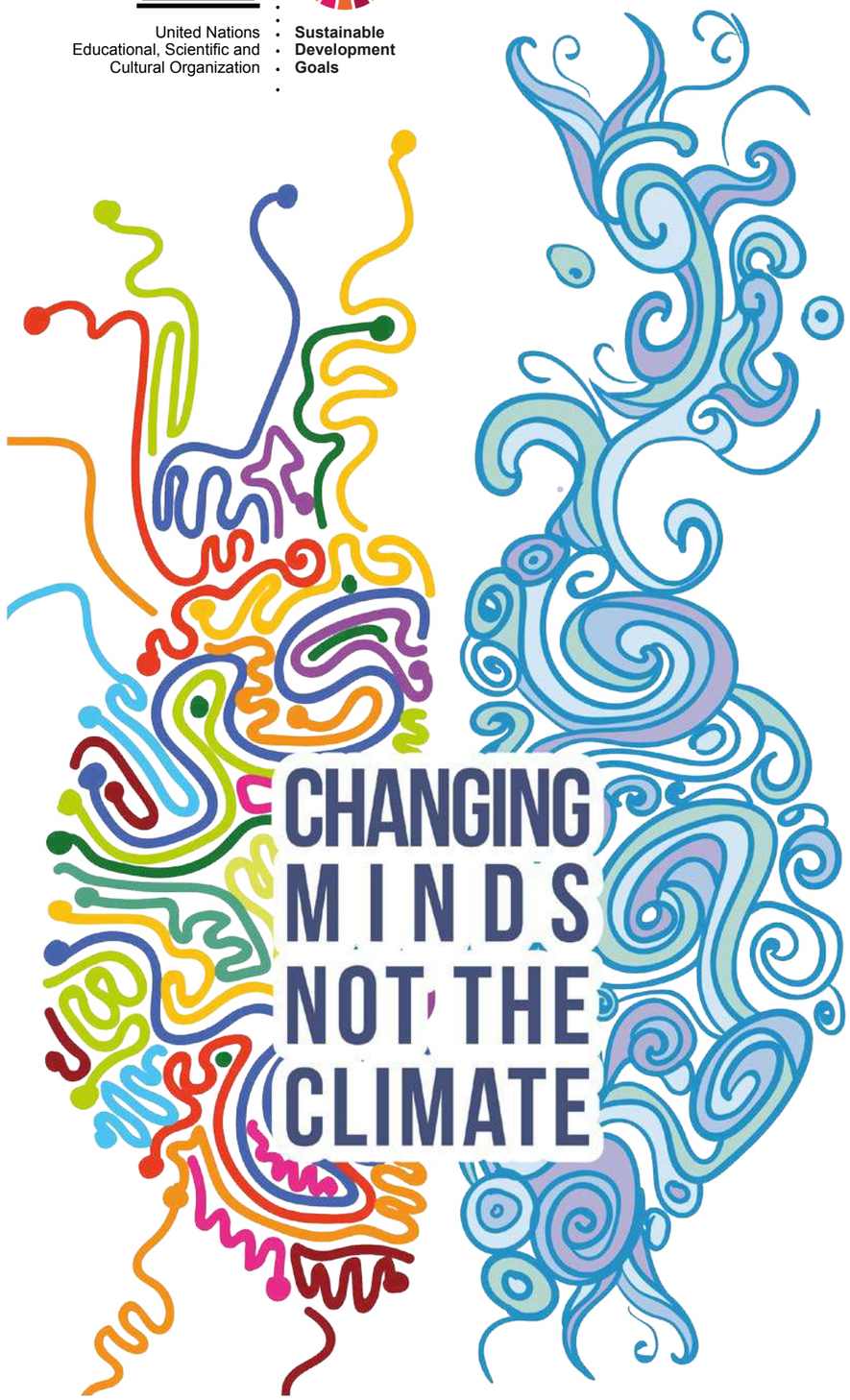
To communicate these projects effectively, the goal of your communication strategy must be to make them meaningful to the people they affect. Tailor your communication to align closely with the community's concerns and articulate the specific benefits they bring to communities, such as cleaner air, reduced energy bills, or improved public spaces.

Some of these priority projects may require high-visibility campaigns, large-scale events or dedicated funding to reach a broad audience. In contrast, others can be successfully communicated out through smaller, low-cost initiatives, mainly when carried out in collaboration with local civil society, youth groups, NGOs or cultural organisations. Many of these partners already work closely with communities and can be more engaging, bringing valuable experience in designing and delivering communication activities at the grassroots level.

You may also find that different partners, such as international financial institutions or banks, are interested to engage with specific projects of the SEACAP. Providing them with these projects as standalone files can facilitate engagement and improve the chances of collaboration or funding.

United Nations Educational, Scientific and Cultural Organization

Sustainable Development Goals



https://unesdoc.unesco.org/ark:/48223/pf0000245977

6. Approach potential collaborations and partnerships

Building a network of partners will mean working and building trust with a wide variety of stakeholders. These partnerships help to extend your reach, amplify your messages, attract funding and provide the support that's necessary to implement your Plan.

It is important to involve both internal and external partners from the beginning. Start by listing organisations, institutions, civil society associations and people who are well-connected to different segments of your community. This should include various municipal departments, local businesses, schools, cultural or religious institutions, and media outlets. Many of these groups can bring credibility, extended networks, as well as skills and resources that can be vital to your outreach campaigns.

One of the most effective ways to engage civil society is through collaboration with NGOs, academics, and public figures who are already actively engaged on climate or environmental issues. They are flexible, cost-effective, and very helpful in identifying participants and reaching audiences effectively, making them powerful champions and ambassadors. For example, forming a Climate Change Committee that brings together local NGOs and associations and engages concerned citizens can help coordinate awareness activities within the wider community and shape climate responses.

At the same time, engage broader segments of the society, including community representatives, business owners, tribal, religious leaders and journalists who can often act as "mediators". Engage with businesses that can champion climate action, promote SEACAP goals as part of their corporate strategies and offer incentives for adopting sustainable practices. Industries should be involved as key partners because of their contribution to emissions and their potential contribution to effective responses.

Encourage existing social or community groups to host challenges or competitions that are both educational and enjoyable. Initiatives like creating Green Space Days, carbon footprint challenges or recycling competitions can make engagement fun and impactful, build social cohesion and turn awareness into action.

Partner with schools and universities that can offer a long-term path for building a climate-aware society. Communication campaigns can include interactive lessons, student-led projects, and awareness activities that involve not only children and youth but also their families, while encouraging them to advocate for action within their families and communities. Empowering young people to serve as advocates for climate action within their schools and neighbourhoods creates a ripple effect spreading the message through personal networks.

Build platforms for citizen engagement where they can contribute their ideas, concerns, and solutions. For instance, a digital platform could allow residents to propose energy-saving ideas or share their experiences with climate resilience.

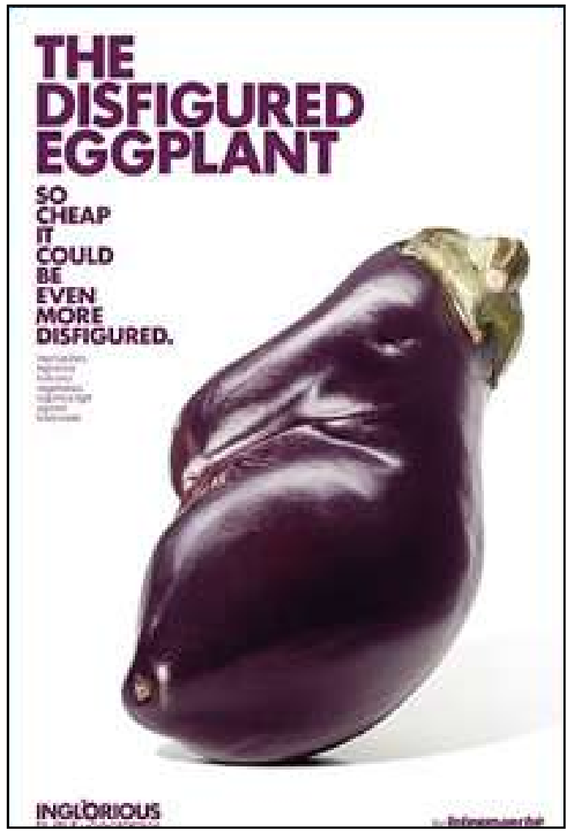
Collaborate with local influencers such as local celebrities, environmental activists, and social media influencers who have large followings and trusted public personas. Their involvement can help spread awareness and create a viral effect.

Community leaders who already have strong ties to local populations can also be appointed as "climate champions" to represent, lead, and inspire their communities. Religious groups' influence should not be overlooked as their views often shape attitudes toward the natural world. By working with religious leaders who see climate care as part of a moral or spiritual duty, the campaign can resonate deeply with values that already guide community life.

https://www.voicesofyouth.org/climatechange_rights

Campaign against food waste

This idea comes from the French campaign promoting “ugly fruits and vegetables” aiming to reduce food waste. It is based on cooperation with local supermarkets through the creation of a legal framework and incentives for food donation and the sale of not perfectly good-looking fruit and vegetables.



https://www.environnement.gov.ma/ar/tous-ecolos-ar?id=369&utm_source=chatgpt.com

Finally, align the SEACAP communication with major global climate events such as Earth Day, UNFCCC COP summits, or World Environment Day to connect your local actions with international movements. This creates a sense of solidarity and expands reach beyond your immediate community.

The United Nations maintains a complete list of international observances that you can find on this link: https://www.un.org/en/observances/international-days-and-weeks).

In summary, collaborating with the right actors at the right time makes your communication more inclusive, credible, and ultimately more effective, allowing you to multiply your impact and ensure your message truly reaches the community.

II- Designing Practically: The Communication and Awareness Raising Campaign

Promoting a city's SEACAP and raising awareness about climate change in a way that resonates with the unique needs and priorities of the region requires tailored strategies grounded in the local context. Achieving impact also requires clear messaging, sustained engagement through diverse communication channels, and a long-term commitment to building trust and understanding among stakeholders.

Climate communication plays a vital role in inspiring voluntary behaviour change, building support for municipal policies, and responding effectively to doubts or resistance. It involves educating, informing, warning, persuading, mobilising, and ultimately solving this urgent global problem. The challenge, therefore, lies in being technically correct, scientifically accurate, and consistent with the latest climate science while making the message clear, accessible and relatable to the general public.

There is no "one-size-fits-all" approach for effective climate communication. Each of the many challenges presents a new opportunity to enhance the presentation of climate change information and the required actions.

The key is to communicate climate change in a way that resonates with and matters the most to your audience. This involves understanding how they perceive climate change, what motivates them to feel personally connected to the issue, and how to frame your message in a way that encourages them to take action.

It's equally important not to overwhelm them with the scale of the problem. With an issue as complex as climate change, people need to know there are practical, achievable solutions to dealing with it, and that they themselves can be part of those solutions.

https://www.instagram.com/hanabi_community/?hl=en

1. Develop an Awareness and Communication Plan:

Strategic communication becomes a powerful lever for action, driving engagement at both individual and institutional levels. Your communication plan functions as the operational proposal that transforms strategy into measurable results, guiding every message, activity, and interaction throughout the implementation of your SEACAP and its related projects.

A robust communication plan addresses five fundamental questions that shape all subsequent activities:

What do you want to accomplish? Clear objectives define success and provide direction for all communication efforts.

Whom are you trying to reach? Specific audience identification ensures targeted, relevant messaging.

What are you going to say? Key messages align with audience values while advancing your climate goals.

How will you reach them? Channel selection maximises impact within resource constraints.

What response do you expect? Defined calls-to-action translate awareness into measurable behaviour change.

Your plan must encompass more than activity lists; it requires a mapping of the implementation timeline, resource allocation, monitoring mechanisms, and provides the structure for adapting your approach as needed. It should also reflect the realities of available budgets and staff capacity, and at the same time remain ambitious enough to inspire real engagement.

Communication objectives anchor your entire strategy and provide evaluation criteria. Using the SMART framework: Specific, Measurable, Achievable, Realistic, and Time- bound, can help ensure your objectives are both actionable and accountable.

Rather than vague aspirations like “raise awareness,” practical objectives specify outcomes such as “increase residential solar installations by 25% within 18 months through targeted homeowner outreach campaigns.”

These objectives address the fundamental question: What problem does your communication strategy solve? Whether combating climate scepticism, inertia, lack of staff, budget constraints, or simply the complexity of the issue, clear objectives guide tactical decisions and resource allocation.

Communication plans developed collaboratively generate stronger community buy-in and reflect diverse priorities. Inclusive planning processes help identify cultural considerations, address potential barriers, and ensure messaging resonates across different population segments. Shared ownership creates resilience that sustains communication efforts through inevitable obstacles. When community stakeholders contribute to plan development, they become invested in its success and serve as authentic messengers within their networks.

Your communication plan must strike a balance between ambition and practicality. It must be feasible, efficient, and adapted to local needs and cultural contexts. This means allocating specific responsibilities, outlining realistic budgets, establishing clear timelines, and identifying measurable success indicators. This ensures that the entire process—from strategy to execution—remains focused, effective, and aligned with broader SEACAP implementation goals.

Effective plans also integrate feedback mechanisms that enable course correction. Regular evaluation against established indicators allows teams to identify successful tactics, address underperforming activities, and adapt messaging based on audience response.

Importantly, this work does not happen in isolation. Many countries and cities worldwide are integrating strategic communication into their climate planning. These efforts offer a wealth of best practices and lessons learned as well as valuable insights into messaging strategies, channel effectiveness, cultural adaptation techniques, and evaluation methodologies. By learning from both regional and international experiences, you can build a communication strategy that is innovative, grounded, and adapted to your city’s reality.

For your convenience, a comprehensive communication plan template follows to guide your planning process.

Communication Plan Template

1. Executive Summary

- Brief overview of your climate communication goals
- Summary of key messages and target audiences
- Expected outcomes and timeline

2. Situation Analysis

Current Climate Context

- Summary of relevant climate science/data for your region or focus area
- Current public awareness and understanding of climate issues
- Policy landscape and regulatory environment

SWOT Analysis

- **Strengths:** Internal capabilities for climate communication
- **Weaknesses:** Internal limitations or gaps
- **Opportunities**: External factors that could aid your communication efforts
- **Threats:** External challenges that might impede your communication efforts

3. Communication Objectives

What do you want to achieve through this communication? (e.g., raise awareness, drive action, inform policy, educate youth)

- Primary objective (What is the main goal of your communication efforts?)
- Secondary objectives (What additional goals will you pursue?)
- Measurable targets (How will you define success?)

