LIFE Project Number

LIFE17 CCA/SK/000126 - LIFE DELIVER

Final Report

Covering the project activities from 15/06/2018[1] to 15/12/2023

Reporting Date[2]

15/03/2024

LIFE PROJECT NAME or Acronym

DELIVER - DEveloping resilient, low-carbon and more LIVablE urban Residential area

Data Project

Project location:	Bratislava, Slovakia
Project start date:	15/06/2018
Project end date:	15/06/2023 **Extension date:** 15/12/2023
Total budget:	2 446 523,00 € - Grant Agreement, 2 460 765,06 - Cost claimed
EU contribution:	1 467 913,80 €
(%) of eligible costs:	100,58 % (increased co-financing)

Data Beneficiary

Name Beneficiary:	Bratislava Karlova Ves Municipality
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Project Website:	www.odolnesidliska.sk

[1] Project start date

[2] Include the reporting date as foreseen in part C2 of Annex II of the Grant Agreement

This table comprises an essential part of the report and should be filled in before submission

Please note that the evaluation of your report may only commence if the package complies with all the elements in this receivability check. The evaluation will be stopped if any obligatory elements are missing.

Package completeness and correctness check	
Obligatory elements	**✓ or N/A**
Technical report	
The correct latest template for the type of project (e.g. traditional) has been followed and all sections have been filled in, in English *In electronic version only*	✓
Index of deliverables with short description annexed, in English *In electronic version only*	✓
Final report: Deliverables not already submitted with the MTR annexed including the Layman's report and after-LIFE plan. Deliverables in language(s) other than English include a summary in English - **already submitted via BUTTLER** *In electronic version only*	✓
Financial report	
The reporting period in the financial report (consolidated financial statement **and** financial statement of each Individual Beneficiary) is the same as in the technical report with the exception of any terminated beneficiary for which the end period should be the date of the termination.	✓
Consolidated Financial Statement with all 5 forms duly filled in and signed and dated *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets + full Excel file)*	✓
Financial Statement(s) of the Coordinating Beneficiary, of each Associated Beneficiary and of each affiliate (if involved), with all forms duly filled in (signed and dated). The Financial Statement(s) of Beneficiaries with affiliate(s) include the total cost of each affiliate in 1 line per cost category. *In electronic version (pdfs of signed sheets + full Excel files) + in the case of the Final report the overall summary forms of each beneficiary electronically Q-signed or if paper submission, signed and dated originals**	✓
Amounts, names and other data (e.g. bank account) are correct and consistent with the Grant Agreement / across the different forms (e.g. figures from the individual statements are the same as those reported in the consolidated statement)	✓
Mid-term report (for all projects except IPs): the threshold for the second pre-financing payment has been reached	N/A
Beneficiary's certificate for Durable Goods included (if required, i.e. beneficiaries claiming 100% cost for durable goods) *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets)*	✓
Certificate on financial statements (if required, i.e. for beneficiaries with EU contribution ≥750,000 € in the budget) *Electronically Q-signed or if paper submission signed original and in electronic version (pdf)*	✓
Other checks	
Additional information / clarifications and supporting documents requested in previous letters from the Agency (unless already submitted or not yet due) - **already submitted** *In electronic version only*	N/A
This table, page 2 of the Final report, is completed - each tick box is filled in *In electronic version only*	✓

**signature by a legal or statutory representative of the beneficiary / affiliate concerned*

1. Table of contents

2. List of key-words and abbreviations

Key words: climate change, mitigation, adaptation, biodiversity, CO_2 emissions, deep renovation, energy efficiency, resilience, vulnerability, vulnerability assessment, energy savings potential, buildings renovation, nearly zero energy buildings, renewable energy sources, sustainable architecture, carbon neutrality, global warming, green infrastructure, nature-based solutions

List of abbreviations:

AB	Associated beneficiary
BA-KV	Bratislava-Karlova Ves
BCCO	Bratislava Capital City Office
BROZ	BROZ - ochranárske združenie (BROZ - conservation association)
CB	Coordinating beneficiary
CC&E	Covenant for Climate and Energy
CDI	Karpatský rozvojový inštitút (Carpathian Development Institute)
CENIA	Czech Environmental Information Agency
CENIA	Česká informační agentura životního prostředí (Czech Environmental Information Agency)
Climate - ADAPT	European Climate Adaptation Platform
AB	Associated beneficiary
BA-KV	Bratislava-Karlova Ves
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CENIA	Česká informační agentura životního prostředí (Czech Environmental Information Agency)
Climate - ADAPT	European Climate Adaptation Platform
CoCliBEC	COmmunity Climate and Biodiversity Educational Centre
CoopAgr	Cooperation Agreement
CR	Czech Republic
CReLoCa AP	Climate Resilient Low Carbon Action Plan
CReLoCaF	Climate Resilient Low Carbon Factor (Klimasken)
EDZ	Educational and demonstration zones
FB	facebook
CHoA	Chamber of Architects
IEPD	Inštitút pre pasívne domy (Institute for Passive Houses Slovakia)
JgS	Jurigovo Square
KV	Karlova Ves
KVC	Community Education Center for Climate and Biodiversity (CoCLIBEC);
MA	Municipal Assembly
MAC	Municipal Assembly Commissions
MC	Municipal Council
MeE CR	Ministerstvo životního prostředí ČR (Ministry of Environment of the Czech Republic)
MO	media output
MoCT SR	Ministry of construction and transport of the Slovak Republic
MoE CR	Ministry of the Environment of the Czech Republic
MoE SR	Ministry of the Environment of the Slovak Republic
MSK	Kindergarten Koliskova 14, Bratislava
Mun-BA-KV	Municipality Bratislava-Karlova Ves
MUWOG	MUltiprofesssional WOrking Group
PHPP	Passive House Planning Package
PvF UK	Prírodovedecká fakulta Univerzity Komenského (Faculty of Natural Sciences, Comenius University)
SG	Steering group of the project
SHMÚ	Slovenský hydrometeorologický ústav (Slovak Hydrometeorological Institute)
SCHoA	Slovenská komora architektov (Slovak Chamber of Architects)
SCHoCI	Slovenská komora stavebných inžinierov (Slovak Chamber of Civil Engineers)
SR	Slovak Republic
SUDS	Sustainable Urban Drainage System
UTCS	Union of Towns and Cities of Slovakia
WS	workshop
ZSAD	Primary school A. Dubčeka, Majernikova 62, Bratislava

