



Strategie e misure di adattamento al cambiamento  
climatico nella Città Metropolitana di Milano

## Final report



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**Final Report**  
Covering the project activities from 03/09/2018 to 30/09/2021

### Technical Part

Reporting Date  
<**31/09/2021**>

LIFE PROJECT NAME or Acronym  
<**LIFE METRO ADAPT**>

#### Data Project

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#### Data Beneficiary

<b>Name Beneficiary:</b>	Città Metropolitana di Milano
<b>Contact person:</b>	Mr Emilio De Vita (Project Coordinator) Mrs Cinzia Davoli (Project Manager) Mrs Marina Trentin (co-Project Manager)
<b>Postal address:</b>	Viale Piceno, 60 – 20129 Milano - Italy
<b>Telephone:</b>	+39-02-7740286/3040 (Mr De Vita) +39-02-77403060/7598 (Mrs Davoli) +39-340-6123564 (Mrs Trentin)
<b>E-mail:</b>	<a href="mailto:e.devita@cittametropolitana.milano.it">e.devita@cittametropolitana.milano.it</a> <a href="mailto:c.davoli@cittametropolitana.milano.it">c.davoli@cittametropolitana.milano.it</a> <a href="mailto:marina.trentin@ambienteitalia.it">marina.trentin@ambienteitalia.it</a>
<b>Project Website:</b>	<a href="http://www.lifemetroadapt.eu">www.lifemetroadapt.eu</a>

**Instructions:**

Please refer to the General Conditions annexed to your grant agreement for the contractual requirements concerning a Mid-term/Final Report.

Both Mid-term and Final Technical Reports shall report on progress from the project start-date. The Final Report must be submitted to the Agency no later than 3 months after the project end date.

Please follow the reporting instructions concerning your technical report, deliverables and financial report that are described in the document [Guidance on how to report on your LIFE 2014-2020 project](#), available on the LIFE website. Please check if you have the latest version of the guidance as it is regularly updated. Additional guidance concerning deliverables, including the layman's report and after-LIFE plan, are given at the end of this reporting template.

Regarding the length of your report, try to adhere to the suggested number of pages while providing all the required information as described in the guidance per section within this template.

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## 2. List of keywords and abbreviations

ALDA Association des agencies de la Democratie Locale

AMBIT Ambiente Italia s.r.l.

ASO Administrative and Secretary Office

CAP CAP Holding S.p.A.

CMM Città metropolitana di Milano

CKN Climate Knowledge Network

EGEOS e-GEOS S.p.A.

EPM Executive Project Manual

KOM Kick Off meeting

LAL Legambiente Lombardia Onlus

PA Partnership Agreement

PGT Piano di Governo del Territorio (municipalurbanplan)

PMT Project Management Team

PTM Piano Territoriale Metropolitano (Metropolitan Territorial Plan)

PTUA LombardyRegionTerritorial Plan

SC Steering Committee

SECAP Sustainable Energy and Climate Action Plan

SuDS Sustainable Drainage Systems

CC Climate Change

### **3. Executive Summary**

#### **C1. Climate analysis and vulnerability assessment at metropolitan level**

Maps of the urban heat islands, and of the vulnerability in socio-economic and agricultural terms were created. In parallel, the “Guidelines for climate analysis and vulnerability assessment at the metropolitan scale” have been prepared and implemented for defining vulnerabilities and priorities of intervention: these Guidelines have been drawn up in order to provide principles and useful references for the Metropolitan City of Milan, its municipalities or for other metropolitan areas, for the analysis of thermal anomalies in the sector urban and agricultural and the respective vulnerability assessment. In addition, these guidelines provide a first original analysis of the phenomenon of run-off in urban areas, trying to identify all the factors that determine the problematic nature of this complex phenomenon.

#### **C2. Evaluation and mainstreaming of climate change adaptation measures in metropolitan planning**

CMM identified the PTM (Metropolitan Territorial Plan) as the main tool for mainstreaming CC adaptation into local level of land management and used it as instrument to light a dialogue with stakeholders. The PTM drafting process was carried out between 2019 and went on until the first quarter of 2021. Following the progress of the drafting of the PTM and the definition of the time frame for its adoption and approval, the timing for the conduct of Action C2 has been revised by adapting it to the PTM calendar, in order to accompany the process and increase the effectiveness of the deliverables and milestones of the project action.

The PTM – with the support of the project - dedicates a whole section of its normative document to environmental emergencies and creates a distributive fund to finance adaptation measures at metropolitan and supra-municipal level, sets up legal standard and rules for resilience measures, and a policy framework for all the local Authorities who need to comply with adaptation measures.

A Climate Knowledge Network was set up, involving the municipalities and research bodies.

#### **C3. Overcoming uncertainty and barriers to adoption of Nature-based solutions (NBS) in urban context**

Practical guidelines have been created to support the dissemination of NBS at the local level, together with a catalogue including 20 technical NBS schemes. The final deliverable of the NBS guidelines and catalogue were made available in time for supporting the first version of the Metro Adapt Platform, which has been integrated in the institutional site and directly linked with PTM website. The platform integrates existing data available in the DeCiMetro territorial database with new data and information coming from the vulnerability analysis and the tools supporting the NBS development. CMM developed this system on its own resources. This delayed the delivery of the platform but allowed the possibility of a full internal management.

2 NBS feasibility studies concerning adaptation measures to be implemented in the Municipalities of Parabiago and Buccinasco were delivered and three technical workshops were carried out in order to engage technical actors in the multiple benefits of NBS and SuDS as adaptation measures.

#### **C4 Enhancing bottom-up initiatives and developing demonstrative measures**

The organization of raising awareness events focused mainly on theatrical performances, reaching over 1000 participants online and offline. The performances were very successful, dealing with climate change issues with very high scientific approach and with an emotional one typical of the theatre. Furthermore 7 thematic seminars were realized, targeting a more general but concern public of citizens, spanning among different ages and different technical competences, with the aim of creating a wide awareness base among active groups of citizens.

The design and realisation of the Solaro and Masate Parking new drainage systems was realized, and the building sites were documented by two videos, also used to show technicians and interested stakeholders the NBS approach and the peculiarities of each site. The completed demonstrative sites were at the centre of site-visits and were used as examples in the technical workshops (see Action C3) and for hosting two out the 7 above-mentioned thematic workshops.

#### **C5 Replicability and transferability of the project results**

This action is one of the most subject to change because of the COVID pandemic, and a “Metro Adapt COVID Resilience Plan” was drafted and put in place during 2021.

Thematic workshops were dedicated to the local networks of Legambiente, tackling the climate change communication and the adaptation solutions themes.

River Contracts were supplied with LIFE Metro Adapt documents and strategic guideline will be integrated in the River Contracts’ Strategic Plans, while ERSAF decided to include the NBS technical guidelines and catalogue in the desealing call for proposal that was promoted during summer 2021.

Thanks to the experiences gained during the Life Metro Adapt, CAP projects have been replicated in a car park in Paullo and in Varedo, with an added extension of more than 1 hectare.

Three mutual learning workshops were held among metropolitan cities and public entities, reaching over 200 participants. The participation to conferences and events supported the dissemination of Metro Adapt products through the “CREIAMO PA” learning platform and other public events dedicated to the training of Public Administration officers and Metropolitan Areas. Three online webinars were held with the aim of transferring the project results at EU level, reaching 242 participants.

A practical handbook describing the project model was produced and distributed through the project website and the project newsletter.

#### **D1 Monitoring of the impact of the project actions**

Environmental and socio-economic data, indicators and derived maps are available through a dedicate section within the METRO ADAPT webpage and Platform. In order to facilitate data collection, an excel file was elaborated, mainly on Increase of Nature Based Solution in order to reduce peak flows; Climate change mainstreaming and capacity building; Communication, dissemination, awareness raising. The monitoring file collected information about the implementation of works in the two demonstrative sites, all the events



organised by the Metro Adapt team and the communication and exploitation activities attended by the project's partners has been regularly uploaded. Selected KPIs was uploaded on the portal in July 2019 and validated by EASME. In the monitoring excel file KPIs values are reported, together with a synthetic assessment about the level of implementation. Social and health benefits analysis mainly focused on the perception about Climate Change Adaptation measures. Questionnaires have been targeted to policy makers, technicians, CKN.

## **E1 Communication and dissemination of results**

The website registered a significant number of visitors which remained quite steady over the months. 13 newsletters were sent and published on the project website, while 13 articles were published on newspapers and magazines. Many different tools were deployed to communicate and disseminate the project's results: 26 events and exhibitions were organized by Metro Adapt: 10 local information events (theatrical performances) reaching about 1318 people, 8 local thematic seminars (estimating 406 participants reached), 1 local photo contests, while partners attended 18 meetings and conferences at national level and 15 at international level. 4 events were organized in Milan with the participation of a total 222 people. Participation in dissemination and networking events were useful to create synergies and interesting contacts with projects, international organizations, public entities, representatives of the private sectors, institutions and key stakeholders who could be interested in the project focus and thematic. Dissemination materials were set up like 5 different videos (also complying with difficulties rose with the COVID-19 pandemic), noticeboards, leaflets, layman's report, setting up of social media profiles, press releases for the main events, articles designed for scientific and general communication, online events, off line events in Milan, final conference.

The project contributed its practice to the European Climate Adaptation Platform.



## 4. Introduction

Climate-related problems/issues addressed by METRO ADAPT project are focused on some of the typical climate problems to be addressed in metropolitan urban areas, in particular heat waves and urban heat islands, and local flooding due to runoff excess. The effects of heat waves in the urban structure of a wide territory like the Metropolitan Area of Milan it is amplified by the dense built-up areas (about 40.5% of the whole territory), and by anthropogenic factors such as traffic and other human activities. A preliminary pilot study using nocturnal multi-temporal thermal satellite images to depict temperatures distribution patterns inside the town of Milan showed that during the heat wave registered in July 2015, 108,305 citizens > 65 years were living in the hottest areas with a night temperature > 26.5 °C (see [https://www.cittametropolitana.mi.it/Life\\_Metro\\_Adapt/servizi/index.html](https://www.cittametropolitana.mi.it/Life_Metro_Adapt/servizi/index.html) and specifically <http://desk.cittametropolitana.mi.it/superset/dashboard/life/>). Moreover, the whole Metropolitan Area of Milan is prone to flood risk, due both to expected increase of peak flow of the Olona and Seveso rivers, and to the runoff generated by the compact, not permeable urban fabric. Almost half of the territory of the Metropolitan City of Milan is included in the “high” vulnerability class (class A). The other half is anyway included in the “medium” vulnerability class.

In order to give a solution to those problems, Metro Adapt proposed to Mainstream adaptation strategies at local level, creating a common, well-structured governance, with the aim of improving the chances for local authorities to exploit a potential cost-effective adaptation, shaping and translating national and regional climate change policies to the local context. Local governments are in a unique position to engage local stakeholders and draw punctual responses to local climate-related vulnerabilities and risks. On the other side, individual municipalities do not always have the necessary resources (scientific and technical knowledge, administrative competences, funding, etc.) to deal with climate problems. The role of Città Metropolitana di Milano (CMM, Milan Metropolitan Authority), covering 133 municipalities including the city of Milan, is fundamental in setting a comprehensive strategy for the wide and whole territory, enhancing the mainstreaming of adaptation measures at all the local levels and coordinating all the different planning and operative tools.

Demonstrative pilot projects, feasibility studies and technical guidelines, together with different kinds of awareness-raising activities, were used to promote the deployment of Nature Based Solutions (NBS) in the Milan Metropolitan area as measures of adaptation to Climate Change effects, supporting urban planners and policy makers in establishing the priorities about climate adaptation activities.

The description of the technical solutions proposed by METRO ADAPT project were collected through an operational platform providing functionalities for supporting urban planning and integrating information coming from different sources: vulnerability maps, technical guidelines, case studies, financial guidelines.