4. Target Audience Analysis
Who are you trying to reach? (e.g., local community, policymakers, students, businesses)

For each key audience segment:
- Demographic information
- Current knowledge, attitudes, and behaviors related to climate
- Information needs and preferred communication channels
- Barriers and motivators for engagement
- Influence level and relationship to other stakeholders

5. Key Messages
What are the most important messages you want your audience to understand or act on?

- Core message platform (3-5 main messages that will be consistent across all communications)
- Supporting points for each core message
- Message adaptations for different audience segments
- Framing considerations (e.g., emphasis on health, economic opportunity, justice)

Message Theme	Key Message
Scientific Understanding	
Personal Impact	
Action & Solutions	

6. Tone and Framing
How should your message feel? Choose tone(s):

- Preferred Tone: Urgent , Hopeful , Informative , Empathetic , Empowering
- Framing Approach (e.g., co-benefits, health, justice, economics):

7. Communication Channels and Tactics
Where will you reach your audience? (e.g., social media, workshops, newsletters, radio, school talks)

Digital Channels
- Website content strategy
- Social media plan (platforms, posting frequency, content types)
- Email communications
- Webinars, podcasts, or video content

Traditional Media
- Press releases and media alerts
- Op-eds and contributed articles
- Media interview strategy
- Print materials (brochures, reports, fact sheets)

In-Person Engagement
- Events and presentations
- Community meetings
- Workshops and educational sessions
- Stakeholder engagement opportunities

Channel/Tool	Purpose	Frequency	Responsible Person

8. Partners & Allies

Who can help amplify your message or support your goals?

Partner/Organization	Role or Contribution

9. Visual Identity and Assets

- Climate imagery guidelines and considerations
- Data visualization approach
- Key visual assets needed
- Design guidelines for consistency

10. Implementation Timeline

Key dates and milestones for your communication campaign.

- Phased approach with key milestones
- Content calendar
- Integration with relevant dates (e.g., Earth Day, climate conferences)
- Regular review points

Date/Period	Activity	Notes

11. Budget and Resources

Estimate your communication costs (if applicable).

- Communications budget allocation
- Team member roles and responsibilities
- External partners and their roles
- Required skills and capacity building needs

Item	Cost Estimate

12. Measurement and Evaluation

How will you measure success?

- Key performance indicators (KPIs): Number of people reached, Feedback collected, Media coverage, Event participation, etc.
- Monitoring tools and methodologies
- Reporting schedule and formats
- Process for incorporating feedback and making adjustments

13. Risk Management

- Potential communication risks (e.g., misinformation, opposition)
- Mitigation strategies
- Crisis communication protocols
- Response procedures for common scenarios

Implementation Worksheet	
Priority Actions (First 30 Days)	**Success Metrics**
1.	1.
2.	2.
3.	3.
Key Stakeholders to Engage	**Resource Needs**
1.	1.
2.	2.
3.	
Message Testing Plan	
1.	
2.	
3.	

2. Develop elaborate environmental messages and content

Effectively communicating climate action starts with crafting messages that genuinely connect with specific audiences. Rather than using one-size-fits-all messaging, tailor content to align with specific audiences' values, interests and concerns to make climate action personally relevant and actionable.

To achieve this, it is essential to start by connecting with what matters to your audience. Research consistently shows that people's values and political views often influence their attitudes about climate change more than their level of scientific knowledge. This means connecting climate science to widely shared community values, such as protecting family health, ensuring economic security, or preserving local heritage, makes your message more likely to be heard, understood, and acted upon.

Municipalities play a crucial role in fostering dialogue by ensuring that all stakeholders contribute to the conversation. Reaching out to civil society organisations, neighbourhood groups, youth, local businesses, and underrepresented groups ensures a diverse range of voices in climate planning and action.

Each group of this spectrum requires distinct communication approaches and messages that speak in a language they relate to. Business owners may focus on cost savings and competitive advantages, while families prioritise health and safety benefits. Young people connect with innovation and future opportunities, while community elders may value preserving what they've built for future generations.

https://www.worldwildlife.org/threats/effects-of-climate-change

The following section addresses both the rational and emotional aspects of climate action, creating messages that inform, inspire, and ultimately drive meaningful community engagement in local projects and planning development.

A useful guiding model for climate communication is the "Four E's" approach: Encourage, Enable, Engage, and Exemplify.

1- Encourage offer benefits/praise: Empower stakeholders with the knowledge, skills and confidence they need to participate. It involves highlighting local success stories and progress, acknowledging fresh ideas and positive actions and engendering a sense of local pride. Offering praise, benefits, and incentives, such as community awards or sustainability competitions, opens up space for innovation and motivates continued participation.

2- Enable/make it easy: The first step to behavioural change should be easy and practical. Messages should emphasise short-term gains alongside long-term benefits. Make sure the tools, technologies, and actions are clearly explained and easy to follow. The more beneficial or rewarding an experience is, the more likely it is to be repeated. Offer practical support to those who may feel locked into behaviour patterns, offering a clear path forward.

3- Engage-Get people involved: Create participatory, inclusive opportunities for action: Fun, visible activities, such as school projects, community events, or friendly challenges, can energise people and make involvement feel rewarding. In rural areas, for example, engage farmers, their spouses and families in discussion groups and challenges to promote change in ways that feel familiar, and community led. Engagement is not a one-time act but a continuous relationship-building process.

4- Exemplify: Messages are more powerful when delivered by trusted messengers: utilise community leaders to set by example or choose a likeable local influencer or a relatable public figure to discuss their approaches. Referencing local examples and stories makes the message feel more authentic. Visuals, case studies, and testimonies can help demonstrate that change is not only possible but also already happening around them.

https://www.facebook.com/NamaaInv

2.1 Attitudes can be changed through persuasion and information:

Changing attitudes is possible through two complementary types of messaging: persuasive and informative.

Persuasive messages: They highlight the local and personal impacts of climate change and connect with people on an emotional level. These messages contain motivational incentives at both the individual and community levels, help citizens understand the cost of inaction, offer exciting advice and support and tell engaging stories. Storytelling is a potent powerful persuasive tool. Personal stories make global challenges feel more relatable and human.

"Get free energy from the sun!"

"Less is more"

Informative messages: They offer clear, simple, and evidence-based guidance and explain what needs to be done, why, when, and how using language that is accessible and jargon-free. Be credible, evidence-based and engaging, acknowledge what is behind any barrier to change and demonstrate clear benefits. Effective messages are concise, positive, memorable, and in a concise language, avoiding jargon and adapted to local realities.

"Taking a few simple actions could reduce your energy costs by 10% to 20%"

"Simple home improvements like adding insulation and sealing air leaks can cut your energy bills by 30%. Start with your attic—it's the easiest place to save money and stay comfortable year-round."

Prioritise authentic storytelling

Tell a story, make it real. Most people understand the world through anecdotes and stories, far more than statistics and graphs, so aim for a narrative structure showing the human face behind science when presenting information. Data alone can overwhelm or feel abstract, while stories create connections and bring issues to life. Make your message relevant, local, and personal. By showcasing individual stories, whether families installing solar panels or communities restoring local green spaces, you forge an emotional connection.

Keep it Short and Memorable

A brief, punchy and straightforward slogan reinforces your message far more than a long, complex message. A great slogan should: i) be concise, bold and emotionally resonant, ii) reflect your campaign's mission, iii) deliver your point with impact.

Use slogans that spark curiosity, emotion, or action. Whether they're witty, urgent, or hopeful, the best ones invite your audience to remember and repeat the message.

"Make Earth Cool Again"

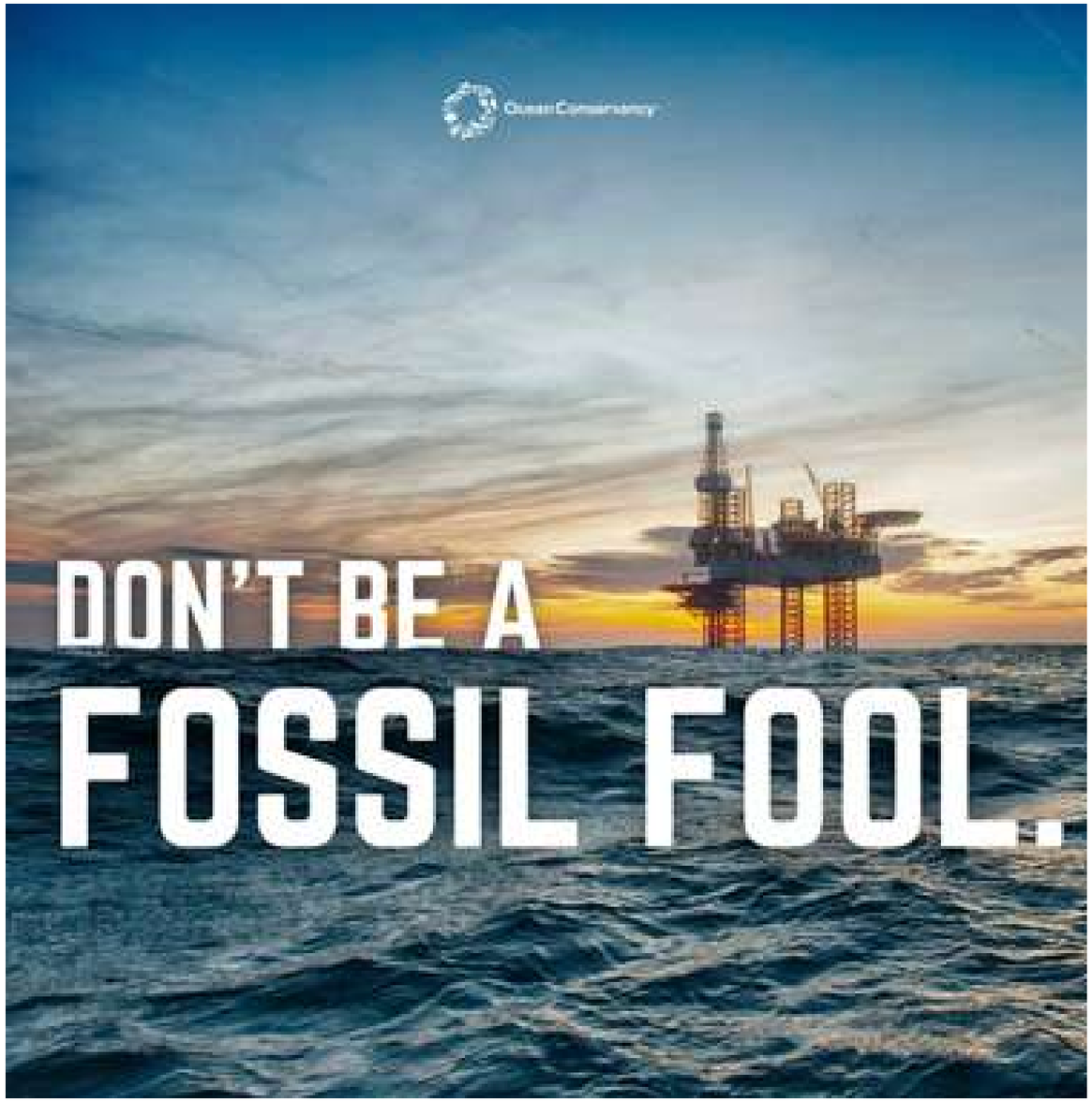
"Green is the New Gold", "Pollution is Not the Solution."

Reflect Your Mission and Values

Your slogan should clearly echo your core campaign's mission and values. Whether your campaign focuses on renewable energy, cutting carbon emissions, or preserving biodiversity and wildlife, make sure your slogan reflects what you stand for to reinforce your purpose while inspiring action.

"Our Mission: Stop Emission!"

"There Is No Planet B".



https://x.com/OurOcean/status/1774854501108773002

Use Action-Oriented, Positive Language

Words have power, especially when they inspire action. A message without any call to action hardly brings about any change. Use language that empowers, motivates and focuses on actions and solutions. Words like “Fight,” “Protect,” “Act”, and “Transform” create a sense of optimism, encouraging people to join the movement and believe their actions matter.

“Protect, baby, protect—our planet, our future.”

“Keep Calm and Go Green”

“Act Now for Tomorrow.”

A positive tone is equally important, as action-oriented language inspires change. Rather than dwelling solely on problems, messages should focus on resilience and hope, showing people’s strength, not just their struggle.

Words like “Protect,” “Act,” “Transform,” and “Create” convey action and optimism. Slogans such as the ones below reinforce a belief that solutions exist, and that people have a role to play in building them.

“Be the Energy for Change.”

“Hope Is Renewable, so is Energy”

Appeal to Emotions

Emotion is one of the most powerful drivers in communication. It’s key to use a narrative that appeals to the feelings of people; it will help make the language more persuasive. Messages that evoke feelings of concern, pride, joy, hope, urgency or even anger can effectively move people, making the climate message more deeply felt and memorable.

“Hug Trees, Not Plastic!”

“We’re picking up the planet; Join the clean-up!”

“Our Children Deserve Clean Air.”

“Love the Earth Like It’s Your Home—Because It Is.”

Finally, messages must strike the right balance between urgency and hope to inspire immediate, actionable solutions without leading to despair. Your messages should convey the gravity of the moment while keeping the door open to positive change and the belief that solutions are within reach.

“What is more important than good and clean air?”

“Voices Rising, Temperatures Falling.”

“Hope Is Renewable—So Is Energy.”

Use effective visual communication

Visual communication is equally important. Just as verbal and written communication, the strategic use of images, infographics, and videos can significantly amplify your message and help audiences connect with the topic quickly

Using different types of impactful visual messages summarise the cause and consequences of and solutions to climate change can help grab attention and elevate the experience of the viewers.

https://www.unesco.org/en/articles/unesco-declares-environmental-education-must-be-core-curriculum-component-2025-0

2.2 Tailored Messages for Different Key Audiences:

It is essential to know your audience and tailor messages that resonate with each groups' values and concerns. As climate change is a global issue with far-reaching impacts, communication must be inclusive and relevant to diverse groups, including residents, partners, opinion leaders, and key stakeholders.