Project beneficiaries:

- Bratislava Karlova Ves Municipality - Mestská časť Bratislava-Karlova Ves

- Bratislavské regionálne ochranárske združenie BROZ (Regional Association for Nature Conservation and Sustainable Development *
- CDI - Karpatský rozvojový inštitút (Carpathian Development Institute)
- CI2 - CI2, o.p.s, (CI2 - private non-commercial)
- iEPD - Inštitút pre pasívne domy (Institute for Passive Houses Slovakia)

*new name BROZ – ochranárske združenie/conservation association from 23.2. 2023

Stakeholders:

MoE SR	Ministerstvo životného prostredia SR (Ministry of Environment of the Slovak Republic)
MoCT SR	Ministerstvo dopravy a výstavby SR (Ministry of construction and transport)
SCHoA	Slovenská komora architektov (Slovak Chamber of Architects)
SCHoCI	Slovenská komora stavebných inžinierov (Slovak Chamber of Civil Engineers)
SHMÚ	Slovenský hydrometeorologický ústav (Slovak Hydrometeorological Institute)
MeE CR	Ministerstvo životního prostředí ČR (Ministry of Environment of the Czech Republic)
CENIA	Česká informační agentura životního prostředí (Czech Environmental Information Agency)

3. Executive Summary (maximum 2 pages)

Briefly describe the project objectives, key deliverables and outputs.
Compare in a few paragraphs the activities planned to the progress made. Summarise the achievements, deviations, important problems and difficulties met during the project implementation. This summary should be a stand-alone text.

The project aimed to balance adaptation and mitigation efforts in residential areas dominated by concrete prefabricated buildings. The goal was to enhance their climate resilience, reduce their carbon footprint, and promote biodiversity. To achieve this, the project established five specific objectives. These objectives ranged from raising knowledge in relation to the climate resilience assessments to promoting and demonstrating an integrated adaptation and mitigation approach. Finally, the project aimed to influence the national climate legislative environment.

The **main results, key deliverables and outputs** of the project achieved to reach these objectives are as follows:

1. The new user-friendly **on-line tool Klimasken** (C1) for consolidated climate resilience and carbon footprint assessment is available through the web page: https://www.klimasken.cz). Klimasken was developed and successfully tested in eight cities and municipalities: Slovakia: Bratislava Municipality Karlova Ves, Hlohovec, Prešov, Košice, Czech Republic: Prague, Opava, Holice and Třebíč. The tool is available in English, Czech, and Slovak languages.
2. The **Climate Action Plan** adopted by Bratislava Municipality Karlova Ves incorporates both mitigation and adaptation strategies. To involve local residents, the plan utilised an interactive "feelings map." The results of this map helped assess the community's vulnerability to climate change impacts. Additionally, two preliminary studies were conducted: thermal mapping and pluvial flood risk modelling. These studies provided data on exposure to climate hazards, which is a key component of

vulnerability assessment. Furthermore, the plan calculated the carbon footprint of the municipality and established short-term and long-term goals for carbon emission reduction.

3. The **Catalogue of adaptation and mitigation options** (C2) helped while drafting the adaptation and mitigation measures. The catalogue provides a clear and concise overview of recommended measures that will help to better understand the relationships between mitigation, adaptation, and biodiversity. Its aim is primarily to present synergistic measures that have both an adaptation and mitigation impact (whether positive or negative), and thus to assist municipalities in finding suitable solutions and measures for climate change mitigation and adaptation.
4. **Architectural studies for the deep refurbishment of two prefabricated concrete panel residential buildings** (C4) were completed and presented. The studies focused on both climate change aspects (adaptation and mitigation). PHPP calculations were performed for both the refurbished and non-refurbished buildings to quantify the potential energy savings for the residential housing stock in Bratislava Karlova Ves. This quantified data was then used to set emissions reduction targets within the Climate Action Plan.
5. Two public buildings, primary school "Alexander Dubcek" and the kindergarten at Koliskova street (C3), underwent a **deep green renovatio**n that incorporated both mitigation and adaptation options, including the use of prototype solutions. The prototype nature of the renovation project stems not only from the comprehensive approach taken, which balanced adaptation and mitigation measures while considering educational value, but also from the innovative ventilation system. This system utilises nature-based solutions to bring fresh, cooled air into the kindergarten building. The success of these 2 public buildings renovation is intended to serve as a model for similar public building renovations across Slovakia.
6. Concrete demonstrations of various **adaptation measures** were implemented in **open spaces**, with the additional benefit of **enhancing biodiversity** (C5, C6). These demonstrations were primarily located in the Majernikova sports and recreation area and the Kaskady open space. Examples of these measures include: creation of new, small, artificial wetlands/ponds, installation of bird boxes, hedgehog shelters, lizard basking areas, apiaries, and insect hotels, creation of flowering meadows, planting of native trees, restoration of a fruit and herb garden on school grounds, installation of new green roofs and walls etc. These combined efforts serve as a model for incorporating adaptation strategies while promoting biodiversity in urban areas.
7. The **Community Climate and Biodiversity Educational Centre** (C7) was opened and will serve especially to the local community. The centre will support community life, educate and raise awareness among the community,students, professionals and the general public about climate change issues. Visitors will learn about ways to mitigate the effects of climate change and adapt to its consequences, as well as the need to preserve and promote biodiversity.

Encountered problems and difficulties:

The process of the data collection took more time than expected (needed for activities C.1. and C.2.), especially on heat, gas, electricity, fossil fuel consumption, the number of air conditioners used, freight transport, water consumption, amount and composition of municipal waste, e.g. the largest electricity supplier, ZSE, a.s., refused to provide us with data on consumed electricity.

We encountered challenges implementing action C5 in the originally chosen location, Jurigovo Square, the most neglected open space in the area. Even this square is located within the municipality, ownership belongs to Bratislava capital city. This ownership issue, combined with limitations on municipal investment (only permitted on municipally owned property), led to a change in the demonstration site -open space and the Kaskady open space was ultimately selected to showcase the adaptation measures.