Adaptation strategies and plans processes need also a strong commitment of citizens and in general of non-governmental actors. Citizens of the metropolitan city - in an organized manner (associations, committees, informal groups) and individually – were then engaged through different communication approaches spanning from simple dissemination workshops, up to the more innovative and engaging theatre show, using different languages like photography, storytelling, animated video, journalism.

The NBS feasibility studies and the demonstrative facilities in Masate and Solaro highlighted the technical constraints that have to be considered in the design process (e.g. different soil permeability conditions in the Northern and Southern parts of the Metropolitan Area) and provided examples of how to design a



system in site specific conditions, including the key technical details. The demonstrative realisations and the feasibility studies were also used as a support during the training workshops, that allowed also a peer exchange of experience among technicians and researchers from the private and public actors, focusing on strengths and criticalities that could come up during the realization of NBS and SuDS, and raising practical ways to overcome them or stimulating new legal approaches to assure impacts and benefits.

## 5. Administrative part

The management process has been described in the Executive Project Manual that was shared and discussed with all the partners during the kickoff meeting (30/10/2018). Then a Project Management Chart which contains all the members of Project Management Team (PMT), Steering Committee (SC) and Administrative and Secretary Office (ASO) was draft and shared with all the partners during the first project monitoring visit (25/02/2019).

The First Steering Committee with all project partners was organized on 15/07/2019.

At least once a quarter the project representatives compare themselves on the project's progress, to share the progress of the activities, any problems, delays or the need for changes to the project and analyse the possible solutions. Some meetings, especially those among Milan partners CMM, AMBIT, CAP and LAL, were held physically, the others preferably through telephone calls and videoconferences in line with the rules in Executive Project Manual (art. 1.1) to reduce carbon footprint. In cases where, for the development of Action C1, the presence of EGEOS representatives at the headquarters of CMM was indispensable, the cheapest means of transport were used for the journeys, favouring those with less environmental impacts (trains and city's public transport).

CMM, the Coordinating Beneficiary, supported by AMBIT in management activities, maintained close relationships with each partner, through periodic updates, bilateral meeting and phone calls and e-mail exchanges. All the partners actively participated to the meetings, with a strong and mutual collaboration developed since the beginning of the project's activities.

In order to share all the main documents, keep every partner constantly updated on the project and reduce carbon footprint, it was decided to create two shared spaces on the web:

- the first one is hosted by the CAP FTP space and is able to host all the different working documents produced, including "big size" file like maps, videos or docs with images and photos <https://owncloud.capholdingtecnologie.it/index.php/s/P9i3ggpUbl6uVVD/authenticate>
- the second one is a private area of the Metro Adapt web site where administrative and financial documents can be uploaded by each partner <http://www.lifemetroadapt.eu/myspace/>

The Executive Project Manual, in an updated version of March 2019 (annex F1\_D01), gives internal rules for all the partners to reduce carbon footprint of the project (see art. 1.1 of EPM).

CMM assured the project management, coordinating the partners' activities and regularly monitoring the progress of the project. In order to keep all the partners updated about the project, CMM collect periodic reports (every 3 months) from each partner and, with the support of AMBIT, reports the main information on an excel file table called "avanzamentoprogetto" summarising the activities related to each deliverable and/or milestone. The updated file is regularly uploaded on the FTP. The financial management of the project has been also ensured, through regular phone calls, e-mails and in the occasion of the project meetings, requiring all partners to submit all financial documents and timesheets, sending them through PEC (during the first period of the project) and regularly uploading them on the Private area of the website).

The Communication between the EASME/CINEA and the Monitoring team followed the LIFE guidelines, and no relevant comments are to be pointed out.



No amendments to the Grant Agreement have been done. The Kickoff meeting was held on 30/10/2018.

The Executive Project Manual (annex F1\_D01) was discussed with all the Partners during the KOM.

The Partnership Agreement (PA), written by CMM, was signed by all the beneficiaries on 04/12/2018. On the same date the report of the KOM has been concluded and distributed (annex F1\_D02). The excel file “avanzamento\_progetto” for monitoring the project development was produced by AMBIT in December 2018 (annex F1\_D03).

CMM drafted the Project Management Chart which contains all the members of Project Management Team (PMT), Steering Committee (SC) and Administrative and Secretary Office (ASO).

After the 30/09/2021 the SC adopted an agreement of Future cooperation between partners that contains AfterLife Plan. This Plan identifies follow-up strategies and actions.

## 6. Technical part

### 6.1. Technical progress, per Action

#### Action C1 - Climate analysis and vulnerability assessment at metropolitan level

Foreseen start date: September 2018

Actual start date: October 2018

Foreseen end date: December 2019

Actual end date: July 2020

##### C1.1 Vulnerability assessment

The Action started with the preparation of the first deliverables envisaged by the project: *“Report on state of the art, user requirements, methodology, input data and products specifications”* C1\_D01. This report describes the state of the art focused on the assessment of heat islands impacts and of the most vulnerable situations to this phenomenon, and on the most used methods to evaluate the relationship between changes in land use, in particular the increase in impervious soil surfaces, and temperature variations. It also provides useful indications regarding the "Metropolitan Territorial Plan" about urban flood risk management and agricultural vulnerability. Finally, based on the user's needs (CMM), it defines a preliminary hypothesis on the input data and methodologies to realize the products with the specific requests.

This analysis was useful to continue the next work. In fact, following the analyses carried out on the data, methods and requirements described in the *“Report on state of the art ( ...)”*, algorithms have been developed leading to the creation of software that helps in the realization of the map of the urban heat islands, and of the vulnerability analysis in socio-economic and agricultural terms. The detailed definition of danger and vulnerability maps for urban flooding have been developed with the collaboration of other partners. At the end of this actions have been concluded the reports: *“Times series of Heat Maps”* C1\_D02 and *“Time series of Vulnerability Maps and data access tools”* C1\_D03).

To complete the last purely technical part, relating to sub-action “C1.1 Vulnerability assessment” the deliverables *“Final Report including analysis of Heat Maps, vulnerability maps, impact from Copernicus Imperviousness and land-use change product, urban structure analysis”* C1\_D04 was completed.

After the closure of the first phase of the analysis, we have confronted with the Politecnico di Milano and the IUAV of Venice, two CMM partner universities in 2 projects funded by Fondazione Cariplo related to climate change, possible green and mitigation actions to implement in productive and peripheral areas. In addition, we have been in contact with Fondazione OsservatorioMetereologico Duomo Milano, which deals with scientific climatological research. Thanks to these exchanges we have integrated the analysis produced during the LIFE project by including other indicators such as Albedo, Imperviousness, Sky view factor, NDVI etc. in order to improve the reading of the territories in a test area for each homogeneous zone.

In addition, CMM has also developed a RunOff model, comparing soil sealing with precipitation, to highlight the correlation with runoff. With the contribution of the CAP Group, information on the flood phenomena detected was also included.



EGEOS operational Service Platform, AWARE, developed at its own costs, is available for the project, to allow users to access and exploit geospatial contents from Heat Maps and Vulnerability Maps deriving indicators, reports and actionable information on the METRO ADAPT AOI. Motivated also by the METRO ADAPT project objectives and results, EGEOS is prototyping at its own costs a customization of the AWARE platform, specific for Urban Area. As completed, it will be available for the project as well. (<http://share.egeos-services.it/platforms-bigdata/itemlist/category/100-aware.html>)

The Action was closed with milestone C1\_M01: *“Finalization of vulnerability analysis”*

### C1.2 Guidelines

In parallel, the *“Guidelines for climate analysis and vulnerability assessment at the metropolitan scale”* C1\_D05 have been implemented: these Guidelines have been drawn up to provide principles and useful references for the Metropolitan City of Milan, its municipalities or for other metropolitan areas, for the analysis of thermal anomalies in the urban and agricultural sectors and the respective vulnerability assessment.

In addition, these guidelines provide a first original analysis of the phenomenon of run-off in urban areas, trying to identify all the factors that determine the problematic nature of this complex phenomenon. In this text standardized procedures are reported to facilitate the chain of information between the data owners and the metropolitan city.

The document, after a first explanatory introduction on climate change, mitigation measures and adaptation and the territorial context, briefly describes the products that have been produced and the data in necessary inputs. The way the data is used, its applicability and its potential use are then detailed.

In particular, the use is made available in open mode and free of charge through an online platform created ad hoc for this project and hosted on the institutional portal of Metropolitan City of Milan.

With such a tool, all users: municipalities, professionals, researchers will be able to access the products, understand how they can be updated and when they need to be updated, for what purposes they can add value.

CMM thus developed a platform [www.cittametropolitana.mi.it/Life\\_Metro\\_adapt/index.html](http://www.cittametropolitana.mi.it/Life_Metro_adapt/index.html), integrated in the institutional site, in order to make available the vulnerability maps elaborated by the project, containing information disaggregated at municipal level, to all municipalities that usually visit the site. Additional land use and census dataset have been integrated in the platform in order to support the municipalities subscribing the New Covenant of Mayors for Climate and Energy and willing to develop the baseline review supporting the Sustainable Energy and Climate Action Plan (SECAP), according to the expected milestone: *“Datasets usable for the Covenant of Mayors for Climate & Energy made available to all 133 CMM municipalities”* (C1\_M02).

This platform, in fact, allows everyone, free of charge and without the need for software, to navigate through the product analysis and create real packages of information about climate change.

### C1.3 Training

As part of the training actions, 3 webinars were held in June, using an online platform, each of which dedicated to a different audience that required an ad hoc remodelling of the illustrative material and of the teacher's communication, focusing attention on different aspects of the project depending on the type of auditing.

Participation and involvement in training seminars was high (as overall 120 participants were reached) as was active participation, with questions and further requests for clarification. In addition to the immediate positive feedback, in September the participants were contacted by email and, to those who requested it, additional information and illustrative material were provided.

This was a real and important step towards the replicability and transferability of the project results (see Action C5). The different and specific agendas, presentations and materials accompanying the webinars, is reported in the *"Report about Training activities"* (C1-D06). The Guideline presentation at the webinar closed the C1\_M03: *"Guidelines for climate analysis and vulnerability assessment at the metropolitan scale"*. All the material was uploaded to the MetroAdapt Platform, in a specific section, and from there it can be consulted and downloaded.

## **Action C2 - Evaluation and mainstreaming of climate change adaptation measures in metropolitan planning**

Foreseen start date: January 2019

Actual start date: January 2019

Foreseen end date: March 2020

Actual end date: September 2021

### C2.1 Evaluation of the mainstreaming of adaptation measures in the PTM setting up a climate knowledge network

CMM, with the cooperation of AMBIT, realized the Review of all the relevant policies, plans, programs and measures (annex C2\_D02) mapping the main actors and the ongoing strategies and policies on climate change adaptation at national, regional and metropolitan level (including the most relevant local projects and initiatives). The delivery of the document, as declared in the first progress report, shifted to the 31.07.2020.

AMBIT prepared communication tools for the awareness raising activities (annex C2\_D01) consisting in 3 different ppt presentations about adaptation measures and NBS in urban areas, which were presented during the first and second thematic seminars (action C4.1) and during the Metro Adapt presentation to local and regional stakeholders (action E1.2).

This tools stems from the need to communicate how climate change adaptation measures have been developed in the PTM within the Metro Adapt project. They have been addressed both to the population and to technicians and decision-makers in the municipalities of the Metropolitan City of Milan. The main



objective of the tools was to convey in an intuitive structure, in easy-to-understand language and through a user-friendly architecture, how the PTM, in its principles, objectives, up to the standards, contributes to providing an answer to the issues related to climate change.

### *Climate Knowledge Network*

The Climate Knowledge Network – Selected Committee is made up by Professors of Politecnico of Milan, Università degli Studi Milano – Facoltà Agraria, IUAV University of Venice, representatives of Municipality of Milan, Meteorological Observatory Milano Duomo, ENEA, Fondazione Lombardia per l'Ambiente (FLA), Regional Office for Agricultural and Forestry Services (ERSAF), Italian and International Association Landscape Ecology (SIEP-IALE).