- **Youth and Schools:**

Young people today are increasingly eager to create positive change in the world. As they are curious about how climate change might impact their lives[2] , they should be given the space, support and rights to contribute meaningfully to climate-related actions. By empowering young people to participate in climate action, we can harness their energy and fresh perspectives to drive genuine environmental transformation. After all, today's decisions will define their tomorrow.

Encouraging youth involvement through creative educational programs, environmental school clubs, and local initiatives, such as the Scouts helps foster awareness and build lifelong skills.

Early education on how to respect and protect the environment doesn't just prepare children for their future as adults; it also encourages intergenerational learning where children influence the behaviour of parents and communities.

Teachers and schools should also be equipped with the tools and guidance to integrate sustainability into curricula and motivate participation in hands-on environmental activities. Allow academic institutions to become more involved in implementing informed collective awareness actions and promote them. This close exchange between science, society, and politics enables young people not just to observe but to shape their future.

"You don't have to be a grown up to make a difference".

"You have the power to make the difference, to make change happen and play your part for climate action, good health, and well-being of your planet".

"It's your future, are you willing to stand up for change and act now?"

"The future is in your hands! By learning about renewable energy, reducing waste, and taking climate action, you can help build a sustainable city for tomorrow."

"It's your planet. Your health. Your turn to act."

2 https://www.washingtonpost.com/science/most-american-teens-are-frightened-by-climate-change-poll-finds-and-about-1-in-4-are-taking-action/2019/09/15/1936da1c-d639-11e9-9610-fb56c5522e1c_story.html
https://www.voicesofyouth.org/climatechange_rights
https://www.etsy.com/listing/647508984/the-eco-friendly-alphabet

- **General Public:**

Civil society actors play a key role in advancing the development backdrop, delivering social services and implementing development programs, especially in regions where the governments capacity may be limited. These actors amplify the voices of communities, including consumers, workers, and farmers, advocate for justice, and raise awareness about climate challenges. Through their active participation, they help shape public interests and influence climate policy.

Messages directed to the public should be inclusive, accessible, and inspiring. Highlight local realities: from heatwaves to flooding, use stories that connect climate action with everyday life.

"Climate change affects us all. From rising temperatures to water shortages, it's time to act. Through SEACAPs, we're building a cleaner, safer, and more affordable future for everyone."

"Our children deserve clean air, green spaces, and a stable climate."

"Small actions, big impact—turn off, recycle, ride clean."

- **Business Community:**

Local businesses, from farmers and tourism operators to small enterprises, are the essential driving force behind regional economic resilience. They are uniquely positioned to serve as climate ambassadors, raising awareness among residents and visitors alike. Their priorities are often centred on business prosperity, sustainable tourism, and a thriving local economy.

Communications targeting this audience should highlight the business case for sustainability, emphasising that adopting green practices can reduce costs, enhance reputation, and secure long-term prosperity. Encourage partnerships with local tourism boards, tour operators, local associations and land-user platforms to integrate sustainable practices into daily operations. Farmers should also be included in dialogue platforms on land use and regulation to ensure they are active participants in shaping sustainable practices.

Finally, celebrate local production and create pride in "Made in (My City)" products to strengthen both community identity and the market appeal of regional goods.

"Green businesses are the future. Lower your costs, raise your impact and improve your reputation."

"Made in (city) with love".

"Grow green, eat clean".

"Nature's way, every day".

"From soil to soul, farming for a better tomorrow."

"Sow seeds of sustainability. Cultivate a better tomorrow".

"Nourish the planet, nourish yourself".

https://www.behance.net/

- **Vulnerable Communities:**

Climate change disproportionately affects the most vulnerable. The communication must address issues of justice and equity, ensuring that all citizens, especially those at risk and those residing in rural or low-income areas, have access to affordable clean energy and are protected from climate-related impacts.

"Your Land, Your Future: Climate Solutions That Work for Rural Life"
"Affordable Clean Energy for Everyone"
"Safe, Comfortable, Connected: Climate Protection for All".

- **Policymakers and Local Government:**

These audiences are key to implementing change at scale. Communications should focus on the long-term benefits of SEACAP implementation, including economic resilience, job creation, and improved public health. Effective messaging addressed to them should emphasise strategic foresight, cost-effectiveness, and the well-being of citizens.

"Climate action isn't just about the environment—it's about protecting the city's future. SEACAPs help anticipate and prepare for climate risks before they become costly crises, ensuring our community remains resilient and competitive."

"The SEACAP is our city's roadmap for a sustainable, resilient future. By supporting policies that encourage renewable energy, energy efficiency, and climate adaptation, we will protect our economy and the well-being of our citizens."

- **Community leaders**

Local leaders are trusted voices within their communities, uniquely positioned to inspire participation and secure critical support for climate action. They are often motivated by their commitment to serving the public, achieving impact during their term, and driving progress in line with current trends. Engage them with meaningful roles in planning processes and decision-making. Appeal to their sense of impact and legacy by showing how climate-related actions can promote local development, cohesion, and prosperity.

Highlighting success stories from other cities can foster confidence and ambition.

"Power Your Community with Sustainable Change."
"Govern for Growth. Lead for the Planet."
"Your Voice Can Change the Climate Story."

https://x.com/cmneedles

3. Choose the right communication channels

Effective communication planning begins with a comprehensive channel assessment. Start by identifying available local media and information channels, such as radio and TV networks, billboards, notice boards, marketplace information points, your city's social media accounts, official website, and partners' distribution networks, to extend your reach.

Each channel targets specific audiences in ways that cater to their communication preferences and serves distinct purposes. Channel selection should be guided by key factors: cost-efficiency, media coverage and access, cultural considerations, long-term sustainability, and message repetition needs and depends on your given audience, message, timing, and context.

The key to maximum impact is integrating multiple channels to reinforce messages. Combine traditional media, digital platforms, and community engagement strategies to create a comprehensive communication approach that effectively reaches a broad spectrum of audiences.

Use varied communication tools such as videos, podcasts, infographics, newsletters, and webinars to engage different groups, including youth, women, businesses, and civil society. Your integrated strategy should deliver messages through advertising, public relations, direct marketing, and social media.

Enhance outreach by incorporating endorsements from local celebrities, influencers, and community leaders, leveraging their credibility to amplify your climate action messages.

3.1. Traditional Media:

Traditional media such as newspapers, radio, public participation forums, billboards, and television offer broad reach. They are effective for communicating with large audiences quickly, each serving distinct purposes and reaching different audience segments.

To engage the citizens' interest, start by assessing which local media and information channels you have access to, and think about the actual and preferred channels your target audiences might use and whether you plan to use the right ones for maximum impact. You must make sure citizens have an adequate opportunity to learn about projects affecting their lives through the choice of the most appropriate communication channels (i.e., the most accessible and the easiest to implement and finance) for each target group.

It is also essential to consider whether your city operates social media accounts or an official website, and if you can utilise partners' distribution networks to extend your reach. Moreover, attracting media attention also plays a vital role in amplifying your message.

A wide array of communication and dissemination tools is available for implementing your awareness activities. These include face-to-face meetings, networking, advertising, mail and email, internet and social media, blogs, public talks, films, brochures, posters, newsletters, press releases, newspaper articles, public relations efforts, sponsorships, broadcast media such as TV and radio spots, educational materials, high-impact events, factsheets, promotional items, contests, and capacity-building workshops.

However, mere information sharing rarely results in behavioural changes. To encourage new behaviours, information materials should be supplemented with actions and events such as exhibitions, public meetings, demonstrations, site visits, citizen juries, teleconferences, surveys and questionnaires, media events and press conferences, social events (like screenings, concerts, plays, etc.), discussion groups, forums, and open houses.

Public awareness campaigns typically aim for early, visible results through media outreach and stakeholder engagement. However, for more profound and lasting changes, especially among young people, awareness should be paired with education programs delivered through formal methods and settings to transmit a more substantial understanding of climate challenges and potential solutions, and to train technical and municipal staff. Broad involvement in policy shaping and climate program implementation significantly enhances effective action.

Allocating dedicated personnel to manage public engagement is essential. If staffing or resources are limited, consider seeking support from volunteers or trusted partner organisations.

An awareness-raising activities on World Water Day on 22 March 2024, 'Voice of future generations'-Arab Institute for Human Rights (IADH) and the association Réseau Enfant de la Terre (RET).

3.2. Digital Media:

Digital media channels such as social media platforms, websites, and email allow for targeted communication and real-time engagement with audiences. The platforms offer enormous potential to share visual stories widely and creatively. They enable users to exchange information and allow people to network, facilitating exchanges between multiple groups, creating an exchange of experiences, information and ideas, and forming a network community that promotes cooperation among users.

Social media: A strategic challenge

Social media's power is undeniable: more than half of the global population uses social networks, offering unprecedented reach[3] . By simply hitting 'post', a person or brand can connect with countless audience groups (i.e., individuals, businesses, peer and competitor brands, organisations, governments, etc.).

To fully exploit this strategic potential, you need to develop a coherent social media strategy aligned with your overall objectives. This includes defining campaign goals, identifying target audiences such as decision-makers and influencers, crafting key messages, scheduling posts for optimal engagement times, selecting the most effective media to influence your audience, and continuously evaluating campaign performance to improve future efforts.

A continuous presence enables precise audience segmentation, optimised marketing spends, rapid crisis response, community creation, and real-time strategy adjustments.

Allocating dedicated personnel to manage public engagement is essential, especially for social media. It allows you to remain agile and responsive in the face of rapid changes in the digital landscape.

The main objectives of a social media marketing strategy are:

- Develop your visibility and reputation on social networks
- Grow the community of subscribers
- Increase users' engagement and interaction (likes, comments, views, etc.).
- Increase users' satisfaction and positive perception among followers
- Create leads with subscribers, generate prospects to enrich the database

https://www.facebook.com/plantfortheplanet

3 https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/)

A social media campaign should include:

- The objective of the campaign, what does a campaign win look like? (Why)
- The target audience: demographics of decision makers, amplifiers, influencers, etc. (Who)
- Key messages and content creation (What)
- Scheduling of posts, best time in the day, best day in the week, time zones (When)
- Most effective quantitative and qualitative evaluation of what worked and what didn't for a better campaign in the future (How).

Generating good content on social networks requires a plan that:

- Aligns with a broader marketing strategy
- Ensures consistency between messages across all channels
- Covers multiple formats, including videos, blogs, e-books, videos and platform-specific stories.
- Tailor captions according to each social network platform and encourage interaction from followers, as you can ask them to leave comments or 'Shout out'.

Sharing simplified scientific information, highlighting concrete solutions, and positive initiatives will make messages more accessible and inspiring. Online press conferences can also effectively engage global media by providing focused talking points and quotes.

The Social media engagement

Community engagement on social media is the process of involving those who live and influence your city's development, including anyone with an interest in or influence on, or who is impacted by, a local plan, policy, or action.

Engagement strategies help cities foster better working relationships with the community, ensuring that all parties' needs and voices are understood and can be addressed to achieve positive change.

WWF Snaps #Lastselfie of Endangered Animals

Optimising content to boost social searching

Given that users increasingly search within social networks rather than traditional search engines, optimising your profiles and posts for visibility is crucial.

- **Identify your targets:** Effective communication requires a deep understanding of your audience's needs and motivations to deliver personalised, relevant messages at the right time.
- **Maximise the impact of keywords and hashtags:** Carefully selected keywords and hashtags tailored to each social network enhance discoverability. But overuse of hashtags can reduce attention and relevance of your publication. Tagging places also helps increase exposure within local content feeds.
- **Share short-form content:** With so much content published on the web every day, short-form content such as videos, infographics, and ephemeral stories is becoming increasingly popular. It's easier and faster to consume, especially on mobile devices.
- **Use appealing visuals:** posts that maintain consistent colour palettes and include multimedia elements capture attention more effectively.
- **Include calls to action:** Publications should use clear, concise language and include calls to action encouraging ecological challenges and directing audiences to additional resources.

Social media objectives are not fixed:

Regular review and adjustment based on the results you have achieved are vital.

Prepare content in advance for predictable events but remain flexible to respond to unexpected developments.

Assign dedicated personnel to manage social media during campaigns or events.

Maintain a strategic and reactive approach by adapting strategies to maximise engagement and impact.

Be mindful of misinformation, which often stems from unintentional errors or misunderstandings, and disinformation, which intentionally spreads false information, such as greenwashing, to undermine climate science and policies.

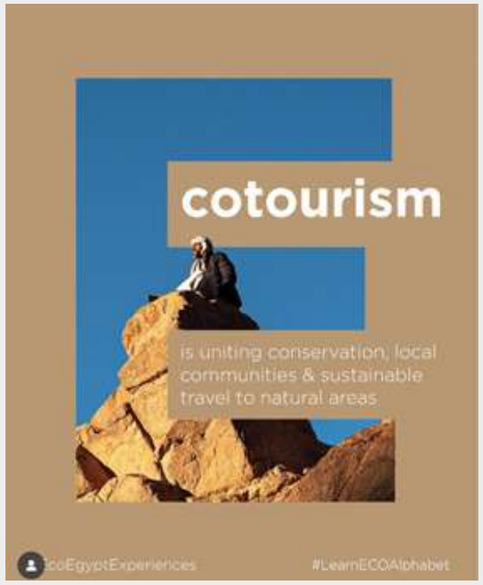
3.3. Community Engagement:

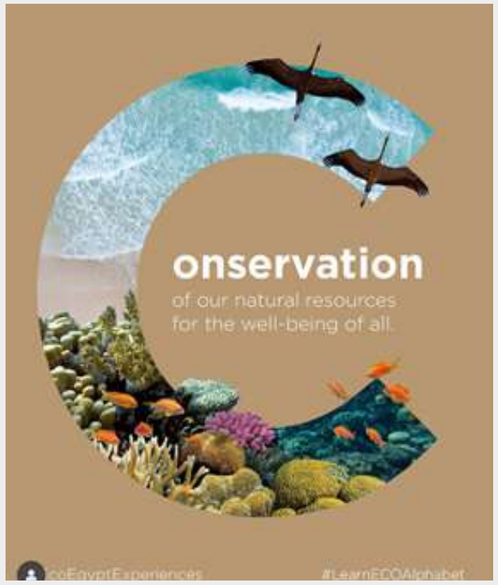
Direct engagement through events, workshops, public consultations, and interactive activities builds trust and fosters deeper community involvement. These opportunities promote dialogue, gather valuable feedback, and encourage community ownership of climate initiatives.