The global crisis caused by the COVID19 pandemic has resulted in extreme market price increases, especially in the construction sector. It is a well-known fact that prices on the building materials market have risen at record levels and they were therefore incomparably higher than at the time of preparation, submission and approval of applications and subsequently at the signing of project contracts. Due to the high complexity of the deep renovation and limited financial resources, it was necessary to divide the work into several stages. The work was therefore carried out gradually, depending on the current state of the pooled resources.

4. Introduction (maximum 2 pages)

- Description of background, problems and objectives (as foreseen in the proposal)
- Climate related problem/issue addressed

Cities worldwide consume over two-thirds of the world's energy and account for more than 70% of global CO_2 emissions. Moreover, cities are at high risk from some of the devastating impacts of climate change, such as summer heat waves, long periods of drought altering with heavy rains and storms. On the other hand, cities are not only the part of the climate change challenges, cities also have the opportunity or the responsibility to be an integral part of the possible solutions.

One of the principal reasons of the Bratislava Municipality Karlova Ves high level of vulnerability is that the settlement structure is formed in major part by residential areas consisting of prevailingly prefabricated buildings. Such residential areas might be characterised with some common features: very densely populated urban area with poor quality open spaces, the low construction quality and high energy demand of residential and public buildings , lack of knowledge and practical examples of options for adaptation and mitigation particular in this kind of residential areas, lack of simple tool to measure, evaluate and present information in very easy and friendly way about the adaptation and mitigation current status, progress and partial activities of cities, city areas, and individual buildings is missing at all.

- Outline the solution to be demonstrated / verified by the project

The project involves a demonstration aspect through the complex approach in the view of balancing adaptation and mitigation goals with regards to biodiversity promotion in the residential area with prevailingly prefabricated concrete buildings. The special focus, to find the synergic effects in the way to increase the climate resiliency and at the same time to promote biodiversity through the „ nature based solutions" was originally expected (and was proved and verified by the project).

- Description of the technical / methodological solution

The project seeks to identify concrete activities that can provide potential solutions to the aforementioned problems:

- Developing and testing the innovative on-line tool (Klimasken - CReLoCaF) for monitoring, evaluating, managing and presenting information on adaptation and mitigation activities of cities, city areas, and individual buildings. The Catalogue of adaptation and mitigation options, that is adequately addressing the adaptation, mitigation and biodiversity protection in balanced way
- The demonstrations projects - pilot refurbishment of 2 public buildings and pilot demonstration renovation of the 2 open spaces in order to increase the climate resilience with regard on biodiversity
- Elaboration of the Climate action plan (CReLoCa AP) where CO_2 emissions reduction target and adaptation options are included in balanced way using the participatory approach
- Creation of the Educational and demonstration Center to promote climate change adaptation and mitigation via interactive means
- Elaboration the suggestions to amend and change the legislative conditions and the missing standards in the field of SUDS

- Expected results and climate action related benefits

- Knowledge base in the area of common consolidated climate resilience and carbon footprint assessment increased (through developed and tested tool "Klimasken")
- The integrated adaptation and mitigation approach with emphasis on eco-based adaptation solutions and biodiversity promotion in strategic planning and in the reconstruction/refurbishment work of buildings and open spaces demonstrated (especially through developed "Climate Action Plan" and pilot refurbishment of public buildings and open spaces)
- Awareness of local community, students, professionals and the general public about climate change issues increased and more climate resilient community created (especially through the dissemination activities, eco-consultancy, activities in the Community centre for climate and biodiversity etc.)

- Expected longer term results (as anticipated at the start of the project)

The project is exactly addressing the topic of climate resilience by its actions towards balancing mitigation and adaptation measures in different ways and is contributing to the European Union climate action policy and EU biodiversity policies and legislation as follows:

1. it develops and implements local adaptation and mitigation initiatives and therefore is strongly related to the EC Initiative "Covenant of Mayors for Climate and Energy"
2. it contributes to climate adaptation and mitigation and biodiversity objectives in urban areas
3. it promotes green infrastructure (through green roofs and green spaces, improving permeability of urban surfaces)

The concrete activities supporting to the European Union climate action policy and EU biodiversity policies and legislation were:

1. through the „Klimasken" the on-line tool for monitoring, evaluating, managing and presenting information on adaptation and mitigation current status, progress and partial activities of cities, city areas, and individual buildings development that will improve the knowledge base for the development, assessment, monitoring, evaluation and implementation of effective climate change adaptation actions. The Klimasken tool was already quoted in the "EU-level technical guidance on adapting buildings to climate change" among the identified building resilience rating approaches.
2. through the Climate Action Plan (CReLoCa AP) that will facilitate the development and implementation of integrated adaptation and mitigation approaches with regards to biodiversity promotion
3. through the realisation of innovative projects in the field of public buildings and open spaces retrofitting that will demonstrate the solutions for climate change adaptation, including ecosystem-based approaches and biodiversity promotion and to contribute to the development innovative climate change adaptation technologies, that could be replicated the similar residential areas across Europe

The Deliver project directly contributes to achieving greenhouse gas emission reduction targets set by both the Paris Agreement (at least 40% reduction by 2030) and the EU Green Deal (at least 55% reduction by 2030, compared to 1990 levels).

This contribution is achieved through two main approaches:

- Direct Actions: Implementing concrete investments and piloting demonstration actions on public buildings and open spaces (as outlined by the project's KPIs related to the Co2 emissions reduction).
- Indirect Influence: Providing guidelines, sharing best practices, information, and experiences with cities in Slovakia, Czech Republic, and beyond. This knowledge transfer allows cities with similar residential areas to potentially replicate the Deliver project's successful strategies.

5. Administrative part (maximum 1 page)

Please briefly describe the following issues:

- The project management process, the working method, the problems encountered, the partnerships and their added value, including comments on any significant deviations from the work plan.

The overall coordination of the project was covered by CB – Mun-BA-KV. In the cooperation agreement there is clearly stated for which activities are AB responsible. Overall administrative coordination of the whole project, including reporting was covered by CB – Mun-BA-KV. Each AB has been responsible for every-day time registration (if needed), inner administrative procedures – e.g. selection of supplier, planning of procurements, realisation of actions, accounting etc. All documents produced by AB within the project time frame were checked for correctness and appropriateness to project by employees of CB. The meeting of **Steering group** (SG) was organised by CB, once a year. The SG has been checking the progress of the project, helping to resolve difficulties in implementation and helping to ensure dissemination of the project results. Steering group met four times.