The first meeting of the expert group was held on 23.05.2019 during the Metro Adapt presentation at local and regional level. An important aspect of the CKN is correlated precisely to the involvement of the Municipalities Network in a participatory process aiming at sharing the climate change adaptation issues and the construction process of the PTM began at the end of 2018. The theme of climate change adaptation, inserted as a new priority of the PTM, along with the Metro Adapt project, was illustrated in 4 meetings on the territory, from 8th to 21th November 2018 (over 75 municipalities were reached on these occasions). Then the progress of the activity related to the climate change adaptation measures, also suggested by the CKN expert group, in the PTM was illustrated, together with all the themes of PTM developed, in 7 meetings organized on the metropolitan territory (one for each Homogeneous Zone) and 1 in the Municipality of Milan, from 14th November 2019 to 12th February 2020 (133 municipalities with 316 participants were reached on these occasions). In those occasions technical contribution was useful to create a better understanding of the adaptation urgency at local planning level. Metro Adapt was also presented to environmental and territorial authorities and other stakeholders on 18.12.2018 during the first Strategic Environmental Assessment (SEA) conference of the PTM and during the Final SEA Conference held in May 2020.

Those discussions and presentations were used to better understand the needs of local administration, policy makers and decision makers, in order to translate in an administrative way the technical issues. The experience and the continuous exchange with the CKN helped the construction of the PTM receiving information from parallel experiences that the components were carrying out on these issues and comparing the regulatory choices. In addition, through the interviews it was possible to focus on what type of engagement or agreement of municipalities was needed (see C2\_D04 Report on the assessment and enhancement of mainstreaming adaptation in the MNC and the municipal planning tools). The last meeting of the group took place on the 21th of September 2021, during the pre-COP26 days. The meeting was an exchange between some members of the Network from Research and local Authorities: the goal was to share the Nature-Based Solutions monitoring tool created by the LIFE Metro Adapt Project and to stimulate the creation of synergies among the participants, stating after the discussion how the “silos” approach should be overcome and a more interdisciplinary and interdepartmental approach should be adopted instead.

The online CKN is hosted on Metro Adapt platform and it consists in a section dedicated to studies, best practices, project experiences made by the Selected Committee and open to free navigation and downloading to all the visitors of the Metro Adapt platform. The Platform is online since March 2020.

The climate change adaptation measures developed in the PTM as part of the Metro Adapt project have been illustrated:

- on 16/09/2020 a webinar held to the municipal, provincial and regional authorities in Italy, organised by IFEL - Fondazione ANCI;
- in the review Urban Promo 2020 – Sezione “Obiettivi, strategie e azioni dei nuovi piani urbanistici”, on 18.11.2020;
- at “Forum Foreste: “Resilienza e forestazione urbana, la capacità di risposta delle città alla crisi climatica”, on 18.11.2020;
- in the webinar “Da Seven Suzuki a Greta Thunberg, come è cambiato il clima e la comunicazione”, on 26.11.2020;
- in the webinar entitled “The Metropolitan Territorial Plan” held on Wednesday 16 June 2021. It was the second meeting scheduled, within the cycle of 3 training sessions aimed at technicians of the Municipalities and the Metropolitan City of Milan, planned for the year 2021 in collaboration with the Foundation and the Order of Architects PPC of the province of Milan.

## C2.2 Enhancing the decision-making process for the implementation of adaptation measures

The PTM drafting process was carried out during the second part of 2019 and the first part of 2020 and it went on until the end of the administrative mandate (September 2021).

On February 2020 the first technical proposal of PTM was taken into account by the metropolitan mayor and was tabled for the second SEA Conference observations. On 29<sup>th</sup> July 2020 the PTM was adopted by the Metropolitan Council with approval n.14/2020.

The PTM of the Metropolitan City of Milan was approved by the Metropolitan Council in its meeting of 11<sup>th</sup> May 2021 with Resolution no. 16/2021 and became effective on 6<sup>th</sup> October 2021 with the publication of the notice of final approval in the Official Bulletin of the Lombardy Region - Announcements and Competitions Series n. 40, in accordance with the provisions of Article 17, paragraph of LR 12/2005.

All the materials about the legal document of adopted PTM is available at the following CMM web page: <https://www.cittametropolitana.mi.it/PTM/index.html>

PTM is one of the first territorial plans in Italy dedicating a whole section of its normative document to environmental emergencies and creating a distributive fund aimed at financing adaptation measures at metropolitan and supra-municipal level. Without the path of awareness (action C1) strategy (action C2), definition of actions (action C3) and communication/dissemination (action C4 and C5) Milan Metropolitan City would not have had the awareness, the tools and the staff to be able to respond to the challenge of climate change by even introducing these issues within its most important instrument of territorial and urban planning.

A territorial plan is a tool dedicated to drive and guide municipalities in drafting urban planning, addressing a target of policy makers, decision makers, urban designers, contractors and citizen. The PTM therefore provides rules to be followed by the municipalities and local administration in planning municipal levels and it is basically composed by technical reports, analytical maps highlighting vulnerabilities and priorities, and

prescriptive maps supporting local planning in tackling problems and enhancing local sustainable development. The coercive level of rules and maps is given from national and regional legislation.

Taking advantage from the Metro Adapt project, CMM was supported by a legal expert in defining the PTM climate change adaptation regulation and the creation of a fund dedicated to finance municipalities implementing adaptation measures. The legal expert, a researcher coming from the Università degli Studi dell'Insubria, gave legal/administrative assistance to the technical offices in drafting the enabling rules for climate change adaptation measures in the PTM. He also drafted the **compensatory measures supporting the municipalities in financing adaptation measures**. He was also responsible for drafting a model agreement for the municipalities willing at participating in the fund, focusing on the definition of the relationship between the parties and the use of the fund. (see C2\_M04 Evaluation of the setting up of a specific fund dedicated to finance municipalities for implementing adaptation measures)

The legal section dedicated to environmental emergencies of the PTM, contains guidelines and directives for municipal plans, aiming at the inclusion of specific parameters and rules for climate change adaptation in the Metropolitan area of Milan. At the local (municipal) level, the PTM works to ensure that the Local Masterplans (PGTs: Piano di Governo del Territorio) translate these guidelines and directives, in their regulations and sector plans/programmes (Green Plan, Urban Traffic Plan, Urban Mobility Plan, Building Regulations, etc.).

Criteria and rules are then oriented to a proactive urban planning towards climate change, being the Municipality the local authority most responsible for managing the local scale of master planning.

Article 31 paragraph 1 of the PTM Act provides the municipalities with some guidance on possible measures to be taken in the PGT. Municipalities are required to develop a study, in the most critical situations, to reduce heat anomalies in areas with night values above 3°C with reference to what is shown in PTM map n.8 in which are shown the results of heat island 15 analysis developed in Action C1. For the same areas, paragraph 2 of the same article, provides indications for interventions to mitigate daytime heat anomalies.

In addition to the measures to contrast the heat islands, the rules of PTM Act foresee the minimization of energy consumptions from not renewable energy sources and the minimization of emissions into the atmosphere calculated using a municipal balance, the reduction of per capita potable water consumption, the reuse of meteorological water, water plumbing invariance and project solutions, protection of the groundwater recharging areas.

The PTM also supports the coordination of a systemic approach to climate change adaptation through the different technical department of CMM, coordinating and integrating the different Sectors according to the topics of own competence and overcoming the usual "silos" approach (environment, energy, infrastructure, mobility and transport, parks, heritage, etc.).

For projects of supra-municipal importance, the PTM provides for specific agreements, and shall assist municipalities to pool their own resources for this purpose (such as a share of urbanization fees of metropolitan and supra-municipal land use interventions; municipal fund rights), including in the search for additional sources of funding from other entities (regional, national and European co-funding). This type of assistance is among those indicated at Article 11 of the PTM rules, for which territorial equalisation fund, created by the PTM also to finance adaptation measures at metropolitan and supra-municipal level, may be activated (See C2\_M04 Evaluation of the setting up of a specific fund).

The articles of Part II and Part III of the PTM Act pursue objectives of metropolitan and supra-municipal interest among which the adaptation measures (as defined by art. 11 of regional law n.12/2005) identified by CMM.

At the local level too, the discussion about the mainstreaming of climate change adaptation measures into local planning tools is becoming part of the agenda of frontrunners municipalities. For example, the Municipality of Milan, involved in the Climate Knowledge Network through its Resilience Office, drafted the Building Impact Reduction Index (called RIC) as an article of the new Building Rule.

Specific tools were dedicated to support the implementation of the PTM strategies at the local level. In particular, Guidelines explaining how to access existing funding opportunities at regional, national and EU level for implementing adaptation measures, and Legal standard and rules to be published and shared with European project coordination of metropolitan city and CMM municipalities.

Another very important tool for communicating plan content to municipalities was the Municipal Tool for local knowledge and adaptation actions (see C5\_OD02).

During the construction process of PTM and, based on the results of the analyses carried out by Action C1 and by other European projects, a map was dedicated to the metropolitan green networks: the PTM contains the design of a **Metropolitan Green Network (MGN)**, together with the definition of rules for its implementation to be used by the Municipalities. The project of MGN, besides of helping to restore rural, natural and wooded landscapes, defines the territorial areas with different features for taking action and funding priorities to mitigate the heat islands and the runoff. Based on the characteristics and criticalities of each area, project priorities and the specific measures to be taken have been identified.

Once the specific criticalities of the individual areas have been identified based on territorial contexts integrated with the results of the analysis of Action C1, the priority and 16 specific measures to be taken and those at supra-municipal and metropolitan level, for which the territorial equalisation fund may be used, will be identified considering the solutions of NBS catalogue and guidelines for their application developed in Action C3.

In order to better clarify this complex plan process, both from a regulatory standpoint and from an objectives standpoint, a specific tool was developed to communicate the content. <http://www.lifemetroadapt.eu/c2-ptm/> (see C2\_D01 Communicative tools for awareness raising about adaptation strategies)

*Guidelines and training activities explaining how to access existing funding opportunities at regional, national and EU levels.*

As reported in the Deliverable C2\_D03, policies and measures need financial support in order to be implemented, moreover at a local level: big municipalities can usually afford technical and financial support, while smaller local authorities need support from both, technical and financial points of view. The Metro Adapt project supplied technical capacity building for technicians and policy/decision makers, however economic opportunities are not always easy to be exploited by smaller authorities.

A first step for recognizing opportunities is then to be aware about their different typologies and main features. A legal framework is defined by the PTM, a technical support was assured by the partnership of Metro Adapt partnership: financial support will be pursued with the support of the entire partnership and, mainly, with the support of CMM as a coordinator for the metropolitan area.

The financial guidelines supplies up to date information about the main funding programs at European level, national level (considering the main policies activated by the new Ministry), Regional and local level. Moreover, some private funding about adaptation and sustainability were considered.

Beside funding opportunities, the description of related policy guidelines were discussed, and a collection of projects and practice were listed and described as useful examples.

*A fund for municipalities implementing adaptation measures coherent with the PTM.*

The PTM promotes coordination actions, in accordance with LR 12/2005, also through a system of territorial equalization in view of the pursuit of the objectives of metropolitan scale.

To promote the spread of territorial equalization, regional legislation (art. 11, paragraph 2-ter, of the LR 12/2005) provided for the possibility of setting up one or more funds for the development of projects and interventions of supra-municipal importance. The unitary management of the funds is entrusted to the Metropolitan City.

Among the instruments proposed by the PTM for the implementation of the measures introduced in the plan for environmental emergencies and climate change, was introduced the innovative forecast of one or more funds within which will converge a share of the resources generated by contributions payable for urban development operations which generate additional resources. The allocation of funds may also be implemented with real estate assets, contributions from other public entities, private partnerships.

The funds will make a decisive contribution to the implementation of infrastructure, environmental protection and territorial and social cohesion in the metropolitan area.