3.4. Allocate Resources:

Ensure you have the necessary staff, budget, and tools to implement the campaign. Proper resource allocation is key to effective planning, execution, and follow-up.

Selecting communication channels that align with your audience is crucial to success. By combining traditional media, digital platforms, and direct community engagement, you create a robust communication strategy. Clear goals, consistent messaging, adequate resources, and ongoing monitoring and adaptation will help your campaigns achieve lasting impact.





Green tourism

It can be promoted by organising local fairs and festivals. Local recreational attractions can be created in collaboration with private business, which can be tailored as a win-win cooperation. For example, the creation of sports facilities as part of a project developed by a city would create an opportunity for profit for a private business if it is in possession of sports tools rental activity, animation or entertainment facilities within the recreational park.

https://www.instagram.com/eco-egyptexperiences/p/Co96g9FtE-_/

4. Implement the awareness campaign:

Once you have selected the communication tools and completed the planning phase, you can begin designing and implementing the awareness campaign. This stage requires specifying the campaign's objectives, defining detailed target groups, crafting key messages, and developing engaging content.

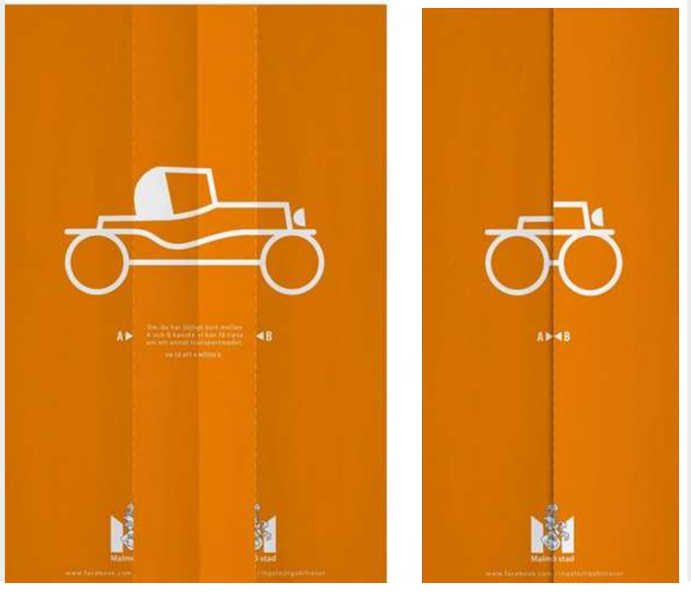
The first part of this process is communicating and embedding your sustainability vision throughout your organisation and beyond. You can utilise various channels and formats, including your website, social media, newsletters, reports, events, or dedicated campaigns, to reach both internal and external audiences. Moreover, your vision should serve as a foundation for your sustainability policies, programs, and initiatives to ensure consistency and integration.

Successful implementation requires coordinated efforts among all stakeholders and maintaining open channels of communication with non-government actors in civil society and the private sector. In many cases, this will involve persuading stakeholders of the benefits of taking early action.

Awareness campaigns should be simple, emotional, and use language that is understandable to reach a broad audience, as public participation is key to achieving significant change across cities. Campaigns must establish their own identity, tone, and creative look and feel to be recognisable and memorable.

When designing your campaign, several tactical elements are essential:

- Create a common visual identity by designing a campaign logo that will reflect your values and principles. The logo will be used across all your communication channels and promotional materials, helping to create consistency and recognition.
- Develop a creative theme or 'big idea' that will capture your audience's attention and encourage their engagement.
- Use graphically appealing materials with real photos of real people to make campaigns relatable and trustworthy. Stand out with eye-catching infographics that bring data to life, clean and airy designs for attractiveness, and easy to read fonts for better readability.
- Make your content coherent and consistent, repeat familiar structures, colour schemes, and images and infographics style. Well-organised content will keep your reader engaged.



City of Malmö: Sustainable transport, Sustainable city · Ads of the World™ | Part of The Clio Network

Alex Nabaum Earth Day

Because every city has its own issues, culture, and priorities, it is important to reflect these in your communications:

- Images work, so visualise your message with graphics, icons, or photographs to effectively summarise your campaign messages.
- Incorporate testimonials or human-interest stories featuring real people, ambassadors, or local heroes to add depth and give a human voice to your campaign.
- Adopt an upbeat, light and feel-good tone with humour and illustrations to make your messages more inviting.
- Tap into data if you have some big numbers or killer facts and use them to captivate your audience.
- Build interactive spaces where people can share their views to give the campaign a human dimension and enhance connection.
- Make it attractive with a catchy slogan to boost the campaign's appeal.

If you're hosting an event, this involves excellent planning, management, and evaluation. To make it successful, choose an appealing event name, a concept, a slogan, or a hashtag that fits your overall awareness campaign messaging and connects with its look and feel.

Large events can reach bigger audiences, create impact, attract media attention, raise visibility, present a wide range of topics, and feature renowned experts. Smaller events are more effective in fostering closer connections and stronger community bonds.

Don't forget to promote your event well in advance through formal invitations, "save the date" notes and other reminders.

Climate Change Art Exhibitions

Exhibitions, such as Olafur Eliasson's "Ice Watch," displayed powerful and striking visual installations of melting ice blocks in public spaces to create visual reminder of the effects of global warming and highlight climate change's impact.

These art pieces evoked emotional responses and sparked conversations about the urgent need for climate action.

Such exhibitions also serve as a platform for artists to express their concerns and visions for a sustainable future. They emphasize the importance of visual storytelling in raising awareness and driving action on environmental issues.

https://ichigobloom.jp/thinking-outside-the-box-5-unconventional-ways-to-raise-climate-awareness/

Some rules and recommendations to ensure professionalism and effectiveness in your materials:

- Always include key visibility elements such as the project name, logos (project, programme, partner, donor), co-financing statements, and the disclaimer (where applicable).
- Use high-quality vector images for professional design purposes and consult professional designers whenever possible.
- Limit fonts to one type per publication to maintain clarity and consistency.
- Illustrate your materials with appropriate photos rather than clip art images.

Make climate change vivid through visual imagery and experiential scenarios. Storytelling is one of the most important tools we have to show climate change is happening and we can do something about it.

Stories are how we make sense of the world we live in and help us to share facts, knowledge and experiences about the causes and effects of climate change .

5. Measure and assess campaign success

Throughout the implementation, you must monitor the impacts and evaluate your progress, reporting on both achievements and results of the campaign to make improvements. The monitoring and evaluation step must be integrated into the planning phase, especially when targeting behavioural change.

Once the message has been communicated to the audience after a campaign phase, monitoring and evaluating the communication and awareness actions is the next important step. This involves monitoring and evaluating both quantitative and qualitative data on how well activities are performed and the impact they achieved. It also examines increased awareness, pride, and the willingness to get involved.

The only way to know if your communication work is delivering results is by actually trying your planned activities and then assessing their success. When evaluating, consider what is working well, what is not, what needs changing, and what should remain the same.

You may not be able to determine precisely how much each communication activity has contributed to your success, but an overall measurement will guide you in focusing resources and activities where they are most effective. Reviewing and adapting your plan based on evaluation is a natural and necessary step.

The key questions to be asked are: Has the message been heard/understood/acted upon?

Although there might not be harmonised universal methods for measuring behavioural impacts, the current challenge is to develop better evaluation techniques and establish meaningful indicators, such as a headcount at a seminar, follow-up interviews, quantitative/qualitative surveys, video views on YouTube, hits on the website, social media interactions, feedback via e-mails, press clippings, etc.

This evaluation allows you to measure progress, identify gaps, refine your strategy and improve your campaign as you go along. It is essential to collect data systematically, conduct thorough evaluations, report results, and share findings to better achieve desired outcomes.

Track metrics on Public Engagement: Establish indicators such as a headcount at a seminar, quantitative/qualitative surveys, video views on YouTube, hits on the website, social media interactions, feedback via e-mails, press clippings, etc.

Track metrics on Behavioural Change: Behavioural changes can be tracked by observing reductions in household energy consumption, increases in public transport use, and other sustainability indicators.

Feedback mechanisms, such as surveys, polls, and focus groups with different population segments, including youth, businesses, and vulnerable groups provide deeper insights into perceptions of climate action[4].

A social campaign promoted by WWF about the effects of global warming

The qualitative evaluation needs to be made at three levels:

- **Increased awareness:**

Conduct a survey with stakeholders before, during, and after a campaign to assesse the shift in awareness over time. For example, if launching an awareness campaign to help residents understand the value of the biosphere reserve, conducting a street poll with a sample of residents that includes questions on their level of understanding of what a biosphere reserve is, might indicate the change in the level of awareness.

- **Increased pride:**

Asking your citizens about what they value most about their city and how they feel about living there. Point towards their feeling of belonging and their level of satisfaction.

- **Increased willingness to get involved:**

Asking stakeholders how likely they want to get involved in your actions or what more they might need are good ways to measure their willingness to engage.

The quantitative evaluation should measure:

- **Reach:**

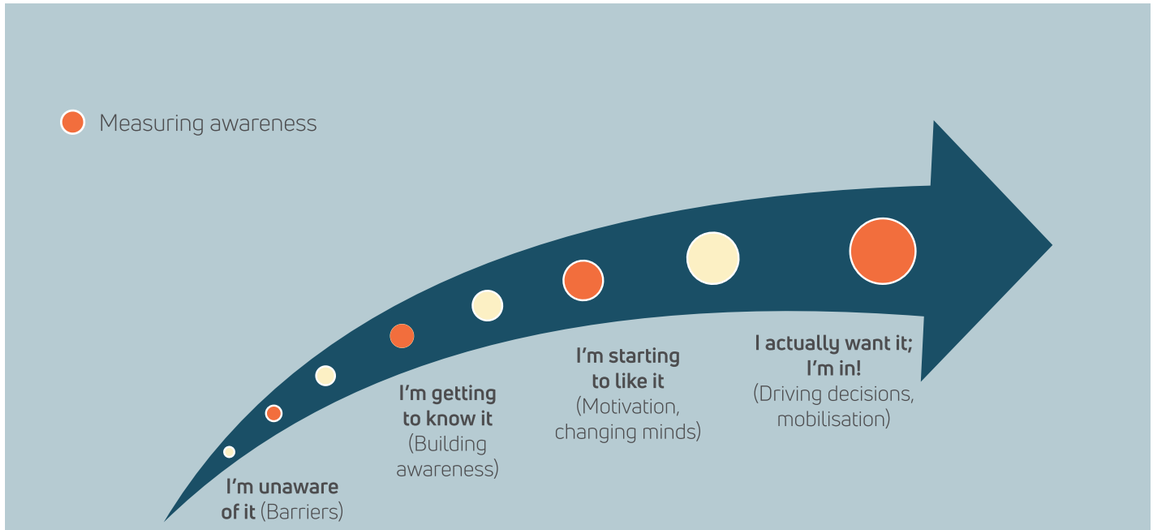
Determines the number of people directly targeted by your communication and the number of people indirectly contacted by your communications.

- **Impact:**

Assesses the increase in awareness and changes in the behaviour and the increased willingness of people to get involved in the action.

- **Investment:**

Accounts for the funds provided for the awareness activity



Awareness Process: Building levels of awareness leading to a change in attitude

There are six key drivers of change to consider:

- Finances, profitability and income.
- The behaviour and attitudes of social groups and networks.
- Sources and distribution of information
- Incentives and external pressures including subsidies, regulations, and awards
- Personal motivations, including environmental concerns.
- Market drivers, like market access based on sustainability credentials or environmental certification.

Common challenges and strategic recommendations

- **Inspiring and engaging end-consumers**

End-consumers often struggle to grasp how climate-related information is conveyed and how it is connected to their daily lives. Traditional messaging, like saving money or saving the planet, hasn't always fully succeeded. To foster engagement, people need to feel inspired, emotionally connected, and find enjoyment in the message being communicated.

- **Countering misinformation and building trust**

Combat climate scepticism and false information by sharing credible evidence and science-based information. Use trusted partners and messengers to spread accurate information and enhance trustworthiness.

- **Ensuring repetition and multi-channel exposure**

Repetition and multi-channel exposure to key messages are also crucial. Key messages need to be repeatedly communicated across diverse platforms to remain fresh and relevant in the minds of target groups. Expand and adapt the campaign regularly to keep the content engaging and ensure continued attention.

- **Strengthen Institutional Coordination**

Enhance collaboration among municipal departments through clear internal communication channels to improve campaign effectiveness. Consider establishing a dedicated communication unit within the local authority department to streamline and coordinate cooperation between services and stakeholders, thereby reducing overlap and improving consistency.

- **Integrate Gender-Sensitive Approaches**

Understand gender differences in consumer behaviour by integrating behavioural insights and updated surveys on sustainability attitudes. Recognise gender roles, perceptions, beliefs and preferences in climate actions, considering women's greater exposure to environmental stress factors[5]. Mainstreaming gender equality in environmental strategies is key to achieving fairer and more sustainable development[6] .

- **Promote Individual and Community Engagement**

Promote individual actions and citizen-led initiatives to strengthen emotional resonance and involvement. Volunteering actions can be powerful drivers by facilitating experiential engagement through real-life stories.

- **Lead with Public Authority and Clear Messaging**

Public authorities should take a leading role in communication efforts to inform citizens, raise awareness, shift perceptions and behaviours, and legitimise the implementation of public policies, turning principles into practice[7] .

- **Tailor Messages Using Behavioural Insights**

Tailoring messages using behavioural insights allows campaigns to shift consumption habits successfully. By crafting targeted messages for different social groups that address their specific values, concerns, and motivations, campaigns can better engage media and citizens, support sustainable choices and foster a sustainable economy.

Undertake tree planting initiatives

Planting initiatives raise awareness in citizens on the environmental issues and motivate to take actions for its preservation. Planting in nearest forests called reforestation, helps in avoiding climate changes by reducing the effects of carbon offsets, increasing air quality, maintaining the local temperature balanced and many more. If we plant 20 million trees, the earth will get with 260 million more tons of oxygen.