Project management on behalf of CB and Project Partners is described in detail in Annex F.1._24.

- Communication with the Agency and Monitoring team.

The communication with CINEA and monitoring team form EASME/ELMEN EEIG consortium was ensured through the CB – Mun-BA-KV. The issues were regularly discussed ad – hoc during the project, by e-mail or by phone or on project monitoring visits. Communication with CINEA/EASME/ELMEN EEIG was smooth and helpful, all questions about interpretation of the financial and administration rules were promptly answered. From 01/05/2023 the service via LIFE Monitoring Helpdesk was used.

- The changes due to amendments to the Grant Agreement.

An extension of the duration of the project was approved by 6 months - from the foreseen end date of June 15, 2023 to the date of December 15, 2023.

6. Technical part (maximum 25 pages)

6.1. Technical progress, per Action

A.1. Preparatory actions to the demonstration activities and implementation of concrete innovative measures on public buildings

Foreseen start date: June 2018 Actual start date: October 2018
Foreseen end date: September 2019 Actual end date: March 2021
Beneficiary responsible for implementation: Mun-BA-KV

A.1.1. Detailed technical project (blueprint) preparation ZSAD

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.3 - The technical project (blueprint) for ZSAD**
Deliverable foreseen: March 2019 Deliverable no.3 completed: September 2019
Progress achieved: **completed.** The detailed technical project (blueprint) for ZSAD was completed in September 2019 (Annex A.1.1._1, Annex A.1.1._2)
Problems, solutions, delays, and the impact on the other actions depended on this action: The preparation of the baseline document for public procurement (design brief: Enhancing energy efficiency and educational environment in Primary School of A. Dubcek, Majernikova 62, Bratislava) started in June 2018 and was completed in October 2018. The call for public procurement was published in December 2018 (Annex A.1.1._3). No proposals were submitted by the deadline of 31 January 2019, nor by the postponed deadline of 15 February 2019. The new call was launched on 20 March 2019. The contractor was awarded in April 2019 and the contract signed in May 2019 (Annex A.1.1._4). The detailed technical documentation (blueprint) was controlled, consulted and amended by members of MUWOG in September 2019.

A.1.2. Construction permits procedures (for ZSAD and MS Koliskova)

Status of the sub-action: completed
Deliverable/milestone: **milestone no.9 - Construction permits obtained (for ZSAD and MS Koliskova)**
Milestone foreseen: June 2019 Milestone no.9 completed: October 2020
Progress achieved: **completed.** For the kindergarten (MSK), the building permit by the Construction Office became legally valid on 23 July 2020 (Annex A.1.2._1), for the primary school (ZSAD) on 26 October 2020 (Annex A.1.2._2). This was preceded by obtaining the necessary authorisations from the following institutions: Technical Inspection; Fire and Rescue Unit; Regional Public Health Office; Bratislava District Office, Department of Environmental

Care, Nature and Landscape Protection; Bratislava District Office, Department of Environmental Care, State Water Administration; Bratislava District Office, Department of Environmental Care, Waste Management; Západoslovenská distribučná, a. s.; Construction Office.
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay in this activity was caused by the delay of activities A.1.1. and A.1.4. The technical project for the primary school (ZSAD) was completed in September 2019 and for the kindergarten (MSK) in July 2019. The process of obtaining building permits started in October 2019 and it was slowed down by the outbreak of COVID-19.

A.1.3. Preparation and realisation of the contractor´s selection
Status of the sub-action: completed
Deliverable/milestone: **milestone no.10 - Tender documentation for the construction provider prepared (ZASD, MSK)**
Milestone foreseen: June 2019 Milestone no.10 completed: March 2021
Progress achieved: **completed.** In February 2020, we approached 7 companies to submit a price offer for the implementation of the public procurement for the contractor for the reconstruction of the kindergarten (MSK) and primary school (ZSAD) buildings (Annex A.1.3._1). In March 2020, the contracts with the winner, Zita Smitkova-JADEZIT, for the implementation of the public procurement for the contractor of the reconstruction of the kindergarten (MSK) (Annex A.1.3._2) primary school (ZSAD) (Annex A.1.3._3) buildings were signed. The public procurement for the reconstruction of the MSK was announced on August 18, 2020 (Annex A.1.3._6, A.1.3._7), and for the ZSAD on October 28, 2020 (Annex A.1.3._8, A.1.3._9).The winner for reconstruction of both buildings become the company SOAR, spol.s r.o.
The framework contract with this company was signed in the case of the kindergarten building reconstruction (MSK) in November 2020 (Annex A.1.3._4) and in the case of the primary school building reconstruction (ZSAD) in March 2021(Annex A.1.3._5).
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay was caused by: a) delays in preparation of the technical projects (blueprints) - three months in case of the kindergarten and eight months in case of the primary school, b) an obligation to have the financial coverage in the approved Mun-BA-KV budget before the publication of the call for tenders and therefore we needed to ask the MA for a BA-KV budget change. The MA was supposed to decide on the budget change at its meeting in March 2020, which, however, did not take place due to the coronavirus crisis. Finally, MA approved the budget changes on 30 June 2020. Only after fulfilling these steps could the tender be announced and the contractor selected.

A.1.4. Revision of the detailed technical project (blueprint) preparation for MSK
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.34 supplement - The detailed technical project (blueprint) for MSK revised**
Deliverable supplement foreseen: July 2019 Deliverable no.34 supplement completed: July 2019
Progress achieved: **completed.** The revision of the detailed technical project (blueprint) for the kindergarten (MSK) was completed in July 2019 (Annex A.1.4._1, Annex A.1.4._2)
Problems, solutions, delays, and the impact on the other actions depended on this action: The revision of the blueprint was made on the basis of consultations with MUWOG to incorporate the innovative solutions. The delay was caused by the delay of the public procurement due to the unacceptably high estimated value of the contract. The solution was found in the adjustment

of the subject of the contract. The call for low-value tenders was published between January and February 2019.