*A special regulation, developed within each STTM, will lay down the rules for organization, operation and management of the fund or funds and define the rules for the implementation of the fund with municipal resources and the procedures for the decision of operations financed from resources managed by each fund, in accordance with a principle that intervention must be consistent with the source of resources. (see C2\_M04 Evaluation of the setting up of a specific fund dedicated to finance municipalities for implementing adaptation measures)*

*Legal standards and rules enhancing resilience measures*

On the sustainability and adaptation to climate change, the PTM approved introduced an innovative tool called “*Thematic-Territorial Metropolitan Strategies*” (STTM) that defines objectives, proposals, initiatives and specific and localized land management lines on several and specific issues to be transposed into the municipal urban planning tools. (PTM act – article 11)

The STTM prefigure policies and action programs with regard to the themes of metropolitan relevance such as territorial and social cohesion, environmental and landscape protection, efficiency of the settlement system, adaptation of the infrastructure network and development of sustainable mobility. The STTM are open and incremental tools and they are regularly monitored to verify their results. The municipalities, the other administrations involved and the territorial and socio-economic actors directly concerned in STTM actively participate in the process of defining the content and the drafting of each STTM.

The STTM will allow the necessary flexibility of rules that will not derive only from the PTM but can derive from territorial agreements to aspire to the greater effectiveness that connotes the shared choices.

In the *Thematic-Territorial Metropolitan Strategies for sustainability, environmental emergencies and urban & territorial regeneration*, to be activated in a short time from the publication of the PTM on BURL, will find deepening the key issues of sustainable development, the promotion of a circular economy (relaunched by the Next Generation EU) and climate change adaptation measures.

The contents and the indications that emerged in the meetings and activities carried out in Life METRO ADAPT will also be programmatically taken on board in the *STTM for sustainability*.

### **Action C3 - Overcoming uncertainty and barriers to adoption of Nature-based solutions (NBS) in urban context**

Foreseen start date: April 2019

Actual start date: January 2019

Foreseen end date: April 2021

Actual end date: September 2021

#### C3.1 Nature Based Solutions platform

##### *Practical Guidelines regarding the application of NBS in urban context*

AMBIT did a review of existing planning tools, rules and guidelines regarding the application of NBS in the urban context, sharing the experience done by CMM in the H2020 project Nature4Cities. A particular focus, with the support of CAP, was dedicated to the Sustainable Urban Drainage Systems (“Linee guida sull’adozione di tecniche di drenaggio urbano sostenibile per una città più resiliente ai cambiamenti climatici” and “Manuale sulle buone pratiche di utilizzo dei sistemi di drenaggio sostenibile”).

The guidelines have been structured as a guided review of tools which are available mainly at the municipal level and which are able to support the development of different kind of NBS, highlighting the most interesting case studies selected both at local and national level.

This guideline is intended to serve as an easy-to-use tool for making the right choice about site-specific and benefit-specific solutions and is mainly addressed to municipal technicians and policy/decision makers. However, it can be useful for professionals supporting public administrations and private clients, complying adaptation rules listed in the PTM and in local masterplans.

The Guideline was distributed through the communication tools of the project, mainly using the website for promoting their download.

They will also be included in a “ready-to-use” kit to be sent to the CMM municipalities as an action for the “After LIFE” activities.





### *Metro Adapt Platform*

CMM developed a platform [www.cittametropolitana.mi.it/Life\\_Metro\\_adapt/index.html](http://www.cittametropolitana.mi.it/Life_Metro_adapt/index.html), integrated in the institutional site and directly linked with PTM website, in order to make it available to all municipalities that usually visit the site.

This platform allows everyone, free of charge and without the need of installing any further software, to navigate through the product analysis and create real packages of information related to climate change, integrating existing data available in the DeCiMetro territorial database with new data and information coming from the vulnerability analysis (action C1.1) and the tools supporting the NBS development (action C3.1, C3.2).

In particular:

- Urban heat islands
- Flood prone areas
- Soil sealing
- Soil coverage
- Naturalness Index
- Morphological indicators (e.g. distance between buildings, volume inhomogeneity, settlement density, etc.)
- Socio-economic indicators (e.g. different types of housing density, employment, presence of companies ...)
- NBS enhancing the technical green on built environment
- NBS enhancing urban greening
- NBS improving rainwater management
- Planning tools, rules, and other opportunities to develop NBS at the municipality level.

CMM developed this system on its own resources, using DeCiMetro, an internally developed tool that has been implemented through a PON Governance project involving other Italian provinces and metropolitan cities. As reported in Action C1.1, when the proposal was drafted the DeCiMetro platform was not fully developed, but during 2019 CMM, allocating dedicated own budget, improved DeCiMetro platform with new functions, making it able to host and directly manage the Metro Adapt outputs described, in particular vulnerability maps and related GIS database. This delayed the delivery of the platform but, at the same time, allowed some savings and the possibility of a full internal management of the platform for the future updates. Also considering the substantial shift of the PTM timing (see dedicated part in 6.2 Main deviation – Action C2).

The platform is available online since March 2020, hosted by the CMM website [https://www.cittametropolitana.mi.it/Life\\_Metro\\_Adapt/](https://www.cittametropolitana.mi.it/Life_Metro_Adapt/) and it is also accessible from the Metro Adapt website <http://www.lifemetroadapt.eu/it/piattaforma-metro-adapt/>. CMM is taking care of keeping the online platform up-to-date and managing all the previously uploaded content.



### *NBS Catalogue*

AMBIT did a review of existing NBS catalogues developed by EU funded projects (BlueAp, Nature 4 Cities, Naturvation, Klimatek, UNaLab, Green Surge) with the support Politecnico of Milan, as a member of the Knowledge network expert group.

Then, a selection of a set of NBS which are more feasible and which respond to site-specific criteria in the metropolitan area of Milan has been done, together with the definition of the framework of the catalogue and first draft of NBS schemes (synthetic profiles of 4-5 pages). The final draft contains 20 NBS schemes, clustered in three categories: technical green on built environment, urban greening measures, natural water management measures.

Each scheme reports a brief description of the NBS, technical information on planning and design, pros and cons, management and maintenance aspects and 2-3 selected best practices.

To improve the understandability of the information collected, it has been decided to include the best practices in each related NBS description and not to report them in a separate document (as it was foreseen in the proposal).

The Catalogue was completed before Midterm Report and published in the Metro Adapt Platform, and it has been used by ERSAP in its call for proposal for resealing and adaptation projects as a guideline for the applicants.

Its use was then promoted through the workshops for technicians that have been held in February and March 2021 (in action C3.3).

### C3.2 Feasibility studies for the development of Nature Based Solutions

Two feasibility studies have been developed by AMBIT, with the external assistance of IRIDRA concerning adaptation measures to be implemented in the Municipalities of Parabiago and Buccinasco. The most suitable areas and NBS typologies have been defined by AMBIT in co-operation with CAP, for the development of the 2 feasibility studies.

Both the studies have followed the same methodology: the development of different possible alternatives to solve a problem of water management linked to climate change and the evaluation of the different alternatives assessing their costs and benefits in term of ecosystem services through Multi Criteria Analysis. For the estimation of the ecosystem services the software BEST (Benefits Estimation Tool – valuing the benefits of blue-green infrastructure, [www.susdrain.org/resources/best.html](http://www.susdrain.org/resources/best.html)), developed by UK CIRIA, has been used.

#### *Parabiago Feasibility study*

The study made in Parabiago(annex C3\_D03) concerns a service road in an industrial area that need to go through maintenance and restoration. The whole area is presently asphalt paved and includes 7,300 m<sup>2</sup> of road surface, 2,700 m<sup>2</sup> of parking areas on both sides of the road, 3,400 m<sup>2</sup> of sidewalks and a few hundred m<sup>2</sup> of green spaces. The study is aimed at comparing different technical solutions to improve the stormwater management of the site, in the key of climate change adaptation in two scenarios: one that just reduces the stormwater runoff and another one that completely avoids runoff by storing stormwater in underground tanks.

For each alternative, an estimation of the construction and management costs and of the main benefits (in term of ecosystem services) provided has been done.

The alternatives that do not include stormwater storage tanks show realisation costs ranging between 395,000 € (Alt.0.1) and 500,000 € (Alt. 1.1), while the one that envisages stormwater tanks ranges between 900,000 € (Alt.2.2) and 1,370,000 (Alt.1.2).

The results of the evaluation showed that in both scenarios (the one that reduce runoff and the second that completely avoid any runoff) the best performing alternative is the alternative 3 (Equipping the whole area with bioretention areas) that offers several other benefits in front of a negligible cost increase.

#### *Buccinasco Feasibility Study*

The feasibility study made in Buccinasco(annex C3\_D04) concerns the possible solution of an existing problem of water pollution, due to the wastewater discharged by a Combined Sewer Overflow in a nearby water course. As for the Parabiago case, several possible alternatives have been developed and analysed through MCA approach, considering the possible Ecosystem Services and using the BEST software for the prediction of effects. In this case the alternatives developed were 3 grey infrastructures (Alt1.1, 1.2, 1.3) and 3 green infrastructures (Alt. 2.1, 2.2, 2.3).

Evaluation criteria chosen are slightly different by the ones chosen for the Parabiago study, as well as the weights of the different criteria.

Construction costs in the Buccinasco study range roughly between 300,000 € (Alt.1.1) and 1,200,000 € (Alt.2.3); however, considering all the evaluation criteria, Alt.2.3 was largely the most performing one: on the normalized scale 0 to 1, Alt.2.3 (Two stages - reed bed + free water wetland - natural treatment and discharge to the stream as part of a new urban park) scores 0.64, while the “grey infrastructure” alternatives ranges between 0.35 and 0.40.

### C3.3 Development of technical standards and training of Nature Based Solutions

#### *Technical Workshops*

Technical workshops are described in Deliverable C3\_D05. The action started, as foreseen by the revised schedule, in September 2020, and the first workshop, organized the 16<sup>th</sup> of December 2020, has been specifically targeted to water management utilities and focused on Sustainable Urban Drainage Systems and promoted by AMBIT and CAP, also through the Water Alliance network. The workshop was attended by 33 participants.

The other two workshops were more targeted to decision makers and technicians working in the 133 administrations of CMM and were organized on the 23<sup>rd</sup> of February and on 1<sup>st</sup> March 2020.

The February workshop was more generally addressed to a wider public of technicians coming from Public Administration, but also to engineers, architects and urban planners working at Regional level, and was attended by 57 participants. The workshop presented strategies and tools that CMM made available with the PTM and with Metro Adapt findings: risk and vulnerability maps, NBS catalogue, NBS guidelines and standards. In order to be more concrete, the workshop presented case studies coming from the Metro Adapt realisation.

The March workshop started from the February one's results and was attended by 28 participants, mostly from local municipalities' technical offices and targeted on the more interested participants to the February's meeting. Participants were invited to actively bring examples of adaptation case studies to be addressed with NBS and SuDS solutions, creating a dialogue with the Metro Adapt experts and pointing out criticalities about technical feasibility, local needs, economic feasibility and administrative matters.

### *Technical Standards*

Technical standards are reported in Deliverable C3\_D06. This document contains the main features of each NBS that was selected by the project to be proposed in the Catalogue in order to highlight the multi-benefits addressed by the solutions and the specific targets of each solution. This is intended to be a ready-to-use manual for NBS selection, supporting policy-makers and technicians decision processes and enhancing the dissemination of NBS practice as adaptation tools and in their integration in planning tools and processes.

During the previous described workshops, Metro Adapt experts discussed the technical standards approach and collected information about the needs for Nature Based Solutions to be included in local Plan and/or local Building Regulation. This information was integrated by AMBIT to better define the existing technical standards published in the CMM Territorial Plan (PTM) and to address the Technical Standards produced by the project in the C3\_D06.

Technical standards were then published and distributed through the project website and will be included in a ready-to-use kit to be distributed to the CMM municipalities within the After LIFE actions.

### *Field visits*

Field visits reports are reported in Deliverable C3\_D07. Four site visits were foreseen to the demonstrative sites in Masate and Solaro demonstration sites. Due to the COVID-19 crisis, only two took place with didactic propose: on the 8<sup>th</sup> June 2021 in Solaro (with 45 participants), and on the 10<sup>th</sup> September 2021 in Masate (with 30 participants), supported by a workshop each. A third visit to the Solaro site was organised on the 21<sup>st</sup> September 2021 within the pre-COP26 events organised by the Ministry of the Ecologic Transition (15 participants).