5 Sorensen et al., 2018 [17]
6 Gender and the Environment; Building Evidence and Policies to Achieve the SDGs
7 R. Debray 1993; C. Ollivier-Yaniv 2000

- **Maintain Ongoing Dialogue with the Public**

Establish regular public consultations and maintain ongoing dialogue with the citizens to inform them about local projects affecting them and to encourage their active involvement.

- **Translate Scientific Knowledge into Accessible Formats**

Scientific information about climate change is essential, but technical language can be a barrier to understanding. Translating scientific knowledge and climate science into more accessible and entertaining formats, through storytelling and visual content, helps reach a non-scientific audience effectively.

- **Use Visuals to Evoke Action, Without Fear Mongering**

Dramatic visual portrayals of climate change can be persuasive, but emphasising fear is not always necessary to create urgency and a response; balanced messages that inspire hope tend to be more effective on the long term.

- **Coordinate and Avoid Duplication**

Before launching new initiatives, assess existing efforts to avoid duplication of actions. If there are parallel initiatives already in process, collaborate on unified efforts to make the most of resources and broaden the campaign's reach.

- **Plan for Long-Term Awareness Building**

Awareness-raising and behavioural change take time. Successful awareness campaigns require long-term efforts, with consistent, positive messaging repeated over several years to build lasting impact.

- **Highlight Real-Life Stories and Challenges**

Showcase real-life stories and challenges of individuals and communities addressing climate issues, which include their struggles, setbacks, and successes. Those stories are often far more effective than abstract, issue-based communication.

- **Maximise Impact on Limited Budgets**

Working with limited financial resources is a common challenge and can be a constraint. It is important to build partnerships with NGOs, businesses, and volunteers to share costs. Leverage low-cost platforms such as social media and community events to help stretch resources and increase impact.

Immersive environmental science

Time spent in nature is strongly correlated with holding pro-environmental attitudes and behaviors.

Conclusion

Effective climate communication is essential for the success of your SEACAP. By following this step-by-step guideline, you can develop a communication strategy that resonates with your audience, fosters collaboration, and inspires action. Remember, the key to success is to tailor your approach to the unique needs and circumstances of your city and its residents.

Communication stands at the heart of every successful climate initiative, serving as the vital thread that weaves together scientific knowledge, policy decisions, community action, and individual behaviour change. It is fundamentally about relationships: between science and society, between institutions and citizens, between present challenges and future possibilities.

Effective communication about climate challenges and solutions is more than sharing information; it is about building understanding, fostering trust, and creating the social cohesion necessary for transformative action. It is about making genuine dialogue that respects diverse perspectives, acknowledges different lived experiences, and builds on shared values.

Authentic and empathetic communication creates space for meaningful engagement that transcends political divides and cultural barriers. In a world where climate change affects every community differently, communication becomes the bridge that connects local experiences to global solutions, turning isolated concerns into shared purpose and converting scepticism into curiosity.

Clear, compassionate, and conviction-driven communication unlocks human potential for extraordinary change. It inspires individuals to see themselves as part of the solution, enables communities to envision a better future, and empowers societies to take bold action.

Every conversation we facilitate today, every story we tell, and every connection we forge contribute to a larger narrative about what kind of future we are committed to creating together for future generations. In our interconnected world, the quality of our communication directly influences the speed and scale of climate action we can achieve, ultimately determining whether we can mobilise the collective motivation necessary to address one of humanity's most pressing challenges.

And always remember that what we think we say is often not what others hear. Effective communication means listening as much as speaking, adapting, refining, and constantly seeking to improve your message so it truly reaches and moves your audience.

Created by Sandhya Prabhat

REFERENCES

https://www.c40.org/wp-content/uploads/2021/11/C40_GYMF_Report4.pdf

https://www.sgp.undp.org/images/Publication%20Youth%20in%20Action%20on%20Climate%20Change%20Inspirations%20from%20Around%20the%20World%20English-%20SGP%20examples.pdf

https://wmo.int/media/magazine-article/empowering-next-generation-wmo-youth-climate-action

https://www.weatherkids.org/

https://www.nlc.org/wp-content/uploads/2017/08/ecoAmerica-Lets-Talk-Communities-and-Climate-NLC-8.2.pdf

https://climateoutreach.org/reports/public-engagement-philanthropy-summary/#

https://wwfint.awsassets.panda.org/downloads/wwf_public_engagement_guide_for_cities_2021_with_annexes.pdf

https://www.washingtonpost.com/science/most-american-teens-are-frightened-by-climate-change-poll-finds-and-about-1-in-4-are-taking-action/2019/09/15/1936da1c-d639-11e9-9610-fb56c5522e1c_story.html

https://blog.boon.so/climate-action-slogan-ideas/

https://www.un.org/en/climatechange/communicating-climate-change

https://ichigobloom.jp/thinking-outside-the-box-5-unconventional-ways-to-raise-climate-awareness/

https://www.ted.com/talks/kris_de_meyer_feeling_stuck_on_climate_change_here_s_what_to_do

https://welovecities.org/

https://naturebridge.org/programs/school-environmental-science

https://www.environnement.gov.ma/ar/tous-ecolos ar?id=369&utm_source=chatgpt.com

https://unfccc.int/sites/default/files/resource/NAP-Saint-Lucia-2018.pdf

http://www.ladder-project.eu/wp-content/uploads/2016/04/4.-26-ways-to-turn-your-local-authority-more-sustainable.pdf

https://www.dailymail.co.uk/femail/food/article-2693000/Forget-ugli-fruit-meet-ugly-fruit-bowl-French-supermarket-introduces-lumpy-misshapen-fruit-vegetables-sold-30-discount-combat-food-waste.html

https://www.voicesofyouth.org/climatechange_rights

https://www.ipcc.ch/site/assets/uploads/2017/08/Climate-Outreach-IPCC-communications-handbook.pdf

https://nexioprojects.com/threats-and-opportunities-of-climate-change/

https://www.oecd.org/content/dam/oecd/en/publications/reports/2013/02/green-innovation-in-tourism-services_g17a2252/5k4bxkt1cjd2-en.pdf

https://www.voicesofyouth.org/climatechange_rights

https://www.voicesofyouth.org/climategovernance

https://www.voicesofyouth.org/campaign/get-inspired-young-people-participating-climate-action

https://www.voicesofyouth.org/generationgreen

www.un.org/sustainabledevelopment/climate-action-superheroes

https://www.sgi.gov.sa/

https://www.plant-for-the-planet.org/

https://www.weatherkids.org/

Annexes

Annex II to Section II
Laying the Groundwork for the SEACAP Preparation

Country

Local Authority

Logo

Postal Address

Email

Social media page

Origin of the name and other names

Insert the map of a town/city with its boundaries and the names of main places

Confirming the Political Endorsement of the SEACAP

Engaging the SEACAP preparation parties

SEACAP Coordinators

Members of the Steering Committee

Members of the Technical Committee

Associating the SEACAP Stakeholders

- Professionals and technicians affiliated to support the preparation of the plan

- Partners and National authorities' stakeholders and engagement required from them to support the preparation and implementation of the SEACAP.

- Partners and community stakeholders and engagement required from them to support the preparation and implementation of the SEACAP.

- Measures to strengthen stakeholder's support in preparing and implementing the SEACAP.

Annex 1 to Chapter 1:
Municipality Description and SEACAP Vision

1.1 Defining the SEACAP GHG Emissions Reduction Target

The SEACAP Target to Reduce GHG Emissions

Nationally Determined Contributions

1.2 Overviewing the Municipality's Existing Conditions

The geographical features
- The LA surface, location, borders, coordinates & altitude; Type of landscape; and weather conditions

Population and Employment
- Population; Employment sectors; and unemployment percentages

Economic sectors, resources and activities, related obstacles and needs
- Agriculture sector; Livestock sector; Industrial sector; Commercial sector; Tourism sector and tourist sites; Financial institutions

Infrastructure & services, coverage and quality, problems and shortages
- Water (Irigation, Drinking and waste water) ; Telecommunication; Energy and Electricity; Roads and transportation; Solid waste; Health; Education; Supporting institutions and support from the private sector

1.3. The SEACAP Strategy

The long term vision of the local authority

Local and National Climate Plans that are complemented by the SEACAP

Consolidating the LA Administrative Structures

- The administrative structure of the LA and its capacity to lead the preparation and implementation of the SEACAP

- Sources to finance the SEACAP preparation and Implementation

Annexes 2 to Chapter 2
Baseline Emission Inventory (BEI)

The BEI Development Process

To develop the BEI, energy consumption data is measured in different units, depending on the source. Electricity is recorded in kilowatt-hours (kWh) and converted to CO equivalent using the electricity conversion factor. For liquid fuels such as diesel, consumption is measured in litres, which are converted to their equivalent kWh before applying the relevant CO conversion factor. Similarly, gas consumption is calculated by weight and converted accordingly. These calculations follow the SEACAP Preparation Manual.

2.1 Defining the BEI Geographical Area, (administrative area covered by the SEACAP

2.2 The selected baseline year

2.1.3 Reporting BEI sectors

2.1.4 Calculating GHG by Energy sources

Including several existing methods to calculated GHG emissions,
The first relies on Intergovernmental Panel on Climate change (IPCC) focusing on CO2 emissions alone or including other gases such as methane and nitrous oxide
The second, the Life Cycle Assessment (LCA) method, evaluates emissions across a product's full life cycle, from resource extraction to production.
The third is the Per-Capita method, which provides a simplified estimate by dividing total emissions by population, useful when detailed data is unavailable.

2.2 Energy consumption data per building sector

2.2.1 The local authority's buildings and facilities

Report the energy consumption data for each building and facility separately; than add and report the total for all the buildings and facilities

Put the data of each building or facility separately

- Name and type of building or facility
- Annual amount of electricity consumption
- Amount of renewable energy used
- Total annual electricity consumption
- Actual annual cost of electricity consumption
- Amount of fuel consumed annually for heating
- The annual cost of purchasing fuel for heating
- Additional information related to the building energy consumption

Repeat the above for each building and facility

Report the total data for all buildings and facilities

- Total Number of Municipal Buildings and Facilities
- Total Annual amount of electricity consumption
- Total Amount of renewable energy used
- Total annual electricity consumption
- Total Actual annual cost of electricity consumption
- Total amount of fuel consumed annually for heating
- Total annual cost of purchasing fuel for heating

2.2.2 Residential Sector Buildings:

To calculate emissions from the residential sector - based on electricty consumption - the total consumption should first be defined, before converting it into emmissions based on specific equations.
In case this total is not available, it can be gathered and estimated from the following sources:

- Total number of residential buildings (can be obtained from national statistics center).
- Average Area (in square meters) of a typical household
- Average Electricity Consumption per Residential Building
- Average Electricity Bill per Household per Month:
- Number estimated of Solar water heaters.
- Number estimated of Photovoltaic Solar PV (data from utility company could be used).
- **Total Electricity Consumption in the Residential Sector**
- To calculate total electrical emission consumption in the Residential Sector:
- Calculate annual electricity emissions:
Annual Consumption * emission factor (specific for each country)
- Collect annual fuel consumption used for space heating
- Calculate annual fuel emissions:
Annual Consumption * emission factor (specific for type of fuel)
- **Total emission consumption (electrical +fuel) in residential building**

2.2.3 The Tertiary Buildings Sector

2.2.4: The Industrial Sector

The methodology applied to assess emissions in the tertiary buildings' sector and in the Industrial sector are identical to that of residential buildings.

2.2.5 Energy Consumption in Public Lighting

After analyzing the bills paid to the electricity companies, the energy consumed is calculated by applying a special formula that includes the number of public street lamps and their average operating hours throughout the year, and comparing the results with the cost recorded in the bills.

This information will help suggest energy-saving measures, reduce annual energy cost and emissions.

Based on the selected baseline year, the annual electricity consumption for public lighting is measured in kilowatt-hours (kWh)

- Annual energy bill in local currency
- Annual maintenance cost in local currency
- Total Number of street lights
- Number of public lighting sub stations

Type of street lighting and quantity of lamps	Watt per lamp	Quantity	Annual consumed energy in MWh= Total watt* annual operation hours/1000
LED			
HPS			
Metal halide			
Other			
Annual GHG Emissions in tCO2-eq			
Annual consumed energy in MWh* emission factor for Electricity			

Annex 2 to Chapter 2
Baseline Emission Inventory (BEI)

2.3 Transportation Sector

2.3.1 Local Authority Fleet

Calculating the fuel consumed by the municipal fleet over the baseline year includes brief information about the fleet type, count, and estimated consumption over the baseline year.

The resulting CO2 equivalent emissions will serve as the baseline for comparison when SEACAP plan measures are applied.

Calculation of the fuel consumed by the LA Fleet	Quantity	Annual fuel consumption		Annual fuel bill in local currency
Type of Cars		Diesel (lt)	Gasoline (lt)	
LA Passenger Vehicles				
Light trucks < 4 tons				
Medium to large trucks > 4 tons				
Construction machineries				
Other vehicles				

2.3.2 Solid Waste Management fleet

Calculating the annual fuel consumption for the solid waste management fleet include brief information about the fleet type, count, and estimated consumption over the baseline year.

Calculation of fuel consumed by the solid waste collection & transport fleet	Quantity	Annual fuel consumption		Average daily travelled distance	Annual fuel bill in local currency
		Diesel (Lt)	Gasoline (Lt)		
Garbage vehicles					

2.3.4 Public transport

Calculate the annual fuel consumption of public transport.

Public transport	Annual consumption of Diesel (lt)	Annual consumption of Gasoline (lt)
Medium Bus 22 passengers		
Bus 40 passengers		
Others		

2.3.5 Private transport

Calculating the annual fuel of private transportation by calculating the number of private cars and the estimated average consumption of fuel per km for each vehicle category, according to information obtained from the concerned national authority.