A.2. Preparatory action of concrete innovative measures on open public space with public participation method in the pilot residential areas of Bratislava Municipality Karlova Ves

Foreseen start date: September 2018 Actual start date: September 2018
Foreseen end date: August 2019 Actual end date: May 2021
Beneficiary responsible for implementation: Mun-BA-KV

A.2.1. Planning phase of the demonstration open space renovation with participatory approach

Status of the sub-action: completed
Foreseen start date: September 2018 Actual start date: September 2018
Foreseen end date: May 2019 Actual end date: December 2019 (Jurigovo nám.)
Actual end date: March 2021 (Kaskady)

Progress achieved: **completed.** We started this activity by elaboration of principles and criteria for the renovation of public spaces (Annex A.2.1._1), then we carried out the participative planning for the square Jurigovo nám. After finding out that this square needs a complex renovation, not just the renovation of its central part planned by us, we choose an alternative public space, the Park Kaskády.

A) Participative planning of renovation of the originally chosen public space - square Jurigovo nám. was completed in December 2019.

The selection of a suitable public space took place from September to December 2018. The preparation of the public procurement for the participatory process started in January 2019 (Annex A.2.1._2) and was completed in March 2019 (Annex A.2.1._3). From April to mid-May 2019, residents could participate in the survey through a questionnaire (Annex A.2.1._4). The aim was to find out how they use the square Jurigovo nam. and how they perceive its current status and functionality. The first public meeting with residents was organised in the form of an urban walk on 28 May 2019 (Annex A.2.1._5). The second meeting with the inhabitants took place in the local library Karloveska kniznica on 27 June 2019 and it took the form of a workshop (Annex A.2.1._6). The conclusions of the process were summarised in the Report from public participation in the preparation of the revitalization of the square Jurigovo namestie (Annex A.2.1._7 and A.2.1._8). The third, final meeting with the public, where the project for reconstruction of the square before it is finalised was presented was held on 29 November 2019 (Annex A.2.1._9).

B) Participative planning of renovation of the alternative public space - Park Kaskady was done in March 2021.

Anti-pandemic measures did not allow us to meet the residents from the vicinity of Park Kasakády personally. We presented them the model of rain water retention measures and answered their question online on March 10, 2021 (Annex A.2.1._10).

Problems, solutions, delays, and the impact on the other actions depended on this action: The postponement of the start of this activity was caused by complications in the selection of an appropriate public space. The owner of the selected square Jurigovo nám. is BCCO. This had an impact on the activities D.2.1. First Monitoring Report, A.2.2. Detailed technical project (blueprint) for public space and A.2.3. All relevant permits (for public space) obtained. Even though the originally planned renovation of the A) public space: Jurigovo námestie could not proceed further in the frame of the project, the results of the participatory process were not wasted, as they were used for further steps by the BCCO in connection with the planned

complex renovation. After consultation with the external monitor of the project we chose another alternative public space and the participative approach was applied.

A.2.2. Detailed technical project (blueprint) for public space preparation
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.5 - Detailed technical project (blueprint) for public space**
Deliverable foreseen: May 2019
Deliverable no.5_1 completed: December 2019 (square Jurigovo nam.)
Deliverable no.5_2 completed: May 2021 (Park Kaskady)
Progress achieved: **completed.** The detailed technical project (blueprint) for the square Jurigovo nám. was completed in December 2019 (Annex A.2.2._1), for Park Kaskády in May 2021 (Annex A.2.2._2). The process of the public procurement for the square Jurigovo nám. was completed in October 2019 (Annex A.2.2._3) and the contract with the winner of the public procurement was signed in November 2019 (Annex A.2.2._4). In the case of the alternative public space, the Park Kaskády, the public procurement was completed in January 2021 (Annex A.2.2._5) and the contract with the winner signed in February 2021 (Annex A.2.2._6).
Problems, solutions, delays, and the impact on the other actions depended on this action, plan to catch up: The postponement of the start of this activity was caused by complications in the selection of appropriate public space and the delay of the activity A.2.1. Public participatory process (see details in A.2.1.).

A.2.3. Reconstruction permits procedure (for public space)
Status of the sub-action: completed (alternative public space Park Kaskady)
Deliverable/milestone: **milestone no.12 - All relevant permits obtained (for public space)**
Milestone foreseen: August 2019 Milestone completed: April 2021 (Park Kaskady)
Progress achieved: **completed.** In March 2021, we sent the Building Office a notification of minor construction and maintenance work together with project documentation (simple landscaping, greenery modifications, small water devices to slow down runoff and trap surface rainwater into underground tanks and wetland flower beds in order to increase evaporation, to cool the microclimate and combat drought in the public space Park Kaskady) (Annex A.2.3._1). In the same month, we received approval from the owner of the Kaskady Park land, BCCO, to place the underground rainwater collection tanks (Annex A.2.3._2). In April 2021, the Bratislava District Office, the Department of Environmental Care, the Department of Nature Protection and selected environmental components informed us that the implementation and use of the proposed construction is possible from the point of view of water protection (Annex A.2.3._3).
Problems, solutions, delays, and the impact on the other actions depended on this action: The postponement of the start of this activity was caused by complications in the selection of appropriate public space and the delay of the activity A.2.1. Public participatory process (see details in A.2.1.).

C.1. Development and testing Climate Resilient Low Carbon Factor (CReLoCaF = KLIMASKEN)
Foreseen start date: July 2018 Actual start date: July 2018
Foreseen end date: December 2019 Actual end date: April 2021
Beneficiary responsible for implementation: CI2

C.1.1. State of the art analyses, literature research and review of existing tools, indicators and evaluation system

Status of the sub-action: completed
Deliverable/milestone: **milestone no.3 - Desk study: Results of literature research and evaluation of existing methods**
Milestone foreseen: October 2018 Milestone no.3 completed: January 2019
Progress achieved: **completed.** The desk study: Results of literature research and evaluation of existing methods was completed in January 2019 (Annex C.1.1._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: There were no major issues to solve. The publication date of the desk study was extended by 3 months against the original timetable. The reason was the magnitude of the literature review for up-to-date sources and the larger scope of the study than expected.