In order to overcome the limitations created by the COVID-19 pandemic to live visits, two videos were created in order to engage a higher interested public and create a widespread knowledge and awareness on NBS and SuDS as solutions to Climate Change impacts at local level.

The C3 Actions actively interacted and was coordinated with Activities C4 and E1.

## Action C4 - Enhancing bottom-up initiatives and developing demonstrative measures

Foreseen start date: April 2019

Actual start date: December 2018

Foreseen end date: June 2021

Actual end date: September 2021

### C4.1 Raising awareness and engaging citizens

In relation to the **theatrical performances**, LAL identified some potential theatre troupes at the beginning of the project. After an identification and a price quotation (best value for money), the assignment went to “ArditoDesio” company with the performance “Pale Blue Dot”. The location for the seven performances has followed these criteria: one for each homogenous area, a theatre and, where it is possible, a Legambiente local group. The presence of a Legambiente local group is an added value as there are several local relationships and a help for local bureaucratic issues and for the involvement of the municipalities. The selected towns were: Cormano, Parabiago, CesanoBoscone, Gorgonzola, Rho, Paullo, Abbiategrosso.

All the performances realised were promoted by offline and online communication tools, such as project website, partners’ websites, at local communities level, social media and so on.

As foreseen in the activities of action C4, 6 theatrical performances were carried out in presence (+ participation to an additional event in Milan, organized by the PACTA Festival in collaboration with Legambiente and the LIFE Metro Adapt project. A part in the morning with 150 high school pupils and a part in the evening with the citizens), while from March 2020, given the COVID-19 situation, another 2 were showed, but in streaming mode, and the last event in attendance at the Piccolo Teatro Grassi in Milan, an historical location for Milan’s theatre culture, pointing out how this language can be critical in bringing the Climate Change message. Every event included an introductory part explaining the Metro Adapt project, and a closing part including public debate on the issues raised by the show.

Due to COVID-19 emergency 7 performances were realized in presence and 2 online. A total amount of 1154 participants attended the play, on and offline.

In particular, the performance “Glialberiballano” was dedicated to children, involving the primary schools from all over the region, and was chosen as an opportunity to “talk” to the youngsters in an easier way than “Pale Blue Dot”, that has a “15 yrs old” target.

The calendar of the live performances is reported hereafter:

25<sup>th</sup> September 2019 - Cormano

10<sup>th</sup> October 2019 - Parabiago

14<sup>th</sup> November 14, 2019 - Paullo

29<sup>th</sup> November 2019 – CesanoBoscone

6<sup>th</sup>/7<sup>th</sup> February 2020 – Milano 1

8<sup>th</sup> February 2020 – Gorgonzola

25<sup>th</sup> February 2021 – The Nature of Cities festival – Performance Trailer and debate with authors

22<sup>th</sup> April 2021 – ONLINE in English

24<sup>th</sup> September 2021 – Milan “Piccolo Teatro” theatre

3<sup>rd</sup> June 2021 – ONLINE Performance “Gli alberi ballano”

The performances realised were very successful, dealing with climate change issues with very high scientific approach and, at the same time, with an emotional one, typical of the theatre. This was also discussed during a TNOC event where the English Trailer of the play was presented and the use of theatre language for communicating Climate Change issues was debated.

In relation to the 7 **thematic seminars**, the method followed for the identification of the locations was the same used for the performances: one per each of the homogeneous areas of metropolitan area, with the presence of Legambiente local groups and proper public places.

The first two seminars were realised, involving about 50 people:

9<sup>th</sup> March 2019 Thematic seminar “Al tempo dei cambiamenti climatici: strategie di adattamento e mitigazione in atto” – Fa’ la Cosa Giusta Fair – Milano (22 participants)

7<sup>th</sup> February 2020 Thematic seminar “Le città si adattano al clima che cambia: fra strategie tecniche e stili di vita” with catering – Pacta theatre Milano (<http://www.lifemetroadapt.eu/it/2020/05/19/le-citta-si-adattano-al-clima-che-cambia-fra-strategie-tecniche-e-stili-di-vita/>). The seminar (23 participants) was organized the same evening of the theatrical performance Pale Blue Dot, inside the PACTA Scientific Theatre Festival. As a parallel event of the seminar and the PACTA Festival, during the day LAL participated and shared Metro Adapt project contents in high schools, involving about 150 students.

The realised thematic seminars were reported in short overviews, together with the list of participants.

On 15<sup>th</sup> July 2020 the 3<sup>rd</sup> seminar entitled "Nature-Based Solutions as an opportunity for urban sustainability" was realised in online mode. (16 participants) - <http://www.lifemetroadapt.eu/it/2020/07/24/nature-based-solutions-come-opportunita-per-la-sostenibilita-urbana/>

On 17<sup>th</sup> November 2020, the 4<sup>th</sup> seminar was organised with the communication expert Luca Lombroso and dedicated to explaining the updated data on the climate emergency (online mode: 31 participants on Zoom + 25 on Facebook) - <http://www.lifemetroadapt.eu/it/2020/12/09/clima-e-resilienza-i-webinar-di-metro-adapt/>

On 26<sup>th</sup> November 2020, the 5<sup>th</sup> seminar was organised again with the involvement of the expert Luca Lombroso, but dedicated to focus the changes in the communication of the climate emergency. The event was insert in the “Fa la Cosa Giusta” national fair program (online mode, with 121 participants) - <http://www.lifemetroadapt.eu/it/2020/12/09/clima-e-resilienza-i-webinar-di-metro-adapt/>

In 2021 the last 2 seminars were organized in occasion of the field visits to Solaro and Masate demonstrative realisations (see also C3.3).

The first one was organized on the 8<sup>th</sup> June 2021 in Solaro. After a technical tour with a presentation by CAP on the realized intervention, the event went on with an informative talk on NBS with local authorities, local groups and CMM (45 participants). - <http://www.lifemetroadapt.eu/it/2021/06/11/soluzioni-verdi-per-lingegneria-civile-per-contrastare-i-cambiamenti-climatici/>

The second one was organized on the 10<sup>th</sup> September 2021 in Masate. At the beginning a seminar on NBSs and the opportunity of their implementation in other territories and contests was realized and later a technical visit was organized with the explanation of the interventions by CAP (30 participants). - <http://www.lifemetroadapt.eu/it/2021/09/15/mitigazione-del-rischio-idraulico-in-area-urbana/>

The seminars allowed to reach in total an estimation of 313 participants. We must say this is a low estimation, since in some case we could not clearly count the participants thorough web tools and only have visibility of the connection of a single account.

The **photo contest** was delayed due to the COVID-19 emergency. It was launched in Spring 2021 and the ceremony award was organized on the 28<sup>th</sup> September 2021. The participants were 14 with 25 photos and the winners received materials and tools for photographing, such as a drone, an action camera, a carbon tripod, camera backpack and a mini-table tripod. A jury composed by a representative of each partner's and a professional photographer selected the first 4 winners and the last one was voted by citizens using the dedicated Instagram project's profile: [https://www.instagram.com/life\\_metroadapt/](https://www.instagram.com/life_metroadapt/)

This is also composing a photo album that can be useful for communicating climate change issues through the visual language in a very original way.

The **Contest of ideas** was not carried out, due to the COVID-19 emergency. However, different tools were realized in order to maintain the aim of the action to engage citizens in climate change mitigation and adaptation actions, even if the COVID-19 emergency heavily limited the foreseen activities.

An animation video was elaborated and distributed to all the 106 secondary schools of Metropolitan area of Milan together with an "education kit". The video was effective, easy and clear, with an interactive part at the end stimulating the dialogue among teachers and pupils and creating the environment for questions and debate.

Italian: <https://www.youtube.com/watch?v=ciThhm7yHws>

English: <https://www.youtube.com/watch?v=wqfMThiCvrY>

#### C4.2 The demonstrative adaptation facilities

The activity has been focused on the development of the two demonstrative realisations featuring the introduction of Sustainable Drainage Systems (SuDS). The two locations identified in the project proposal, the municipalities of Solaro and Masate, located respectively in the North-West and North-East part of the

Metropolitan City of Milan, have been confirmed and the technical discussion with the local authorities was engaged from the beginning of the Action.

#### Solaro demonstration facility:

The civil works pertaining to Solaro demo facility started in mid-March 2020, and they have been finalized in late summer. In early December 2020 the garden areas have been designed in collaboration with AMBIT and the realization has been completed during spring 2021. The testing of the facility has been finalized on 28<sup>th</sup> July 2021.

The Solaro experience was uptaken by CAP in order to design and realise a new site in Varedo, a municipality in the Metropolitan Area.

#### Masate demonstration facility:

The works of the NBS project for Masate demonstration site have started in May 2020 and have been finalized in late autumn, despite several interruptions due to the COVID19 pandemic. The testing of the facility has been finalized on 27<sup>th</sup> July 2021.

The Masate experience was uptake by CAP in order to design and realise a new site in Paullo, a municipality in the Metropolitan Area.

In order to explain to the citizens all the work done Legambiente and CAP realized 2 notice boards (located closed to the interventions in Masate e Solaro and 2 videos (<http://www.lifemetroadapt.eu/it/galleria/>) dealing with the presentation of the activities from the beginning to the end.

### Action C5 - Replicability and transferability at national level

Foreseen start date: April 2020

Actual start date: April 2019

Foreseen end date: September 2021

Actual end date: September 2021

This action is one of the most subject to change because of the effects of the COVID pandemic and therefore we had to rethink new ways of working to implement tools for transferability and replicability that had never been used.

As will be seen in more detail in the next chapter, we are reviewing all these activities in an attempt to maintain the spirit of transferability and replicability, but changing the modalities and perhaps also the targets.

We therefore developed tools that could be used during the pandemic period, but also that would remain available at all times for the replicability and transferability of the project.

Regarding the **replicability** of the project we have developed an interactive tool in Italian and English to guide an interested party in the process of creating their own adaptation strategy. <http://www.lifemetroadapt.eu/c5-replicability/> (see C5\_OD03).





For the **transferability** of information and methods to the municipalities of the metropolitan city, an enormous amount of work has been done to prepare the information, to rework it in graphic and graphical form, and to design a new interactive tool. 132 micro-sites have been created in an easy-to-use platform, one for each Municipality of the Metropolitan City of Milan, which photograph in a precise but simple way the climate situation and the criticalities that can be identified in the municipal territory, and then provide possible adaptation measures that exploit the Nature Based Solution and, in parallel, indicate the priorities for design indicated in the MNC and the relevant legislation. <http://95.110.222.198/life/> (see C5\_OD02).

#### C5.1 Replicability and transferability at National level

The work carried out so far in action C1, C2 and C3 has revealed a difficulty in translating the scientific analyses carried out into disseminable and easily replicable information. Therefore, it was decided, also thanks to the strengthening of the CMM Additional staff Communication Expert in this action, to focus on the creation of technical infographics that simplify, without trivializing, the scientific concepts underlying the studies.

In summer 2020, the Exploitation plan of the technological project results was developed by CMM in graphical form. due to the second COVID-19 wave in September 2020, all modalities of replicability and transferability had to be questioned. In reference to action F1, steering committees have been held for this reason and a “Metro Adapt COVID Resilience Plan” was drafted and put in place in order to map and set other opportunities for replicability and transferability, as well as for rethinking activities in a resilient way.

#### *Legambiente groups*

The workshops with Legambiente Toscana and Emilia foreseen in Autumn- Winter 2020-2021, have been shifted and realized online on 9<sup>th</sup> March 2021 due to COVID-19 emergency. On October 26<sup>th</sup>, 2020, a thematic seminar on climate change was held within the Annual National Assembly of Legambiente local groups, carried out online, also integrating issues about climate change and climate change adaptation. It was an opportunity to present the LIFE Metro Adapt project in the presence of over 200 people from all over Italy.