Private cars	Quantity	Annual consumption of Gasoline (lt)
Taxi cars		
Two wheels		
Small cars		
Medium cars		
Large cars		

2.4 Assessing Emissions from Solid Waste Landfills

Non energy source

Solid waste	How much waste is produced annually	how much is being recycled	waste composition

Annex 3 to Chapter 3:
3.1 Current Climate Hazards, their Probabilities and Impacts

Climate Hazards	Probability Low, Moderate, High, Not known				Impact of climate hazard Low, Moderate, High, Not known			
	L	M	H	NK	L	M	H	NK
Extr eme heat								
Extreme cold								
Precipitation								
Heavy rainfall								
Heavy snowfall								
Fog								
Hail								
Floods & sea level rise								
Flash / surface flood								
River flood								
Coastal flood								
Groundwater flood								
Permanent inundation								
Droughts & water scarcity								
Storms								
Severe wind								
Tornado								
Cyclone (hurricane / typhoon)								
Tropical storm								
Extratropical storm								
Storm surge								
Lightning / thunderstorm								

Annex 3 to Chapter 3:
3.1 Current Climate Hazards, their Probabilities and Impacts

Climate Hazards	Probability Low, Moderate, High, Not known				Impact of climate hazard Low, Moderate, High, Not known			
	L	M	H	NK	L	M	H	NK
Mass movement								
Landslide								
Avalanche								
Rockfall								
Subsidence								
Wild fires								
Forest fire								
Land fire								
Chemical change								
Saltwater intrusion								
Ocean acidification								
Atmospheric CO2 concentrations								
Biological hazards								
Water-borne disease								
Vector-borne disease								
Airborne disease								
Insect infestation								
Other								

3.2 Future Climate Hazards, their Intensity and Frenquency

Climate Hazards	Change of intensity: Increase Decrease No change Not known	Change of frequency: Increase Decrease No change Not known	Excepted Timeframe Short term 20 -30 years Midterm: after 2050 Long term: +- 2100. Not known
Extr eme heat			
Extreme cold			
Precipitation			
Heavy rainfall			
Heavy snowfall			
Fog			
Hail			
Floods & sea level rise			
Flash / surface flood			
River flood			
Coastal flood			
Groundwater flood			
Permanent inundation			
Droughts & water scarcity			
Storms			
Severe wind			
Tornado			
Cyclone (hurricane / typhoon)			
Tropical storm			
Extratropical storm			
Storm surge			
Lightning / thunderstorm			

3.2 Future Climate Hazards, their Intensity and Frenquency

Climate Hazards	Change of intensity: Increase Decrease No change Not known	Change of frequency: Increase Decrease No change Not known	Excepted Timeframe Short term 20 -30 years Midterm: after 2050 Long term: +- 2100. Not known
Mass movement			
Landslide			
Avalanche			
Rockfall			
Subsidence			
Wild fires			
Forest fire			
Land fire			
Chemical change			
Saltwater intrusion			
Ocean acidification			
Atmospheric CO2 con-centrations			
Biological hazards			
Water-borne disease			
Vector-borne disease			
Airborne disease			
Insect infestation			
Other			

3.3 Vulnerable Sectors.

Climate hazards	Relevant vulnerable sector(s)	Current vulnerability level	Indicator
Select the hazards selected in Table 1 above. (Ignore the rest of the hazards)	Choose from the list above When more than one sector is relevant, add separate row(s)	Select one choice Low (L) Moderate (M) High (H) Not known (NK)	Choose an indicator from Annex 3.6, Table 1, along with a unit and numeric value, or write down your own indicator.
Extreme heat Extreme cold Precipitation Floods & sea level rise Droughts & water scarcity Storms Mass movement Wild fires Chemical Change Biological hazards Other [Please specify]	Buildings		
	Transport		
	Energy		
	Water		
	Waste		
	Land use planning		
	Agriculture & forestry		
	Environment & biodiversity		
	Health		
	Civil protection & emergency		
	Tourism		
	Education		
	ICT (Information & communication technologies)		
	All listed sectors		
	Multiple sectors		
	Not known		

3.4 Adaptive Capacity

Impacted sector(s)	Relevant climate hazard(s)	Adaptive capacity factor(s)	Current adaptive capacity level	Indicator
	Select the same hazards selected in Table 1 above. Ignore the rest of the hazards.	Multiple choice: Access to services Socio-economic Governmental & institutional Physical & environmental Knowledge & innovation	Single choice: Low Moderate High Not known	Choose an indicator from Annex 3.6, Table 2, along with a unit and numeric value, or write down your own indicator.
Buildings		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Transport		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Energy		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Water		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Waste		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Land use planning		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Agriculture & forestry		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Environment & biodiversity		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Health		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Civil protection & emergency		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Tourism		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
Education		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own
ICT (Information & communication technologies)		Choose from the list above	Choose from the list above	Choose from Annex 3.6 or write down your own

3.5 Vulnerable population groups		
Climate hazards		**Most vulnerable population group(s)**
		Multiple choice: Women and girls Children Youth Elderly Marginalized groups Persons with disabilities Persons with chronic diseases Low-income households Unemployed persons Persons living in sub-standard housing Migrants and displaced people Other All listed population groups Not known
Extreme heat		Choose from the list above
Extreme cold		Choose from the list above
Heavy precipitation		Choose from the list above
Floods & sea level rise		Choose from the list above
Droughts & water scarcity		Choose from the list above
Storms		Choose from the list above
Mass movement		Choose from the list above
Wild fires		Choose from the list above
Other	[please specify]	

ANNEX 3.6 - Indicators for Adaptation.

Select the same hazards selected in Table 1 above. Ignore the rest of the hazards. Then, choose (i.e., copy and paste) the relevant sectors from the list. When more than one sector is relevant, add separate rows for each sector and indicate the level of vulnerability associated with each identified sector. Then, choose an indicator from Annex 3.6, Table 1, along with a unit and numeric value, or write down your own indicator.

ANNEX 3.6 - Indicators for Adaptation				
Table 1 Vulnerable sectors				
ID#	Sector	Indicator	Measurement unit	Numerical value
1.1	Buildings	Number or % of (public/residential/tertiary) buildings damaged by extreme weather conditions/events	Per year / over a certain period	
1.2	Transport, Energy, Water, Waste, ICT, Civil Protection & Emergency	Number or % of transport/energy/water/waste/ICT infrastructure damaged by extreme weather conditions/events		
1.4		Number of days with public service interruptions (e.g. energy/water supply, health/civil protection/emergency services, waste)	No.	
1.3	Land Use Planning	% of grey/blue/green areas affected by extreme weather conditions/events (e.g. Heat Island Effect, Flood, Rockfalls and/or Landslides, Forest/Land Fire)	%	
1.5	Transport, Energy, Water, Waste, Civil Protection & Emergency	Average duration (in hours) of the public service interruptions (e.g. energy/water supply, public transport traffic, health/civil protection/emergency services)	Hours	
1.6	Health	Number of people injured/evacuated/relocated due to extreme weather event(s) (e.g. heat or cold waves)	Per year / over a certain period	
1,7		Number of deaths related to extreme weather event(s) (e.g. heat or cold waves)		
1.8	Health	Number of water quality warnings issued	No.	
1.9		Number of air quality warnings issued		
1.10	Civil Protection & Emergency	Average response time (in min.) for police/fire-fighters, emergency services in case of extreme weather events	Minutes	
1.11	Environment & Biodiversity	% of areas affected by soil erosion / soil quality degradation	%	
1.12		% of habitat losses from extreme weather event(s)		
1.13		% change in number of native species		
1.14		% of native (animal/plant) species affected by diseases related to extreme weather conditions/events		
1.15	Agriculture & Forestry	% of agriculture losses from extreme weather conditions/events (e.g. drought/water scarcity, soil erosion)		
1.16		% of livestock losses from extreme weather conditions		
1.17		% change in crop yield / evolution of annual grassland productivity		
1.18		% of livestock losses from pests/pathogens		
1.19		% of timber losses from pests/pathogens		
1.20		% change in Forest composition		
1.21		% change in water abstraction		
1.22	Tourism	% change in tourist flows / tourism activities	%	
1.23	Other	Annual economic losses (e.g. in commercial, agricultural, industrial, touristic sectors) due to extreme weather event(s)	Local Currency, year	
1.24		Annual amount of compensation received (e.g. insurance)		

ANNEX 3.6 - Indicators for Adaptation				
Table 2 Adaptive capacity				
ID#	Adaptive capacity factor	Indicator	Measure-ment unit	Numeri-cal value
2.1	Socio-economic	% of public funds available to address a climate hazard and its impacts (e.g. fire, flood, heatwave, etc)	%	
2.2	Socio-economic	% share of vulnerable population groups (e.g. elderly (65+)/young (25-) people, lonely pensioner households, low-income/unemployed households, migrants and displaced people) - compared to national average in year X in country X	%	
2.3	Socio-economic	Number of households educated in house energy/ water/waste management	No.	
2.4	Socio-economic	Population density (compared to national/regional average in year X in country/region X)	People per km2	
2.5	Socio-economic	% of population living in areas at risk (e.g. flood/ drought/heat wave/ forest or land fire)	%	
2.6	Governmen-tal & institu-tional	% change in green & blue infrastructure/areas (e.g. through new urban planning regulation/policy)	%	
2,7	Physical & environ-mental	Length of transport network (e.g. road/rail) located in areas at risk (e.g. flood/drought/heat wave/ forest or land fire)	Km	
2.8	Physical & environ-mental	Average time needed to reach a health facility	Hours	
2.9	Physical & environ-mental	% of areas non-accessible for emergency responses (e.g. firefighting services)	%	
2.10	Physical & environ-mental	% of residential, commercial, agricultural, industrial, touristic areas at risk (e.g. flood/drought/heat wave/ forest or land fire)	%	
2.11	Knowledge & technol-ogy	Hours needed to inform population of a risk via an early warning system	Hours	

Annex 4 : Access to Energy- Action description

Key actions			
1)	Type of action	Mitigation Adaptation Access to Energy	
2)	Title of the action		
3)	Origin of the action	1- Local authority 2- Covenant coordinator or supporter 3-National 4-Regional 5-Mixed 6-Other	
4)	Responsible body		
5)	Short description		
6)	Implementation timeframe	Start:	End:
7)	Implementation status		
8)	Stakeholders involved	Select the stakeholders related to this action: 1-National government / agency(ies) 2- Sub-national governments(s) and/or agency(ies) 3-Business & private sector 4- Trade unions 5- Academia 6-Education sector 7-NGOs & civil society and 8 Citizens	
9)	Total implementation costs	€ or local currency	
10)	Source of funding	- Local authority's own resources - Regional funds and programmes - National funds and programmes - EU funds and programmes - Public-private partnerships - Private partnerships Other	
11)	Investment costs	€ or local currency	
12)	Non-investment costs	4	

Key actions				
Access to Sustainable Energy				
Production of Renewable Energy	In KWp	In KWh		
Macro-area targeted:	Climate Socio-economic Facilities / Housing Mobility Policy and regulatory framework Participation / awareness-raising			
Vulnerable population group(s) targeted	- Women and girls - Children - Youth - Elderly - Marginalized groups - Persons with disabilities - Persons with chronic diseases - Low-income households - Unemployed persons - Persons living in sub- standard housing - Migrants and displaced people - Other			
Vulnerable population group(s) targeted	- Women and girls - Children - Youth - Elderly - Marginalized groups - Persons with disabilities - Persons with chronic diseases - Low-income households - Unemployed persons - Persons living in sub- standard housing - Migrants and displaced people - Other			
Outcome(s) reached				
	Description:			
	Related indicator:	[Please specify]	[numerical value]	[Unit]

Annex 5: Selection of Mitigation Actions

Mitigation actions	Actions	
Sector	Area of Intervention	Examples of Actions
Building		
Municipal buildings, equipment/ facilities	Energy Audits and Monitoring:	- Conduct regular energy audits to identify inefficiencies. - Implement real-time energy monitoring systems to track usage and identify wastage.
	Retrofit and Upgrade Infrastructure:	- Upgrade lighting systems to efficient LED lights. - Installing Occupancy Sensors - Install energy-efficient HVAC systems. - Improve insulation, roof insulation and window glazing to reduce heating and cooling demands. - Maintaining AC systems and other equipment used in buildings reduces energy costs.
	Renewable Energy Integration:	- Install solar panels on rooftops or unused land.
	Behavioral Change Programs:	- Educate staff on energy-saving practices. - Implement automatic shut-off systems for lights and equipment when not in use. - Developing public procurement policies that incentivise using materials with low-carbon footprints in public procurement
	Green Building Standards:	- Adopt green building certifications like LEED for new constructions and major renovations. - Encourage sustainable procurement policies for energy-efficient appliances and equipment
	Information and Communication Technologies	- Replacing Paperwork with Computer Work & Digitizing Infrastructure.
Public Street Lighting	Energy efficiency: Transition to LED Lighting	- LED Retrofitting: Replace traditional streetlights (e.g., incandescent, fluorescent, or sodium vapor lamps) with energy-efficient LED lights, which consume less energy and have a longer lifespan. - Pilot Programs: Initiate pilot programs to test LED lighting in select areas before full-scale implementation
	Information and Communication Technologies: Smart Lighting Systems	- Intelligent Control Systems: Install smart lighting control systems that use sensors and timers to adjust lighting based on real-time conditions, such as traffic flow and ambient light levels. - Adaptive Lighting: Implement adaptive lighting systewms that dim or brighten lights based on pedestrian and vehicle presence, weather conditions, and time of day.
	Renewable Energy Integration	- Solar Street Lights: Deploy solar-powered streetlights in suitable locations to harness renewable energy and reduce reliance on the grid. - Hybrid Systems: Use hybrid lighting systems that combine solar power with grid electricity to ensure reliability while maximizing renewable energy use. - Modernising the street lights' protection components, by installing surge protection, proper grounding systems, astronomical timers, switching elements, energy consumption metering, differential relays, and permanent over-voltage protection.
	Energy-Efficient Design and Layout	- Optimized Pole Spacing: Review and optimize the spacing and height of light poles to ensure efficient coverage with minimal energy use. - Reflective Materials: Use reflective road surfaces and signage to enhance visibility and reduce the need for excessive lighting.
	Maintenance and Management	- Regular Maintenance: Implement a regular maintenance schedule to ensure streetlights are clean, functioning efficiently, and free from damage or obstructions. - Asset Management Systems: Utilize asset management systems to track the condition and performance of street lighting infrastructure, enabling timely interventions and upgrades.
	Community and Stakeholder Engagement	- Public Awareness Campaigns: Educate the community about the benefits of energy-efficient street lighting and encourage public support for energy-saving initiatives. - Stakeholder Collaboration: Collaborate with local governments, utility companies, and technology providers to develop and implement sustainable street lighting projects.