C.1.2. Description of the Climate Resilient Low Carbon Factor Assessment tool (CReLoCaF=KLIMASKEN) including methodology

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.8 - Climate Resilient Low Carbon Factor Assessment tool (CReLoCaF) including methodology and description** elaborated
Deliverable foreseen: June 2019 Deliverable no.8 completed: September 2019
Progress achieved: **completed.** Climate Resilient Low Carbon Factor Assessment tool (named KLIMASKEN) including methodology and description was completed in September 2019 (Annex C.1.2._1). This annex contains tool specifications and assignments for programming in Slovak language. The structure and content of the instrument was created for three levels (city, district, building). Furthermore, suitable initiators were selected to assess mitigations and adaptations at given levels. A methodology for their monitoring was developed for all indicators. In the next steps, the indicators were tested in pilot cities and further developed.
Problems, solutions, delays, and the impact on the other actions depended on this action: The preparation of development of the tool was more demanding than originally planned. Technical setting was quite difficult for the preparation and implementation of public procurement.

C.1.3. Development of the user-friendly application of CReLoCaF (KLIMASKEN) usable on computers through web interface

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.10 - software application of CReLoCaF (KLIMASKEN) usable on computers through web interface** developed
Deliverable foreseen: August 2019 Deliverable no.10 completed: February 2020
Progress achieved: **completed.** The software application of CReLoCaF (KLIMASKEN) usable on computers through web interface was completed in February 2020 (Annex C.1.3._1). The online tool decided to be called KLIMASKEN is functional and fine-tuned by testing with cities. The public procurement for the CReLoCaF (KLIMASKEN) programmer was closed in October 2019 (Annex C.1.3._2) and the contract with the winner of the procurement was signed in November 2019 (Annex C.1.3._3). The web page of KLIMASKEN: https://www.klimasken.sk, https://www.klimasken.cz.
Problems, solutions, delays, and the impact on the other actions depended on this action: The preparation of development of the tool was more demanding than originally planned. Technical setting was quite difficult for the preparation and implementation of public procurement.

C.1.4. Testing CReLoCaF in the pilot residential areas

Status of the sub-action: completed
Deliverable/milestone: **milestone no.8 - Tier residential areas of other Covenant for Climate and energy signatory cities in Slovakia and Czech Republic mandated**
Milestone foreseen: March 2019 Milestone no.8 completed: March 2021

Progress achieved: **completed.** In January 2019, selected cities were approached in cooperation with the Union of Towns and Cities of Slovakia. A memorandum of joint intent, on the basis of which the cities committed to cooperate in testing the online KLIMASKEN tool, was after negotiations signed with these cities:
-Slovak Republic: Hlohovec, in October 2019 (Annex C.1.4._1), Prešov, (Annex C.1.4._2). The city of Košice did not sign the Memorandum, but in December 2020 committed to provide synergies in testing the on-line tool (Annex C.1.4._3).
-Czech Republic: Prague, in January 2020 (Annex C.1.4._4), Holice, in November 2020 (Annex C.1.4._5), Třebíč, in March 2021 (Annex C.1.4._6). The City of Opava did not sign the Memorandum, but provided comprehensive data for testing the tool in October 2020. The Memorandum was signed also by the neighbourhood association Homolka-Motol in November 2019 (Annex C.1.4._7). The political representatives of Nový Jičín agreed to cooperate and engage in the project on the basis of a long-term partnership with CI2, without concluding a formal memorandum. KLIMASKEN was also used to assess the climate resistance of particular residential buildings. These include a new-build terraced house, Prague - Slivenec; a new-build family house in Ondřejov, Central Bohemia Region; a reconstructed family house in Beroun (1950), Central Bohemia Region, an insulated panel house (1970, insulation 2012), Prague - Chodov and new residential building in Prague 6 (developer's investment plan from 2022).
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay was caused by the postponement of the development of the online tool and the more complex negotiations with the cities that needed to become more familiar with the principle of the tool. Moreover, COVID-19 crisis affected the cooperation with the cities in Slovakia as the local governance was overwhelmed by implementing anti-pandemic measures. From the start, the city office of Prešov had a lack of expert capacities to cooperate on the project and on testing the CreLoCaF tool and in addition, during the project some personnel changes occurred that affected the cooperation. CDI was regularly in touch with responsible city officers and made an effort to accelerate the cooperation again. Eventually a temporary intern was employed by the city of Prešov that enabled to complete the process of data collection in the second half of 2020. The data collection for the city of Hlohovec was also completed in the second half of 2020. On the other hand, the cooperation with Košice started, where after the preparatory discussion with the representatives of the city of Košice about potential cooperation and testing the tool, they accepted. The data relevant to the Klimasken were collected from the Košice city´s application for European Green Capital v 2020 and completed by cooperation with the city office in the beginning of 2021.

C.1.5. Replication of CreLoCaF (KLIMASKEN) in the tier cities

Status of the sub-action: completed
Deliverable/milestone: **milestone no.11 - Input to the European Climate Adaptation Platform (Climate - ADAPT) the section "Tools" Climate Resilient Low Carbon Factor Assessment Tool (CreLoCaF -** KLIMASKEN**) made**
Milestone foreseen: July 2019 Milestone completed: April 2021
Progress achieved: **completed.** Klimasken tool was applied in 3 Slovak and 4 Czech cities, where the follow up replication activities based on the Klimasken results have been realised (Annex C.1.4._9) The examples of cases of replication of the KLIMASKEN tool in Slovak Republic and Czech republic were presented during the Final conference (Annex C.1.4._8). In April 2021, information about the online tool was published on the Climate ADAPT/Research and knowledge projects website.
https://climate-adapt.eea.europa.eu/metadata/projects/developing-resilient-low-carbon-and-more-livable-urban-residential-area. Moreover, the Klimasken tool was quoted in the "EU-

level technical guidance on adapting buildings to climate change" among the identified building resilience rating approaches.
Problems, solutions, delays, and the impact on the other actions depended on this action: The activity was postponed due to postponement of the online tool preparation, as well as we would like to have the tools already tested in all of the selected pilots cities prior to publish about CreloCaF (Klimasken) on the European Climate Adaptation Platform Climate ADAPT. The tool will become autonomous. CI2 will provide the operation of the tool, IT maintenance and updates to the Klimasken web application and website independently of the DELIVER project after its completion. Based on the lessons learned from the climate labels produced, necessary adjustments will be proposed to further improve its functioning and faithfully capture climate resilience.