Other 2 workshops were dedicated to the local groups of Legambiente, directly following the 9<sup>th</sup> March themes:

*“Come cambiare la comunicazione sul climache cambia nelle aree metropolitane”* (How to adapt communication about a changing climate in Metropolitan Areas, with a total of 26 on-line participants) participants;

*“Città metropolitane alla prova dell'emergenza climatica. Le soluzioni verdi che cambiano il paesaggio urbano”* (Metropolitan Areas in climate emergency. Green solutions changing urban landscape, with 25 on-line participants)

both tackling the climate change communication issue and the adaptation solutions for Italian cities.

### *River Contracts*

On 3<sup>rd</sup> April 2019 a first introductory meeting was organized with the River Contracts managing Authority for the Regione Lombardia, that was then informed on the projects' results and tools during a second meeting, with the facilitation of Legambiente, on 9<sup>th</sup> June 2021. In this occasion, all the LIFE Metro Adapt documents that can be useful for the signatories of the River Contracts were described and displayed, a formal request was made by the Region in order to have the guidelines and the standards produced by Metro Adapt included in the River Basins strategic plans. After this meeting, the strategic guideline produced by Metro Adapt were integrated in the Olona Basin Strategic Plan and will be integrated in other River Contracts' Strategic Plans in future.

Moreover, the Regional body managing the River Contracts process, ERSAF, decided to include the NBS technical guidelines and catalogue produced by the project in the desealing call for proposal that was promoted during summer 2021 and closed on 16<sup>th</sup> October 2021. This means that the Project's products were distributed to the whole Region's Municipalities and that NBS selected by Metro Adapt catalogue were adopted by the first 8 municipalities participating to the call for proposal that obtained the grant.

### *Other metropolitan areas*

Initially, CMM and Egeos have been contacted by the Metropolitan City of Rome Capital, with whom we have shared some problems of this area in order to transfer the possible results. In addition, the June 2020 webinars on maps and data were very important because they put us in contact with other public administrations to replicate and transfer the results of action C1.

On December 10<sup>th</sup>, 2020 CMM and Egeos participated in the National Conference of the Ministry of Environment "Methodologies for climate change adaptation: adaptation planning at local scale". On this occasion it was possible to contribute, with the experience of the Life Metro Adapt project, to the replicability of the method of analysis and adaptation to Climate Change at national level.

Representatives of all regions, metropolitan cities and central PA, as well as the most significant municipalities attended the meeting (including Genova, Bologna, Torino, Cagliari, Roma).

Metropolitan City of Milan on 4<sup>th</sup> December 2019 signed a collaboration agreement with the Ministry of the Environment and Protection of Land and Sea (MATTEM), now the Ministry of Ecological Transition, aimed at defining the Urban Metropolitan Agenda for Sustainable Development that will indicate the specific actions to achieve together with the other Italian Metropolitan Cities the objectives set out in the National Strategy for Sustainable Development pursuant to Article 34 of Legislative Decree No. 152 of 3<sup>rd</sup> April 2006, as amended. The control room is Benessere Italia, the technical-scientific support body to the Prime Minister. A strategic role is also played by the CREIAMO PA Project - Implementation and monitoring of the 2030 Agenda L2-WP1 - which accompanies the Italian Metropolitan Cities through coordination meetings and training seminars in sharing a common work, creating synergies and supporting the exchange of experiences. for more details on the involvement of Italian metropolitan cities see C5\_D04 (Report of involvement of others Italian metropolitan cities).

The Agenda 2030 process will end in March 2022. The core issues of the LIFE Metro Adapt project is close to the task of drafting, coordinating and managing the Metropolitan Agenda for Sustainable Development. It has then been very easy to maintain a continuous contamination between the outcomes of the LIFE Metro Adapt project and the 2030 Agenda pathway.

Concretely, the Adapt LIFE Metro Project has brought these important contributions to the 2030 Agenda:

- Definition of Goal 13 for the metropolitan territory, identifying at the different scales of interest types of actions and interventions in terms of adaptation and mitigation;
- Creation of a set of specific indicators on Goal 13 at the local and metropolitan scale that can be added to the more generic indicators present in the 2030 Agenda Data Lab;
- Integration of the Climate Knowledge Network of the Life Metro Adapt Project within the wider NetLab of the Agenda, which will serve as a territorial reference for the knowledge and definition of coordinated and shared strategies with the territory;
- Following the identification of NBS adaptation measures in the Life metro Adapt project, a Special Project Urban Regeneration through Nature-based Solutions was formally carried out in the Agenda.
- This Project, carried out in collaboration with the Urban Studies Department of the Politecnico, has the concrete objective of bringing the NBSs selected by the Life Metro Adapt Project into the Metropolitan Building Regulations, through the identification of ready-to-use technical specifications for municipalities and territories.

#### *Agreement with ANCI and the Metropolitan Cities*

ANCI is the National Association representing Local Administrations. Throughout 2020, ANCI's coordination focused on coordinating the activities of Mayors with respect to the actions to be undertaken to counter the pandemic crisis.

In the meantime, following the Bologna Charter, the metropolitan cities have all started to draw up their own Sustainable Development Agendas, in coordination with each other and with the Ministry of Ecological Transition.

In essence, the metropolitan cities, with Milan in the forefront, have decided to implement the commitments of the Bologna Charter in the Agenda (our two Agenda pilot projects are the first two points of the Bologna Charter, for example).

The dialogue with ANCI therefore continued in a very significant way by bringing a senior delegate from the ANCI Lombardy structure to the final event of the LIFE Metro Adapt project, and by ensuring that the LIFE Metro Adapt project was integrated (3 training sessions) into the Sustainability Workshop that ANCI Lombardy organized from October to November 2021 for the administrators and technicians of the Lombardy municipalities.

For more details see C2\_D04 (Report on the assessment and enhancement of mainstreaming adaptation in the PTM and the municipal planning tools).

#### *NBS measures replicated by CAP*

As already described in C4.2, thanks to the experiences gained during the Life Metro Adapt, CAP projects have already been replicated by designing and implementing NBS in a car park in Paullo (uptaking the experience of Masate site) and in Varedo (uptaking the experience of Solaro site) with a total extension of more than 1 hectare.

## C5.2 Replicability and transferability at European level

### *Organization of two mutual learning workshops and networking with key stakeholders*

On October 22<sup>nd</sup> 2020, within the occasion of the workshop "Adapting European Metropolitan Areas to Climate Change" that the Project organized within the 18<sup>th</sup> European Week of Regions and Cities, a stakeholders' mapping has been realized, identifying more than 90 cities, metropolitan cities and public entities potentially interested in the project activities and results. Within the workshop, a mutual learning session has been organized involving the Metropolitan Area of Barcelona and it has involved more than 50 stakeholders representing cities, metropolitan areas and civil society organizations.

On 4<sup>th</sup> November 2020, Metro Adapt presented its tools to a Training Program webinar, organised by a Mexican City Network for the promotion of NBS, with 130 participants.

On 21<sup>st</sup> September 2021, a third mutual learning session was organized by Metro Adapt: "Climate Change Adaptation Strategies in European Metropolitan Areas". This workshop has been held within the preCOP26 program produced by Metro Adapt and promoted by the Italian Ecology Transition Ministry.

### *Realization and dissemination Europe-wide of a practical handbook*

As declared in the project mid-term report and as discussed during the Monitoring Visit held on the 24<sup>th</sup> of June 2020, considering the objective of the handbook, consisting in gathering and disseminating the results and expertise of the project and due to the possible delays related to the COVID-19 emergency, the partners have decided to postpone the elaboration of this product (originally foreseen for June 2020) in order to be able to present the produced outputs, the lessons learned and the achievements in a more complete way. The final version of the handbook has been uploaded on the project web platform and made available to the public.

### *Realization of three webinars*

Metro Adapt has developed three webinars with the aim of transferring the project results at EU level. The three online conferences have been held as follows:

- First Webinar: held on 22<sup>nd</sup> October 2020 and focused on climate change adaptation strategies in metropolitan areas and cities, "Adapting European Metropolitan Areas to Climate Change" was attended by 144 participants. The webinar was organized in the framework of the 18<sup>th</sup> European Week of Regions and Cities and analysed the key role of European metropolitan cities in defining a climate change adaptation strategy at the local level, based on good practices developed by CMM and the Barcelona Metropolitan Area.
- Second Webinar: held on 23<sup>rd</sup> February 2021 and focused on the replicability of the project activities, "Nature Based Solutions as a means to boost urban climate change adaptation" was attended by 72 participants and integrated in The Nature Of Cities Festival 2021 online edition

· Third Webinar: was held on 4th June 2021, focused on Climate change adaptation strategies in public policies. “Zero pollution challenge and Nature-Based Solutions: The leading role of metropolitan areas and EU financial instruments” was attended by 26 participants.

The webinars involved both representatives of the project partners and representatives of international organizations, local governments, other LIFE projects and academics with whom the project has always constantly created synergies.

Due to the Covid situation Egeos could not meet and share the projects technological results, and instead of **the exploiting of the technological results for business opportunities**, the partnership decided to create a video on the use of spatial data processing for climate analysis (E1\_D08).

With the aim of maximizing the impact of the project dissemination activities, transferring the project generated knowledge and achieved results, ALDA involved in its networking activities its members (especially local and metropolitan authorities), its partners involved in other EU funded projects (such as MEANING, LADDER and BEWARE) and the LIFE projects whose thematic focus is related to Metro Adapt. The dissemination activities were carried out through the project communication channels (website, newsletter, Facebook page and Twitter page) and alongside the organization of webinars and mutual learning events (for more details see the chapter E1).

## Action D1 - Monitoring of the impact of the project actions

Foreseen start date: July 2019

Actual start date: July 2019

Foreseen end date: September 2021

Actual end date: September 2021

### D1.1 Monitoring the environmental, social and economic impacts

#### *Data collection procedures*

Monitoring activities were mainly based on environmental and socio-economic data collected through the CMM territorial database DBT, statistical indicators, information from satellite-derived remotely sensed data. At this section, monitoring is intended as long-term action for assessing the impact of the project on the mentioned data, indicators, and maps in the future 5-10 years.

Both raw and processed data have been collected and produced through the development of different project actions. Most of the information, including environmental and socio-economic data, has been spatialized thus creating maps both at the territorial and municipal level.

Environmental and socio-economic data, indicators and derived maps are available through a dedicate section within the METRO ADAPT webpage and Platform (see C3.1). The latter is an open access tool for citizens, public administrations, and specialists. The platform is the main instrument for supporting climate change mainstreaming and capacity building.

The final version of the deliverable D1\_D01 “Procedure per la raccolta dati e la compilazione degli indicatori” including procedures for data collection and indicators compilation related to the NBS development, have been finalized by AMBIT in November 2019 (supported by CAP and CMM), once the first drafts of the two demonstrative measures designs of Solaro and Masate – and the related technical information - were ready. The documents clearly identify which is the information needed to be collected and who is the partner responsible for it.

In order to facilitate data collection, AMBIT elaborated an excel file attachment containing 3 sheets related to the different issues monitored which has been uploaded on the shared FTP and that had to be filled in by each responsible for data collection every 3 months (D1\_D04).