Tertiary (non municipal) buildings, equipment/ facilities	Energy Efficiency Standards	- Enforce building codes that mandate high energy efficiency for new constructions and renovations. - Provide incentives for retrofitting existing buildings with energy-saving technologies.
	Public-Private Partnerships	- Collaborate with private sector stakeholders to promote energy efficiency projects. - Offer tax incentives or rebates for businesses that implement energy-saving measures.
	Smart Technology Adoption	- Encourage the use of smart thermostats, lighting, and energy management systems. - Implement IoT (Internet of Things) solutions to optimize energy use in real-time.
	Green Leasing	- Promote green lease agreements that incentivize both landlords and tenants to pursue energy-efficient improvements.
	Awareness and Training Programs	- Conduct workshops and seminars to educate building owners and managers on energy efficiency best practices.
Residential buildings	Energy-Efficient Appliances	- Promote the use of Energy Star-rated appliances. - Provide subsidies or rebates for the purchase of energy-efficient home appliances.
	Home Insulation and Weatherization	- Offer incentives for improving home insulation and weatherproofing. - Provide grants or low-interest loans for homeowners to make energy-efficient upgrades.
	Renewable Energy for Homes	- Facilitate the installation of residential solar panels through subsidies and streamlined permitting processes. - Promote community solar programs for those unable to install their own systems. - Assigning a “House Doctor” to support homeowners in improving their house insulation and recommending cost-effective energy solutions,
	Energy Education Programs	- Launch campaigns to educate homeowners on simple energy-saving practices. - Provide resources and tools for conducting home energy assessments. - Encouraging Energy Audits, LA can encourage energy audits through a professional body or an energy consultant. - Raising occupants’ awareness is
	Smart Home Technologies	- Encourage the adoption of smart home devices such as programmable thermostats and smart plugs. - Provide information on how these technologies can reduce energy consumption and lower utility bills. - Promoting Deep Energy Renovation at scale

Industry	Energy Audits and Management Systems	- Energy Audits: Conduct comprehensive energy audits to identify inefficiencies and opportunities for energy savings. - Energy Management Systems (EMS): Implement EMS to monitor, control, and optimize energy consumption in real-time.
	Energy Efficiency Improvements	- Equipment Upgrades: Replace outdated and inefficient equipment with energy-efficient models. Focus on high-consumption equipment like boilers, motors, and compressors. - Process Optimization: Streamline manufacturing processes to reduce energy wastage. Implement advanced process control systems to optimize production efficiency. - Heat Recovery: Utilize waste heat recovery systems to capture and reuse heat generated in industrial processes.
	Renewable Energy Integration	- On-site Renewable Energy: Install solar panels, wind turbines, or biomass generators to produce renewable energy on-site. - Power Purchase Agreements (PPAs): Enter into PPAs with renewable energy providers to source green energy. - Combined Heat and Power (CHP): Implement CHP systems to simultaneously generate electricity and useful heat from the same energy source.
	Sustainable Supply Chain Practices	- Supplier Engagement: Encourage suppliers to adopt energy-efficient practices and renewable energy sources. - Sustainable Procurement: Prioritize purchasing from suppliers with strong sustainability credentials and certifications.
	Industrial Symbiosis and Circular Economy	- Waste-to-Energy: Convert industrial waste into energy through processes like anaerobic digestion or incineration with energy recovery. - Material Efficiency: Implement measures to reduce material waste and promote recycling and reuse within the production process.
	Smart Technologies and Automation	- IoT and Industry 4.0: Deploy Internet of Things (IoT) devices and Industry 4.0 technologies to enhance process monitoring and control, leading to improved energy efficiency. - Automation: Invest in automation and robotics to enhance precision and reduce energy wastage in production processes.
	Employee Engagement and Training	- Energy Awareness Programs: Educate employees about energy-saving practices and the importance of energy efficiency. - Training: Provide training on energy management systems and efficient operation of machinery and equipment.
	Energy-Efficient Building Design	- Green Building Standards: Design and construct industrial buildings according to green building standards such as LEED or BREEAM. - Lighting and HVAC: Upgrade to energy-efficient lighting (e.g., LEDs) and HVAC systems. Implement smart controls for lighting and climate management.

Transport	Municipal Transport		
	Transition to hybrid vehicles	- Replace municipal fleet vehicles with hybrid vehicles. - Install EV charging stations at municipal facilities and public areas.	
	Fleet Optimization	- Implement route optimization software to minimize fuel consumption. - Encourage carpooling and shared use of municipal vehicles.	
	Alternative Fuels	- Integrate alternative fuels such as biodiesel or compressed natural gas (CNG) into the municipal fleet. - Pilot hydrogen fuel cell vehicles for specific applications.	
	Public Transportation Enhancements	- Expand and improve public transportation options to reduce the need for municipal vehicle use. - Encourage the use of public transportation for municipal employees through incentives.	
	Bike-Sharing Programs	- Implement bike-sharing programs for short-distance municipal trips. - Provide infrastructure such as bike lanes and secure parking.	
	Sustainable Procurement Policies	- Adopt green procurement policies for new vehicle purchases, prioritizing low-emission and energy-efficient models. - Set standards for vehicle emissions and fuel efficiency in municipal contracts.	
	Public Transport		
	Electrification of Public Transport	- Transition buses and other public transport vehicles to electric or hybrid models. - Develop infrastructure for electric bus charging at depots and key stops.	
	Expansion of Public Transport Networks	- Expand bus routes, metro lines, and tram systems to increase coverage and accessibility. - Implement Bus Rapid Transit (BRT) systems to improve efficiency and reduce travel times.	
	Renewable Energy Integration	- Power public transport systems using renewable energy sources such as solar or wind. - Install solar panels on bus and train stations.	
	Fare Incentives and Subsidies	- Offer reduced fares or subsidies for frequent public transport users. - Implement incentives for off-peak travel to reduce congestion and energy use.	
	Smart Public Transport Systems	- Use smart ticketing and real-time tracking to optimize routes and schedules. - Provide real-time information to passengers through mobile apps and digital displays.	
Transport	Private Transport		
	Promotion of EV Adoption	- Provide incentives for the purchase of electric and hybrid vehicles, such as tax credits and rebates. - Expand the network of public EV charging stations.	
	Carpooling and Ride-Sharing	- Promote carpooling and ride-sharing services to reduce the number of vehicles on the road. - Implement dedicated carpool lanes and incentives for ride-sharing.	
	Non-Motorized Transport	- Develop infrastructure for walking and cycling, including bike lanes, pedestrian paths, and secure bike parking. - Implement bike-sharing programs for last-mile connectivity.	
	Congestion Pricing	- Introduce congestion pricing in busy urban areas to reduce traffic and encourage the use of public transport. - Use revenue from congestion pricing to fund sustainable transport initiatives.	
	Public Awareness Campaigns	- Launch campaigns to educate the public on the benefits of sustainable transport and energy-saving driving practices. - Promote eco-driving techniques that reduce fuel consumption and emissions.	
	Urban Planning and Zoning	- Encourage mixed-use development to reduce the need for long commutes. - Plan for high-density residential areas near public transport hubs.	

Solid Waste	Waste Reduction and Prevention	1. Public Awareness Campaigns: - Educate the community on waste reduction practices such as reducing, reusing, and recycling. - Promote the use of reusable products and packaging. 2. Policy and Regulation: - Implement policies to reduce single-use plastics and encourage the use of eco-friendly alternatives. - Enforce regulations that mandate waste segregation at the source. 3. Incentive Programs: - Provide incentives for businesses and households that demonstrate effective waste reduction practices. - Introduce pay-as-you-throw schemes to encourage waste minimization.
	Recycling and Composting	1. Enhanced Recycling Programs: - Expand and improve recycling programs to increase the types and volumes of materials collected. - Applying Sorting at the Source and establish recycling drop-off centers and curbside collection services. 2. Organic Waste Management: - Implement community composting programs for organic waste. - Encourage households and businesses to compost organic waste through subsidies and educational programs. 3. Material Recovery Facilities (MRFs): - Invest in MRFs to efficiently sort and process recyclable materials. - Use advanced technologies to improve the efficiency and effectiveness of recycling operations.
	Waste-to-Energy (WtE) and Anaerobic Digestion	1. Waste-to-Energy Facilities: - Develop WtE plants to convert non-recyclable waste into energy through incineration or gasification. - Ensure WtE plants meet stringent environmental standards to minimize emissions. 2. Anaerobic Digestion: - Implement anaerobic digestion systems to convert organic waste into biogas and digestate. - Use biogas as a renewable energy source for electricity generation or as a fuel for vehicles.
	Landfill Management	3. Landfill Gas Capture: - Install systems to capture methane gas from landfills and convert it into energy. - Use captured landfill gas for electricity generation or as a direct energy source for nearby facilities. 4. Landfill Diversion: - Implement strategies to divert waste from landfills, such as increased recycling and composting programs. - Promote extended producer responsibility (EPR) programs to encourage manufacturers to take back and recycle their products.
	Circular Economy Initiatives	1. Product Design and Lifecycle Management: - Encourage manufacturers to design products with longer lifespans and ease of recycling in mind. - Promote take-back and recycling programs for products at the end of their lifecycle. 2. Resource Recovery: - Develop systems for recovering valuable materials from waste streams. - Foster markets for recycled materials to ensure their use in new products.
TOTAL	0	

Annex 6: Selection of Adaptation actions

Adaptation actions		
Buildings	Climate-Resilient Building Design	1. Green Building Standards: - Adopt green building certifications like LEED, BREEAM, or WELL that emphasize energy efficiency, renewable energy, and climate resilience. - Implement passive design strategies to reduce energy use for heating, cooling, and lighting. 2. Climate-Resilient Materials: - Use durable, climate-resistant materials that can withstand extreme weather conditions, such as high winds, floods, and heatwaves. - Incorporate materials with high thermal mass to moderate indoor temperatures. 3. Flood-Resistant Construction: - Elevate buildings in flood-prone areas and design foundations to resist water intrusion. - Install permeable paving, green roofs, and rain gardens to manage stormwater. 4. Heat-Resistant Design: - Implement cool roofs and green roofs to reduce heat absorption. - Design buildings with proper shading, ventilation, and reflective materials to reduce heat gain. - Implementing cool surfaces like white roofs and walls and promoting cooling materials on roofs and pavements
Transport		1. Electrification of Transport: • Transition to electric vehicles (EVs) for public and private transport. • Develop infrastructure for EV charging stations, including in remote areas. 2. Public Transport Enhancement: • Expand and improve public transportation systems to reduce reliance on private cars. • Introduce bus rapid transit (BRT) and light rail systems. 3. Alternative Fuels: • Promote the use of biofuels, hydrogen, and compressed natural gas (CNG) for transport. • Support research and development of sustainable fuel technologies. 4. Infrastructure Resilience: • Design and retrofit transport infrastructure to withstand extreme weather events. • Implement flood-resistant designs for roads, bridges, and tunnels.
Energy	Adaptive Management and Maintenance	1. Resilient Operations and Maintenance: - Develop and implement maintenance plans that prioritize resilience to climate impacts. - Train building managers and occupants on climate risk management and adaptive practices. 2. Emergency Preparedness: - Create emergency response plans for extreme weather events and natural disasters. - Equip buildings with emergency power supplies, such as generators or battery storage, to ensure continuity of operations during outages.
Water	Water Conservation and Management	1. Water-Efficient Fixtures: - Install low-flow faucets, showerheads, and toilets to reduce water use. - Implement greywater recycling systems to reuse water for non-potable applications. - monitoring and managing water use, promptly fixing leaks, and installing water meters to track consumption 2. Rainwater Harvesting: - Install rainwater harvesting systems to collect and store rainwater for irrigation and other non-potable uses. - Use cisterns and rain barrels to manage water supply during dry periods. 3. Green Infrastructure: - Implement green roofs, walls, and urban gardens to manage stormwater, reduce heat island effects, and enhance biodiversity. - Design landscapes to retain and filter stormwater through bioswales, rain gardens, and permeable surfaces. 4. Climate-smart agriculture, using drip irrigation and other water-efficient methods 5. Expand wastewater reuse through wastewater treatment plants to replace using freshwater supplies under stress.
		1. Waste Reduction: - Promote waste reduction, reuse, and recycling programs. - Implement policies to reduce single-use plastics and packaging. 2. Waste-to-Energy: - Develop facilities to convert waste into energy. - Promote anaerobic digestion for organic waste. 3. Landfill Management: - Improve landfill management to minimize methane emissions. - Implement landfill gas capture and utilization systems. 4. Circular Economy: - Encourage product design for reuse and recycling. - Foster markets for recycled materials

Land Use Planning		5. Resilient Urban Design: • Implement green infrastructure like parks, green roofs, and urban forests. • Design urban areas to manage heat, water, and storm impacts. 6. Zoning Regulations: • Develop zoning regulations that promote climate resilience and sustainability. • Protect natural areas and limit development in high-risk zones. 7. Integrated Planning: • Incorporate climate risk assessments into land use planning. • Engage communities in participatory planning processes. 8. Smart Growth: • Promote compact, mixed-use development to reduce transportation needs and enhance resilience.
Agriculture & Forestry		1. Climate-Resilient Crops: • Promote the use of drought-resistant and flood-tolerant crop varieties. • Implement advanced irrigation and water management techniques. 2. Sustainable Practices: • Encourage sustainable farming practices like agroforestry, conservation tillage, and organic farming. • Support reforestation and afforestation projects. 3. Biodiversity Conservation: • Protect and restore natural habitats and ecosystems. • Promote sustainable forestry management practices. 4. Soil Health: • Implement soil conservation techniques to enhance resilience to climate impacts. • Promote the use of cover crops and crop rotation.
Environment & Biodiversity		1. Habitat Protection: • Establish protected areas and conservation zones. • Restore degraded ecosystems and habitats. 2. Species Conservation: • Develop programs to protect endangered species. • Implement biodiversity monitoring and research. 3. Green Infrastructure: • Use natural solutions like wetlands and urban green spaces to manage climate impacts. • Promote ecosystem-based adaptation strategies. 4. Pollution Control: • Implement measures to reduce pollution and enhance air and water quality. • Promote sustainable waste management practices.
Health		1. Climate-Resilient Healthcare Facilities: • Upgrade healthcare infrastructure to withstand extreme weather events. • Ensure backup power and water supply for healthcare facilities. • Increase the capacity of public health workers to manage climate-related health risks 2. Public Health Programs: • Develop programs to address climate-related health issues like heat stress and vector-borne diseases. • Promote community health education and awareness. • Provide easy access to public water points 3. Emergency Response: • Strengthen healthcare systems' capacity for emergency response. • Implement early warning systems for climate-related health risks. • Instituting emergency protocols, such as evacuating tropical or sandstorm early warnings. 4. Mental Health: • Provide mental health support for communities affected by climate change. • Develop programs to build community resilience and well-being. 5. Setting up monitoring procedures.
Civil Protection & Emergency		1. Early Warning Systems: • Implement advanced early warning systems for natural disasters. • Use technology to provide real-time information and alerts to communities. 2. Disaster Preparedness: • Develop and regularly update disaster preparedness plans. • Conduct community training and drills for emergency response. 3. Infrastructure Resilience: • Strengthen critical infrastructure to withstand extreme weather events. • Implement flood defenses and storm surge barriers. 4. Recovery and Rehabilitation: • Develop rapid response and recovery plans for post-disaster situations. • Provide support for rebuilding and rehabilitation efforts.