C.1.6. Benchmarking - comparison of indicators among selected cities
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.15 - Benchmarking results of the tier 6 pilot areas especially of other Covenant for Climate and Energy signatory cities in Slovakia and Czech Republic**
Deliverable foreseen: December 2019 Deliverable no. 15 completed: March 2021
Progress achieved: **completed.** Data intended for benchmarking were loaded into the tool. Each city / neighbourhood can create its own profile and compare results with others. (Annex C.1.6._1, Annex C.1.6._2). The comparison is programmed and available at https://www.klimasken.sk/cs/srovnani/14.
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay in this activity was influenced by a shift in the development of the online tool and more difficult negotiations with cities. They needed to get to know the principle of the instrument in more detail, and several meetings took place. Participating cities were burdened by addressing current issues related to the lockdown of its inhabitants and the coronavirus crisis and did not have the capacity to collect all data for the online tool, which led to a delay. It was also not possible to organise personal meetings in cities that are important for the given activity and collection of proper data.

C.2. Development, implementation and evaluation of Climate Resilient Low Carbon Action Plan (CReLoCa AP)
Foreseen start date: June 2018 Actual start date: June 2018
Foreseen end date: June 2023 Actual end date: December 2023
Beneficiary responsible for implementation: Mun-BA-KV

C.2.1. Establishment of the multi professional working group MUWOG
Status of the sub-action: completed
Deliverable/milestone: **milestone no.4 - Multi professional working group MUWOG** established
Milestone foreseen: October 2018 Milestone completed: October 2018
Progress achieved: **completed.** The MUWOG group was set up and the group's tasks were compiled in November 2018 (Annex C.2.1._1). It is being continually complemented according to the needs of the given expertise. First MUWOG meeting took place on November 29, 2018 (Annexes C.2.1._2 and C.2.1._3), the second one on March 5, 2019 (Annexes C.2.1._4 and C.2.1._5). Updated list of members of Multiprofessionnal Working Group (MUWOG) from 2023 is Annexes C.2.1._6.
Problems, solutions, delays, and the impact on the other actions depended on this action: The MUWOG working group has not met in 2020 due to the coronavirus crisis. Due to the

pandemic, in-person meetings were not possible, but the members of the group collaborated continuously online as needed. This mode of collaboration proved to be effective and therefore continued even after the end of the pandemic as the optimal model of collaboration based on ad hoc contacting of specific group members.

C.2.2. Vulnerability assessment of residential area of Karlova Ves Municipality visualized in a geographic information system (GIS) and narrative described

Status of the sub-action: completed

Deliverable/milestone: **deliverable no.4 - Residential area vulnerability assessment visualized in a geographic information system (GIS) and narrative described**

Deliverable foreseen: March 2019 Deliverable completed: January 2020

Progress achieved: **completed.** The vulnerability assessment was completed in January 2020 (Annex C.2.2._1). Background study of watercourses *Modelling and mapping of flood risk in the residential area Dlhe diely* elaborated by company DHI was handed over on March 15, 2019 (Annexes C.2.2._2 and C.2.2_3). The map of modelling and flood risk is published on map portal https://mapy-karlovaves.hub.arcgis.com/. SHMU has completed a study on climatological scenarios in February, 2019 (Annexes C.2.2._4 and C.2.2_5). The Study of the temperature modelling in relation to the urban heat island based in the urban structure of the Bratislava Karlova Ves Municipality (Annex C.2.2._6) was made in summer 2019 and was used as support material to create a vulnerability assessment.

Problems, solutions, delays, and the impact on the other actions depended on this action: The delay was caused by postponed necessary inputs (flood risk model by DHI and field temperature measurements in Karlova Ves) for the vulnerability assessment. This pilot assessment combining climatological data, flood modelling and field measurements analysed in GIS software was more technically challenging and time consuming than expected at the project beginning. During the process even more vulnerability factors (indicators) were analysed than originally intended. The vulnerability assessment is a part of Karlova Ves Climate Action Plan (CreLoCa AP).

C.2.3. Defining of the optimal innovative adaptation-mitigation solutions

Status of the sub-action: completed

Deliverable/milestone: **deliverable no.7 - Catalogue of possible adaptation and mitigation measures in different key sectors developed**

Deliverable foreseen: June 2019

Deliverable completed: October 2020

Progress achieved: **completed.** The final version of the catalogue was finalised in October 2020 (Annexes C.2.3._1 and C.2.3._2).

Problems, solutions, delays, and the impact on the other actions depended on this action: The work on the catalogue was subject to a joint consultation with MUWOG, similar to the preparation of the Climate Action Plan (CReLoCa AP). Due to the need to incorporate various analytical and evaluation materials and COVID-19 the finalisation progress was slowed down and postponed to October 2020. The catalogue was prepared in Slovak and English. For the target audience in the Czech Republic, to whom this project output is also available, the catalogue is in Slovak language. This solution was adopted because of the language connection between the two countries and the budget constraints for this activity. Therefore, it is an effective procedure based on the fact that in the Czech-Slovak region, due to the linguistic and cultural proximity of the two countries, publications, texts and spoken word in Slovak are also commonly disseminated in the Czech Republic and, conversely, Czech-language works often find their audience among the Slovak-speaking population in Slovakia. Thus, publications in Czech or Slovak are currently used throughout the whole area of the former Czechoslovakia,

without affecting their comprehensibility and usability for the inhabitants of these countries (Czechs and Slovaks).