In addition, CMM has developed a specific online Webgis tool to collect the technical information and specifically on Nature-based solutions implemented in the Milan metropolitan area. As described in the AfterLife Plan, CMM and all partners are committed to develop and implement. (D1\_OD04 Monitoring of the technical actions of the project and Webgis tool)

#### *Indicators monitoring different kind of impacts:*

- **Increase of Nature Based Solution in order to reduce peak flows:** According to available data, around 185 km<sup>2</sup> and 390,000 people are interested by flood risk. A small but significant effect could be expected if at least 2 km<sup>2</sup> are equipped with NBS able to decrease by 30% the peak flow discharge. Considering that NBS allows to cut peak flow by 140 L/sec, its application to an area of 2 km<sup>2</sup> can generate a reduction of around 28,000 L/sec, reducing flood risk. A total of 9000 m<sup>2</sup> of paved area were be disconnected.
- In Solaro and Masate demonstrative sites reached a total of 0.9 hectares interested by NBS realization, reducing in both cases peak flows between 73 and 77 L/sec and draining precipitation waters. Extending this effect to the already realized sites in Varedo and Paullo (not foreseen in the proposal), we reach almost 2 hectares by the end of the project.
- Introducing NBS approach to SuDS will not have immediate impacts on a wide scale, however, now that PTM is approved it will boost the NBS application to the Municipal Management Plans and, considering an horizon of 10 years, we can set a target of at least 1% of public and industrial paved areas to be desealed.
- Areas were directly interested by the creation of adaptation measures promoted by the project in the towns of Solaro and Masate, and as a replication in the towns of Varedo and Paullo.
- Given the adaptation approach that was intook by the technicians working on municipalities' territories, we can expect that each maintenance intervention and many risk prevention measure will apply the project's guidelines for adaptation up to 50 hectares in the entire Metropolitan area. More in general, the adaptation measures included in the CMM territorial plan could influence the planning tools of the 133 CMM municipalities, and so all their territories.
- **Climate change mainstreaming and capacity building:** a total of 1040 single networking participants were involved in mainstreaming and capacity building activities: participants in thematic on-line (242) and live (120) seminars and participants to local groups' seminars (281); participants to events in Milan live (397); participants in conferences and workshops organized at international (more than 1162) and national level (more than 2603) and with the other Italian metropolitan cities (90). Participants to live (460) and on-line (744) theatre performances. Finally, 103 professionals and technicians were involved in technical workshops.



- Questionnaires were distributed to Public Administration officers and Technicians, technical professionals like engineers and urban planners, decision makers. Focused questionnaires were asked as structured interviews to the Climate Knowledge Network key-participants. These questions were aimed to focus the needs and request for knowledge and support about climate change adaptation measures. 79 people answered the questionnaire for the technicians and policy makers, depicting a clear concern for the climate change impacts on urban areas. The majority already knew about the PTM contents about climate change adaptation, anyway many of them were not aware about their organization instruments for planning adaptation measures (D1\_D02 All1). The interviews carried out and reported in C2\_D01 were carried out during September 2021 and showed general awareness about effects of climate change, particularly about floods and droughts (run off management and changes in rain distribution) and heat management, highlighting the impacts on energy production, agriculture and on public health. Awareness about adaptation measures clearly states that NBS are considered the most successful solutions, together with the knowledge increasing and capacity building. Obstacles were identified in the sectorial approach that the Public Administration still holds in dealing with complex problems, but still planning tools can be critical in dealing with climate change effects, and that technical support and training is crucial.
- In fact, 3 Local Authorities took the adaptation guidelines in local planning (Milan, Bareggio, Melzo) and 8 used the guidelines for applying to a Regional financing measure based on the Metro Adapt guidelines.
  - **Communication, dissemination, awareness raising:** The use of the web platform and the downloads from it, show how information and data availability are important for the wide public in order to deal with climate change matters. Awareness raising and communication activities showed how there is a strong request for clear information and for a transparent dialogue between citizens and governments, starting from the local and growing up to the national level. Metro Adapt created a communication set of tools spanning from general targets, up to specialized targets. Each tool involved a different kind of language, showing how it is not possible to have just a way to communicate such a complex theme.
- At the end of the project, a total amount of 121.499 unique visits were totalized for the project's website.
- Overcoming the governance barriers between local governments, regions and national government pointed out how the Metropolitan dimension can be crucial since it relates to a homogeneous territory and, at the same time, can take policies from the national and regional level and translate them to the local and municipal level, supporting the lack of technical competencies and hosting data and information for municipalities who could not afford their collection.
- Languages were recognized as crucial vessels of awareness: emotional use of theatre or pictures supplied a new way for storytelling technical issues like climate crisis. Theatre performances, with a strong scientific base, supplied answers to citizens' questions. But also could use a clear and understandable language for sharing knowledge, and the high numbers of participants showed the interest of people. The few pictures, if compared to the wider participation to the project's activities, taken by participants to the Photo contest showed how it is difficult for citizens to see and explain climate change impacts in their everyday life.
- More in general, the use of videos supported the awareness raising in an understandable and clear way, also proposing a solution to the COVID-19 obstacles in having face to face activities. Videos are long enough for telling a story, but they are not too long to be listened at by children or common people. Videos were also used to create a climate-related Italian taxonomy, useful for dissemination avoiding English words that often can be felt as obstacles in comprehension: animation videos



reached a total of 1076 visualisation by the end of the project, if compared to the more institutional videos plaining describing the project and its results (534 visualisation in total).

- Other tools for communication and dissemination were 14 printed panels (used for many different events or for describing pilot sites in Masate and Solaro), 26 events organised in order to tell a broad or specialised public about the project, 5 videos, 13 articles on printed media.

### *Social and health benefits analysis*

The adoption of the Metropolitan Territorial Plan containing strategic climate change adaptation measures could influence all the municipal planning tools of the linked 133 municipalities and so all their inhabitants (3.254.000 in total). As a more direct beneficiary target, we can count a total of 2188 people: 1318 estimated people attending theatre plays; 406 people attending webinars and workshops addressed to citizens and non-technical concerned citizens; 222 technicians attending conferences and workshops; 242 technicians and policy makers attending technical workshops in Europe and Italy

The main social and cultural benefits were derived from the creation of a cultural and wide approach to climate change adaptation: different languages deployed by the project and demonstrated to be clear and comprehensible to a wide, non-selected, public. Languages like theatre, photography, storytelling, videos contributed to a cultural mainstreaming of the climate issue in the daily life (see Action C5).

The Climate Knowledge Network's main stakeholders were subject to interviews (6 in total) in order to monitor the awareness and needs expression at the end of the project: policy makers and decision makers mainly were considered.

79 questionnaires were carried out and submitted to a wide range of professionals, technicians, policy makers in order to understand the level of concern and awareness before the technical workshops were carried out.

The interviews stated the key-informant and policy maker interest on the problem and the need for an even more wide awareness within all the population groups: policy makers, financial and economy stakeholders, civil society, public administration, technicians, scientific research, citizens. This was also stated in the results of the questionnaire asked to the technician and public administration's actors, supporting the request for correct, clear and transparent communication.

### D1.2 Monitoring and measure the Life project performance indicators

On the base of the data collection and analysis described in D1.1, AMBIT has defined a specific excel sheet reporting an update (whenever possible) of the LIFE project performance indicators (D1\_D02). The monitoring file collecting information about the implementation of works in the two demonstrative sites, all the events organised by the Metro Adapt team and the communication and exploitation activities attended by the project's partners has been regularly uploaded.

Selected KPIs was uploaded on the portal in July 2019 and validated by EASME. In the monitoring excel file KPIs values updated in February 2020 have been reported, together with a synthetic assessment about the

level of implementation and the distance to the target set ("Assessment of the impacts of the project actions").

Social and health benefits analysis mainly focused on the perception about Climate Change Adaptation measures and targeted three different groups: citizens, decision makers and technician/professionals. Informations were collected through questionnaires distributed during the dissemination activities organized with citizens in C4.1 (thematic seminars, photo contest), the meeting of the Climate Knowledge Network involving local decision makers (C2.1) and the training activities involving technician and professionals (C3.3).

Two different questionnaires have been drafted by AMBIT and shared with the other partners, the first one targeted to policy makers and technicians and the other one to key characters from the CKN.

## Action E1 - Communication and dissemination of results

Foreseen start date: September 2018

Actual start date: September 2018

Foreseen end date: September 2021

Actual end date: September 2021

### E1.1 Communication and dissemination tools and materials

#### *Communication materials*

During the first months of the project LAL, after the identification and request for price quotation for graphics experts (the best value for money), started to work on the Metro Adapt **visual identity**. First logo proposals were shared with the project partners, finalizing the definitive logo in January 2019. In the first 6 months of 2019 the visual design identity, templates for presentations and posters, 6 noticeboards/roll-up and communication plan were delivered. 2,300 project **leaflets** were printed in Italian version. In the second part of 2019 the English version of the project leaflet was printed in 1,000 copies. The realization of the **first foreseen video** started with the screenplay writing, was finalized in February 2020, after a long but productive discussion with all the partners. The video was promoted both on the project website, the project social media and through Facebook of LegambienteLombardia (<http://www.lifemetroadapt.eu/it/galleria/>). It was also shown to the public at the second seminar in PACTA Theatre festival, during the final events in September 2021. During all the online initiatives the video link was promoted to the participants in chat. A **final video** was realized in order to present all the project results with interviews to all the project partners. It was shown during the final event on 28<sup>th</sup> September 2021 and during the photo contest award ceremony. The video was promoted both on the project website, the project social media and through Facebook of LegambienteLombardia (<http://www.lifemetroadapt.eu/it/galleria/>). After sharing the first draft with all the partners a **postcard** in three different versions was printed in June 2020 (500 copies). In order to promote the final events in September 2021 a **postcard** with the whole program was realized and printed (500 copies). During the final events project **bags** were distributed to the participants (n. 200) and some materials were realized for the setting up, such as 4 **infographic posters**, **table covers**. The activities related to the final events were

realized in collaboration with ALDA. Due to the COVID-19 emergency **2 versions of the layman's report** were elaborated. The first one was a printed version with the presentation of all the project results (200 copies) and the second one was an online version (<https://www.lifemetroadapt.eu/report/>). This online option was proposed as an alternative to the leaflet second version. There is also an English printed version (50 copies). Both of the layman's reports were promoted during the final events in September, in particular the digital version was presented in the digital corner set up in the event venue.

### *Website*

The **website** has been developed and finalized in two languages (English and Italian). More specifically, the following actions have been undertaken: i) technical construction of the website; ii) Data entry; iii) URL creation; iv) coordination with Legambiente for the graphical element of the website; v) gathering of partners feedback on the website and inclusion of the feedbacks in the website; vi) dissemination of the website through partners' network and social media of ALDA.

As it is possible to observe in the annexed quantitative data, since its launch, the website registered a significant number of visitors which remained quite steady over the months. The website is being maintained and updated in two languages (English and Italian). 121,499 single visit from decembre 2018 to September 2021.

The **"news and events"** session is being constantly updated giving visibility to the project actions and the produced outputs. Since the beginning of the project up to November 2021, 36 **articles** have been published. Furthermore, the "documents and publication" session has been constantly updated through the publication of the project outputs and contents.

### *Newsletter*

According to the approved communication plan, **periodical newsletters** are being edited in Italian and English and all the partners are constantly sharing them with a mailing-list of contacts collected during the project execution and from networking activities.

The newsletter structure has been defined by ALDA in collaboration with the project partners and it is composed by: i) a category about the state of implementation of project activities ("field updates"); ii) a category about the partners' side news and projects ("what else"); iii) a category about partners ("who we are") interspersed with a category about other projects and initiatives on the subject of urban adaptation strategies to climate change ("on going").

Eight newsletters were designed, sent to a selected contact list, and published on the project website, in a dedicated session.

The project newsletter currently counts on 853 subscribers (458 ITA - 389 EN)

In addition to the newsletter, five additional communications were sent to the subscribers:

- 2020-09-07 European Week of Regions and Cities
- 2020-10-01 European Week of Regions and Cities (deadline postponed)
- 2021-02-25 Last days of the Nature of Cities Festival
- 2021-04-21 The Pale Blue Dot
- 2021-06-02 European Green Week

The newsletter was spread through the social media of the project where an invitation to subscribe is constantly published.

### *Social Networks*

The **Facebook** and **Twitter** pages are weekly fed with news coming from the project and from other initiatives and organizations working on climate change adaptation, territorial resilience to climate change, flood risk mitigation and heat islands analysis and reduction.

As of November 2021, the project's Facebook page has a total of 442 followers and 403 likes.

The public of the LMA Facebook page is made up of 50,8% women and 49,2% men, and they are mainly located in Milan (Italy) 20.8%, Rome (Italy) 5% and Bruxelles (Belgium) 2.2%.