Tourism		1. Sustainable Tourism: • Promote eco-friendly and sustainable tourism practices. • Develop guidelines for tourism operators to reduce their environmental impact. 2. Climate-Resilient Infrastructure: • Invest in climate-resilient tourism infrastructure. • Protect natural and cultural heritage sites from climate impacts. 3. Community Involvement: • Engage local communities in sustainable tourism initiatives. • Promote community-based tourism that supports local economies. 4. Adaptation Strategies: • Develop strategies to diversify tourism offerings to reduce vulnerability to climate impacts. • Implement measures to protect coastal and natural tourism attractions.
Education		1. Climate Education Programs: • Integrate climate change education into school curricula. • Develop educational materials and resources on climate resilience and sustainability. 2. Community Outreach: • Conduct public awareness campaigns on climate risks and adaptation strategies. • Promote lifelong learning and community education programs. 3. Research and Innovation: • Support research on climate change impacts and adaptation solutions. • Foster innovation and the development of new technologies for climate resilience. 4. Capacity Building: • Provide training and capacity-building programs for educators, students, and community leaders. • Promote collaboration between educational institutions and climate organizations.
ICT (Information & communication technologies)		1. Smart Infrastructure: • Implement smart grids and energy management systems. • Use IoT (Internet of Things) devices to monitor and manage energy use in real-time. 2. Data Analytics: • Use big data and analytics to predict and manage climate risks. • Develop platforms for sharing climate-related data and information. 3. Communication Systems: • Enhance communication systems for emergency response and early warning. • Use social media and mobile apps to disseminate information and alerts. 4. Digital Solutions: • Promote digital tools and apps for resource management and climate adaptation. • Support the development of ICT solutions for monitoring and mitigating climate impacts.
Other		
TOTAL	0	

Annex 7 : Description of Actions

ANNEX 3.6 - Indicators for Adaptation			
1)	Type of action	Mitigation Adaptation Access to Energy	
2)	Title of the action		
3)	Origin of the action	1- Local authority 2- Covenant coordinator or supporter 3-National 4-Regional 5-Mixed 6-Other	
4)	Responsible body		
5)	Short description		
6)	Implementation timeframe	Start:	End:
7)	Implementation status		
8)	Stakeholders involved	Select the stakeholders related to this action: 1-National government / agency(ies) 2- Sub-national governments(s) and/or agency(ies) 3-Business & private sector 4- Trade unions 5- Academia 6-Education sector 7-NGOs & civil society and 8 Citizens	
9)	Total implementation costs	€ or local currency	
10)	Source of funding	- Local authority's own resources - Regional funds and programmes - National funds and programmes - EU funds and programmes - Public-private partnerships - Private partnerships Other	
11)	Investment costs	€ or local currency	
12)	Non-investment costs	€ or local currency	

A. Mitigation							
13)	Sector	Buildings	Public lighting	Transport	Waste	Electricity Production	Other
	Tool / Area of intervention:	- Please select from below: - Building envelope - Renewable energy for space heating and hot water - Energy efficiency in space heating and hot water - Energy efficient lighting systems - Energy efficient electrical appliances - Integrated action (all above) - Information and Communication Technologies - Behavioural changes Other	Please select from below: - Energy efficiency -Integrated renewable power -Information and Communication Technologies Other	Please select from below: - Cleaner/ efficient vehicles - Electric vehicles (incl. infrastructure) - Modal shift to public transport - Modal shift to walking & cycling - Car sharing/ pooling -Improvement of logistics and urban freight transport - Road network optimization - Mixed use development and sprawl containment - Information and Communication Technologies - Eco-driving	- Waste & Waste water - Solid-waste Management Transportation for Solid Waste	- Renewable Energy - Wind power -Photovoltaics - Biomass Power plant - Combined Heat and power - Smart grids - Other	

	Policy instrument:	Please select from below: - Awareness raising / training - Energy management - Energy certification / labelling - Grants and subsidies - Third party financing. PPP - Public procurement - Building standards - Land use planning regulation - Not applicable - Other	Please select from below: - Energy management - Energy suppliers' obligations - Third party financing. PPP -Public procurement -Not applicable - Other	Please select from below: - Awareness raising/training - Integrated ticketing and charging - Grants and subsidies - Road pricing - Land use planning regulation - Transport / mobility planning regulation - Public procurement - Voluntary agreements with stakeholders - Not applicable - Other	Please select from below: -Awareness raising - Third party financing. PPP - Land use planning - Other	- Energy Suppliers Obligations - Grants and Subsidies - Third party financing - PPP Public Procurement - Building standard - Land use planning - Not applicable - Other	
14)	Estimated impacts						
15)	Energy savings (MWh/a):						
16)	Renewable energy production (MWh/a):						
17)	CO2 reduction (t CO2/y):						
18)	Vulnerable population group(s) targeted	- Women and girls - Children - Youth - Elderly - Marginalized groups - Persons with disabilities - Persons with chronic diseases - Low-income households - Unemployed persons - Persons living in sub- standard housing - Migrants and displaced people - Other					

19)	Policy instrument:		€	
20)	Estimated impacts		years	
21)	Energy savings (MWh/a):		%	
22)	Renewable energy production (MWh/a):		full-time equivalent	

B. Adaptation						
23)	Climate hazard(s) addressed					
24)	Sector(s)					
25)	Outcome(s) reached					
26)	Vulnerable population group(s) targeted					

27)	Avoided cost		€	
28)	Life expectancy of the action			
29)	Return on Investment		years	
30)	Jobs created		%	

Adaptation						
Goal	Unit (% or other)	Target value	Target year	Base year value	Base Year	Main climate hazards addressed

REFERENCES

The World Bank Group, Middle East & North Africa Climate Roadmap: Driving transformational climate action and green recovery in MENA, 2021. https://thedocs.worldbank.org/en/doc/6f868d4a875db3ef23ef1dc747fcf2ca-0280012022/original/MENA-Roadmap-Final-01-20.pdf

First Climate: Solutions for Corporate Climate Action - Start your Net Zero Journey with First Climate today! 2024. https://www.firstclimate.com/?lang=en&gad source=1&gclid=Cj0KCQjww5u2BhDeARIsALBuLnMWg7vvFo5rqkrdCalB1PvAYEjCY4l3aUGKE8gf3fKHlZndHL04rawaAsWMEALw_wcB

Raf Tuts, Robert Kehew: UNDP Guiding Principles for City Climate Action Planning, 2015. https://unhabitat.org/guiding-principles-for-city-climate-action-planning.

Sabine Saad, Chawki Lahoud, Marwan Brouche, Mohamed Hmadi, Mazen Ghandour, Adel Mourtada: Advanced tool for elaborating a sustainable energy and climate action plan at municipalities level, 2021. https://www.sciencedirect.com/science/article/pii/S2352484721008556

Rivas, S., El-Guindy, R., Palermo, V., Kona, A. and Bertoldi, P., Guidebook: How to develop a Sustainable Energy and Climate Action Plan (SECAP) in the MENA Region, European Commission, 2018.

Bastos, Joana; Monforti-Ferrario, Fabio; Melica, Giulia: GHG Emission Factors for Electricity Consumption. European Commission, Joint Research Centre (JRC), 2024.

Lo Vullo, E., Palermo, V., Rivas, S., Monforti-Ferrario, F. and Bertoldi, P., Global Covenant of Mayors in the MENA region: how to set the 2030 emission reduction targets according to the Nationally Determined Contributions, 2021.

UNDP, UN-Habitat and the University of Southern Denmark: Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners, 2015.

United Nations Development Programme (UNDP), World Resources Institute (WRI) 2020.

Enhancing NDCs: A Guide to Strengthening National Climate Plans by 2020

NDC Partnership: Kristen Hite, Richard Waite, Rebecca Carter, Laurel Pegorsch, Thomas Damassa and Rebecca Gasper NDC Enhancement: Opportunities in Agriculture, 2019.

NDC Partnership, Ichiro Sato, Paige Langer and Fred Stolle: NDC Enhancement: Opportunities in the Forest and Land-use Sector, 2019.

NDC Partnership, Taryn Fransen, Ichiro Sato, Kelly Levin, David Waskow, David Rich, Sadya Ndokoand Julie Teng Enhancing NDCs: A Guide to Strengthening National Climate Plans, 2019

Kelly Levin, David Rich, Dennis Tirpak, Heather McGray, David Waskow and Yamil Bonduki (UNDP) Designing and Preparing Intended Nationally Determined Contributions (INDCs), 2015

PFES, Ensuring Project Schedule Adherence with the Baseline Execution Index: Kaylyn Mickelson, Stephen Taipala, 2024. https://www.pfes.com/post/bei-schedule-adherence

Steve Lojuntin: Method to identify Building Energy Index BEI, 2013. https://www.slideshare.net/slideshow/method-to-identify-building-energy-index-bei/21337397

European Investment Bank (EIB): Project Carbon Footprint Methodologies for the assessment of project greenhouse gas emissions and emission variations, 2023. https://www.eib.org/attachments/lucalli/eib_project_carbon_footprint_methodologies_2023_en.pdf

Central and Eastern Sustainable Energy Union CEESEU: Creation of baseline emission inventories and climate risk & vulnerability assessment for 23 municipalities, 2023. https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5ee053584&appId=PPGMS

Clima-Med, EU: Recommendations for Climate Action Coordination Strategy (CASs) in seven countries. https://www.climamed.eu/project-documents/clima-med-cass/

Indiana University, Environmental Resilience Institute: Greenhouse gas inventories: Measuring local emissions to guide customized action plans 2017. https://eri.iu.edu/tools-and-resources/fact-sheets/greenhouse-gas-inventories.html

European Environment Agency: Climate and Energy in the EU, Greenhouse Gaz Emission Inventory: 2028. https://climate-energy.eea.europa.eu/topics/climate-change-mitigation/greenhouse-gas-emissions-inventory/intro

The World Bank: Improving Municipal Management for Cities to Succeed An IEG Special Study,2009.

https://ieg.worldbankgroup.org/sites/default/files/Data/reports/Municipal_eval.pdf

European Environment Agency: Greenhouse gas emissions from energy use in buildings in Europe 2023

https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emissions-from-energy

IPCC Sixth Assessment Report Working Group III: Mitigation of Climate Change: Climate Change Chapter 9: Buildings 2022 https://www.ipcc.ch/report/ar6/wg3/chapter/chapter-9/

Sangji Lee and Lisa Baumgartner (UNDP): How Just Transition Can Help Deliver the Paris Agreement, 2024 https://ndcpartnership.org/knowledge-portal/climate-toolbox/how-just-transition-can-help-deliver-paris-agreement

UNFCCC - Network of Regional Governments for Sustainable Development: Subnational governments at the forefront of climate action, 2010. https://seors.unfccc.int/applications/seors/attachments/get_attachment?code=6DTDMM8OJPR1X4Q3ILP6CAZZB3HTGI32

United Nations Development Programme: The Climate Dictionary: An Everyday Guide to Climate Change, 2024 https://climatepromise.undp.org/news-and-stories/climate-dictionary-everyday-guide-climate-change?fbclid=IwAR0WT8WJ3lUREWcRjhsicaPJPgJUFRytB9egFYSCXa0yyl7rLsb0VS-S6cs

Thibaud Voïta: Engaging Subnational Governments in Climate Action Lessons Learned from the NDC Partnership Support Unit, 2020. https://ndcpartnership.org/sites/default/files/2023-09/engagling-subnational-governments-climate-actioninsight-briefmarch-2020.pdf

OECD, Tadashi Matsumoto, Isabelle Chatry and Alexandre Banquet: From Ambition to Action: Accelerating Local Climate Action and Resilience, 2024. https://oecdcogito.blog/2024/03/28/from-ambition-to-action-accelerating-local-climate-action-and-resilience/

Clima-Med, EU: Clima-Med SEACAPs for 69 cities in the South Mediterranean region https://www.climamed.eu/project-documents/seacaps/

EC (European Commission), 2011. Guidelines for Project Managers: Making vulnerable investments climate resilient.

EEA (European Environment Agency), 2012a. Urban adaptation to climate change in Europe – Challenges and opportunities for cities together with supportive national and European policies. Report N. 2/2012. EEA, Copenhagen.

Lebel L., Li L., C. Krittasudthacheewa et al 2012. Mainstreaming climate change adaptation into development planning. Bangkok: Adaptation Knowledge Platform and Stockholm Environment Institute.

A digital copy of this document is available on the project website: www.climamed.eu

Clima-Med, Acting for Climate in South Mediterranean, is an EU-funded project implemented by a DAI led Consortium as part of the activities of the European Union’s project for ENP South Countries EUROPEAID / 139067 / DH / SER / MULTI.

Concept & Design
Clima-Med

Photography:
Khaoula Lajali
Wadih Chehaibar
Ahmed Ayyach
Additional pictures: Courtesy of the Clima-Med partner municipalities

Design:
Purple Advertising Agency

Translations:
Big Dreams Studios for French
Sara Zaghloul for Arabic

Published by Clima-Med, Acting for Climate in South Mediterranean, July 2025

Covenant of Mayors Mediterranean

Clima–Med
Acting for Climate in South Mediterranean

Funded by the European Union

DAI
Shaping a more livable world.

VISIT US:

www.climamed.eu

www.com-med.org

Follow us on our
social media channels at:

@Clima-Med
@covenant of mayors mediterranean

Clima-Med
Covenant of Mayors Mediterranean