As of November 2021, the project Twitter page counts 290 followers. Since the beginning of the project, a total of 392 Tweets - two per week, have been published.

Interactions on the two channels have been implemented and monitored and reactions (messages, likes, sharing) have been provided whenever needed.

Furthermore, a YouTube channel entirely dedicated to the project has been created to give visibility to the produced audio-visual material.

Due to the COVID-19 emergency, to increase the online project promotion an Instagram profile was created in February 2021. At the end of project the followers were 93, posts n.72, published videos n. 5, Stories n. 100.

The **Instagram** profile was used to publish the photos of the participants to the photo-contest and it was the tool for voting the "Special mention" best photo.

On **Youtube** channel 156 web views for final video, 30 web views for Masate video, 203 web views for Solaro, 115 web views project promotional video, 337 web views for the animation video.

### *Press releases and articles*

10 press releases were published:

- I press release for the first presentation of the project (1<sup>st</sup> March 2019)
- II Press release for the launch of the first thematic seminar at the national fair "Fa' la cosagiusta";
- III press release for the launch of the first event of presentation of the LIFE Metro adapt project (May 23<sup>rd</sup>, 2019) and invitation to the media;
- IV press release for the launch of the first theatrical show (September 17<sup>th</sup>, 2019) and invitation to the media for the first theatrical show (September 5<sup>th</sup>, 2019).
- V press release for the seminar "Le cittàsi adattano al climache cambia" and for the performance Pale Blue Dot in occasion of "Scienza in scena" festival (27<sup>th</sup> January 2020)
- VI press release for the online performance "Pale Blue Dot" in English in occasion of the Earth Day (14<sup>th</sup> April 2021)
- VII press release for the online performance "Glialberiballano" (31<sup>st</sup> May 2021)



- VIII press release for the technical visit and seminar in Masate (9<sup>th</sup> June 2021)
- IX press release for the technical visit and seminar in Solaro (21<sup>st</sup> September 2021)
- X press release for the final event (28<sup>th</sup> September 2021)

22 articles presenting the Metro Adapt project or focusing on specific deliverables or events organized by the project were published. 19 of them were published on different kind of media (one national newspaper, online magazine, on line local newspaper), 2 TV reports and 1 radio interview) and seventeen articles were published on the ALDA's website.

Deliverable E1\_D11 reports the project's description and results that have been uploaded on the Climate-ADAPT Platform.

Link: <https://climate-adapt.eea.europa.eu/metadata/projects/enhancing-climate-change-adaptation-strategies-and-measures-in-the-metropolitan-city-of-milan>

## **E1.2 Events and networking activities**

On 14/09/2018 CMM presented Metro Adapt in Zagreb (Croatia) during the final meeting of the MEANING Project (Metropolitan Europeans in Active Network, Inducing Novelities in Governance), collecting letters of interest from three other metropolitan areas: Barcelona, Gdansk and Porto.

On 23/05/2019 CMM organized (with the support of Legambiente) and hosted the Metro Adapt presentation for local and regional stakeholders, as part of the Italian Sustainability Festival. A twin event about the NBS development in urban areas was organized by the project Nature4Cities (CMM is partner of this project too) in the same day and location. This gave the opportunity to the partners of the two projects to share experiences and knowledge during informal activities. The event reached 87 registered stakeholders, coming from: local authorities, universities, associations, companies, professionals, students, citizens.

Regarding the event of the Geospatial community that was scheduled for October 2019, it was deemed useful to postpone it to the summer of 2020 to facilitate the community's interest in the typical seasonality of the "urban heat islands" theme. In addition, in October 2019 e-GEOS presented the project at a large cartographic event held in Trieste (<http://atti.asita.it/ASITA2019/Autori/394.html>) so it was considered more profitable to disperse the events over an arc longer time span.

On 18th November 2020 the project results were presented during Forum Parchi "Resilienza e forestazione urbana: la capacità di risposta delle città alla crisi climatica", Legambiente Lombardia event (online modality).

During the late 2020s, we collaborated a lot with other Metropolitan Cities and the Ministry of Environment, as well as with local universities and research centres, creating an increasingly active network on climate risk issues. We have combined all the information from the different projects we are following, the most important of which is the Life Metro Adapt project, and the collaborations with the different partners in a portal dedicated to the resilient transformation of the territory:



Resilient Territories, which won the Sustainable and Resilient PA 2020 Award [https://www.cittametropolitana.mi.it/Territori\\_resilienti/index.html](https://www.cittametropolitana.mi.it/Territori_resilienti/index.html)

The total effort counted 63 different events in which the Metro Adapt project was presented.

The strong importance given by the Metro Adapt project to local, regional, national and international events, in order to support the creation of a network that could enhance the dissemination of good practice and the maximization of results' replication, the COVID impact had to be mitigated.

Three conferences were planned at national and international level:

- a National conference in Rome, organized by CMM and LegambienteLombardia;
- an international conference in Bruxelles organized by ALDA;
- a Geospatial event in Rome, organized by e-GEOS.

All the events listed above were targeted to the international, technical and policy-maker public. Moreover, a large visibility and the opportunity of side events and networking events were expected, but had to be postponed due to the covid emergency. Due to the COVID-19 crisis it was not possible to organize in-presence events, thus the Metro Adapt consortium replaced some of the foreseen activities with online events.

#### *International Event in Bruxelles*

The first Metro Adapt international event, that was supposed to take place in Brussels, was replaced with the co-organization of the **"Nature of Cities Festival - Better Cities for Nature and All People"** a virtual festival that took place from the 22<sup>nd</sup> to the 25<sup>th</sup> of February. The 5-days event focused on facilitating transdisciplinary dialogue, small group workshops, arts engagement, and fostering a collaborative spirit around solutions for our urban futures. More than **2000 participants** around the world joined the sessions and visited the imagined city created by The Nature of Cities Festival. The Metro Adapt project joined the international event as one of the main co-organizers, proposing a wide variety of activities and sessions:

- The workshop **"Nature-Based Solutions as a means to boost urban climate change adaptation"**, which took place on the 23<sup>rd</sup> of February.
- The virtual field trip **"Nature-Based Solutions in urban areas: A virtual trip in the Milan Metropolitan Area"**, which took place on the 24<sup>th</sup> of February.
- The conversation in the plenary session **"Participation, Local Democracy, and Sustainable Cities"** between Antonella Valmorbida, ALDA's Secretary General, and Mary Rowe, President and CEO of the Canadian Urban Institute, which took place on the 24<sup>th</sup> of February,
- The workshop **"Covenant of Mayors: The Sustainable Energy and Climate Action Plan in Metropolitan Areas"**, which took place on the 25<sup>th</sup> of February.
- The mutual learning **"Pale Blue Dot and the Metro-Theatre: Art as a powerful tool to raise awareness"**, which took place on the 25<sup>th</sup> of February.

Furthermore, participants had the opportunity to interact with the project partners and to discover more information about the Project results within the **LIFE Metro Adapt exhibitor booth** and listen to the **Metro Adapt Micro-Talk**.



### *Final Conference in Milan*

Thanks to Claudia Guerrini's advice, the Metropolitan City of Milan was able to contact the colleagues at the Ministry and apply for Life Metro Adapt events to be included in the Pre-Cop programme, which took place in the final month of the LIFE Metro Adapt project. Precisely on this occasion, taking advantage of the importance of the event and the coincidence of the same in Milan, we organized several days dedicated to LIFE Metro Adapt, as a small thematic review in the field of climate change (see E1\_D13).

The Final Conference in Milan took place over several days. Here are the main events scheduled:

#### 21st of September 2021

- Within the All4Climate - Italy 2021, on the 21st of September the International participatory workshop "**Climate Change Adaptation Strategies In European Metropolitan Areas**" took place involving international stakeholders from several EU countries. The workshop was addressed to national and international local and regional authorities and, specifically, to European metropolitan areas, with the aim of creating a space of dialogue and exchange of good practices of urban climate change adaptation. Furthermore, starting from the climate change adaptation strategy designed by LIFE Metro Adapt, it boosted a co-creation process leading to the co-design of a sustainability plan and to the creation of synergies and future collaboration opportunities among the participants. The webinar has been included among the satellite events of the EU **Covenant of Mayors Ceremony**, strengthening more and more the linkages with the Covenant of Mayors new strategy towards 2050 and was attended by 62 participants.
- The **Exchange meeting with the Climate Knowledge Network (IT)** took place on the 21st of September at Spirit de Milan, Via Bovisasca, 57/59, 20157 Milan, in compliance with the health regulations and the Covid-19 social distancing and individual protection measures in force. The goal of this interesting meeting was to share the Nature-Based Solutions monitoring tool created by the LIFE Metro Adapt Project and to stimulate the creation of synergies among the participants. Total attending participants were 40. A lunch was offered by the project at the end of the meeting.
- The **Nature-Based Solution Walking tour (IT)** took place on the 21st of September. Participants were guided in the visit of some of the most significant Nature Based Solutions realized in the metropolitan area of Milan. The route was as follows: Departure from Spirit de Milan, Via Bovisasca, 57/59, 20157 Milan, i) Sustainable urban drainage system in the municipality of Solaro; ii) Shared vegetable gardens of Parco Segantini; iii) VascaVolano, Velodromo Parco Nord, Arrival at Spirit de Milan, Via Bovisasca, 57/59, 20157 Milan/Milan Centre. A welcome coffee were offered before leaving. Live guided tours took place with a limited number of participants and upon registration, in compliance with the Covid-19 health and social distancing and individual protection measures in force.(16 participants)

#### 24th of September

- The theatre show **PALE BLUE DOT – PALLIDO PALLINO BLU** was presented at the Piccolo Teatro Grassi, Via Rovello 2, 20121 Milan (MI). A Jet Propulsion Theatre show by the Arditodesio Theatre Company. An incredible story of hope, wonder, and beauty, by and with Andrea Brunello, directed by Christian Di Domenico, music by Enrico Merlin. The evening was introduced by the Metropolitan



City of Milan and Legambiente Lombardia. After the show, participants will have the opportunity to dialogue with Andrea Brunello and the Project Team (175 participants)

#### 28th of September

- On the 28th of September the **Final Conference of the Life Metro Adapt project** took place at Spirit de Milan, Via Bovisasca, 57/59, 20157 Milan (It was also possible to follow the plenary sessions online, through the GoToMeeting platform). The project partners presented the achieved results and the sustainability plan of the project, to give continuity to the process started, through the adoption of climate change adaptation measures and strategies in the metropolitan area of Milan. Afterward, participants were invited to share their knowledge and experience in three focus groups: i) Knowing the climate; ii) Climate change adaptation; iii) Communicating the climate. Participants were then invited to lunch together. This was followed by a moment of restitution of the results of the work in the plenary session. (65 participants)
- On the 28th of September the Photo contest awarding event was held at Spirit de Milan, Via Bovisasca, 57/59, 20157 Milan. It was the award ceremony for the winners of the photo contest "PhotoAdapt – The impacts of climate change in the Metropolitan City of Milan". Contestants and their companions (maximum 2 per person) was offered an aperitif. The event was also streamed on the Facebook page of the Metro Adapt project. (39 participants)

In addition to the events directly organized by Metro Adapt, the partners participated in dissemination and networking events in order to create synergies and interesting contacts with projects, international organizations, public entities, representatives of the private sectors, institutions and key stakeholders who could be interested in the project focus and thematic. To keep track of the created contacts, a shared synergy sheet has been shared among partners to allow them to suggest relevant stakeholders and the relative actions to undertake.

The total amount of events participated by the project is 63, national and international. The involvement effort counted 1040 people in total: thematic on-line events (242 participants) and live (120 participants) seminars; local groups' seminars (281 participants); live events in Milan (397 participants). Conferences and workshops organized at international (more than 1162) and national level (more than 2603) and with the other Italian metropolitan cities (90) counted a total amount of 3855 networking single contacts.





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## Partner



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### CONTATTI:

Website: [www.lifemetroadapt.eu](http://www.lifemetroadapt.eu)



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