C.2.4. Setting the mitigation goal and elaboration of Climate Resilient Low Carbon Action Plan (CReLoCa AP)
Status of the sub-action: completed
Deliverable/milestone: **milestone no.18 - Mitigation target, expressed in percentage of CO_2 emissions reduction by 2030 approved**
Deliverable/milestone: **deliverable no.13 - Climate Resilient Low Carbon Action Plan (CReLoCa AP) approved**
Milestone and deliverable foreseen: December 2019 Milestone no.18 and deliverable no.13 completed: June 2020
Deliverable/milestone: **deliverable no.25 - CReLoCa AP Evaluation Report**
Deliverable foreseen: December 2023
Deliverable/milestone: **deliverable no.26 - Proposal of new regulative for urban land-use planning**
Deliverable foreseen: May 2023 Deliverable no.25 completed: December 2023
Deliverable no.26 completed: May 2023
Progress achieved: **completed.** The Climate Resilient Low Carbon Action Plan was finalised in June 2020 (Annexes C.2.4._1 and C.2.4_2). It was approved during the MA meeting on 30 June 2020. Prior to the MA meeting, it was approved by the MC on 16 June 2020 (Annexes C.2.4._3). Mitigation target expressed in percentage of CO_2 emissions reduction by 2030 is part of the AP. Proposal of new standards and regulative for urban land-use planning was prepared in May 2023 (Annexe C.2.4._4). At the end of the project, an evaluation of the Climate Resilient Low Carbon Action Plan was carried out, primarily from the perspective of measures implemented within the project. This evaluation is not final and will serve as a basis for the preparation of the Climate Action Plan update (update 02/2024 - Annexe C.2.4._5).
Problems, solutions, delays, and the impact on the other actions depended on this action: First draft of CReLoCa AP was ready in December 2019 and presented during the public meeting with local inhabitants on 16th of December 2019. The topic was continuously incorporated into the work of the MAC in the autumn of 2019. The preparation of the AP, with the participation of the MUWOG members, consisted of the preparation of the vulnerability assessment, which was delayed due to the difficulty of obtaining data from various external sources. It was not possible to submit the final version to the MA held on 17 December 2019, because the final version would have to be completed already before 9 December 2019, when the MC met. The final working version was completed in February 2020 and ready for MA on 21 April 2020. But it was cancelled due to the outbreak of the new coronavirus.

C.3. Demonstration activities and implementation of concrete innovative measures on public buildings
Foreseen start date: January 2020 Actual start date: December 2020
Foreseen end date: December 2023 Actual end date: December 2023
Beneficiary responsible for implementation: Mun-Ba-KV

C.3.1. Realisation of deep renovation work on the demonstration building ZSAD
Status of the sub-action: **completed**
Deliverable/milestone: **milestone no.32 - Public building ZSAD partially refurbished (prototype solutions and insulation of walls)**
Milestone foreseen: October 2021 Milestone completed: September 2023

Progress achieved: **completed.** Reconstruction works started in December 2021 and final works ended in October 2023. More details about the activity can be found in Annex C.3.2._8.

Deliverable/milestone: **deliverable no. 31 - Photo documentation of the measures in primary school as part of the final report**
Deliverable completed: October 2023
Progress achieved: **completed.** Reconstruction works started in December 2021 and final works ended in October 2023. Photo documentation of the state before deep reconstruction and photos of the measures in primary school with a short description of all measures is available in Annex C.3.2._1.
Problems, solutions, delays, and the impact on the other actions depended on this action: The global crisis caused by the COVID19 pandemic has resulted in extreme market price increases, especially in the construction sector. It is a well-known fact that prices on the building materials market have risen at record levels and they were therefore incomparably higher than at the time of preparation, submission and approval of applications and subsequently at the signing of project contracts. Due to the high complexity of the deep renovation and limited financial resources, it was necessary to divide the work into several stages. The work was therefore carried out gradually, depending on the current state of the pooled resources. During the renovation, it was necessary to keep the school building accessible to children without disrupting the educational process. For this reason, it was necessary to set up a limited regime of renovation work, using times and periods when children were not present at school. For all of the above reasons, the renovation deadline was postponed, but despite all the difficulties, it was successfully completed during the project implementation period.

C.3.2. Realisation of deep renovation work on the demonstration building MSK

Status of the sub-action: completed
Deliverable/milestone: **milestone no.22 - Public buildings refurbished - kindergarten**
Milestone foreseen: June 2020 Milestone completed: April 2022
Deliverable/milestone: **deliverable no. 19 - Photo documentation of the measures in kindergarten as part of the progress report**
Deliverable foreseen: June 2021 Deliverable completed: April 2022
Progress achieved: **completed.** Reconstruction work started in December 2020 and final work was completed in April 2022. Photo documentation of the state before deep reconstruction and photos of the measures in kindergarten with a short description of all measures is available in Annex C.3.2._2. More details about the activity can be found in Annex C.3.2._9.

C.4. Residential buildings proposal for retrofit and quantification of energy potential savings for residential housing stock in Bratislava Karlova Ves Municipality

Foreseen start date: June 2018 Actual start date: September 2018
Foreseen end date: December 2019 Actual end date: January 2020
Beneficiary responsible for implementation: IEPD

C.4.1. Energy consumption evaluation for buildings operation for existing building stock of Municipality Karlova Ves

Status of the sub-action: completed
Deliverable/milestone: **milestone no.5, deliverable no.2 - Report on existing building stock of Municipality Karlova Ves data collecting and analysing created**
Milestone foreseen: December 2018 Milestone completed: February 2019

Progress achieved: **completed.** Report on existing building stock of Municipality Karlova Ves data collecting and analysing was created (Annex C.4.1._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay was partially caused by a complicated review of the existing old documentation of the building stock, which was based on cooperation with the building office of Mun_BA-KV. We have checked blue prints available in archives, which were prepared stepwise.

C.4.2. Energy optimisation, solutions proposal for two residential building to reach the "near zero energy building" standard
Status of the sub-action: completed
Deliverable/milestone: **milestone no.14 - Calculations of energy and CO_2 - PHPP calculations potential analyses of both buildings**
Milestone foreseen: October 2019 Milestone completed: January 2020
Deliverable/milestone: **deliverable no.6 - Architectural studies of 2 buildings developed**
Deliverable foreseen: June 2019 Deliverable completed: January 2020
Progress achieved: **milestone completed.** Calculations of energy and CO2 - PHPP calculations potential analyses of both buildings (Annex C.4.2._1). **deliverable completed** Architectural study - apartment building Karloveska 57 (Annex C.4.2._2 and C.4.2._3) **.** More details about the activity can be found in Annex C.4.2._13.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

C.4.3. Quantification of energy potential savings for the residential housing stock in Bratislava Karlova Ves Municipality
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.14 - Quantification of energy potential savings for the residential housing stock in Bratislava Karlova Ves Municipality** made
Deliverable foreseen: December 2019 Deliverable completed: January 2020
Progress achieved: **completed** (Annexes C.4.3._1 and C.4.3._2). Quantification of energy savings potential was prepared based on assessment of condition of prefabricated residential buildings according to planned activities and consecutive working steps. Three activities have been realised before the relevant data processing and quantification which offered necessary inputs and information regarding the condition of refurbishment of prefabricated residential buildings (1st activity C4: Report from survey on the condition of prefabricated residential buildings in Municipality of Bratislava - Karlova Ves), the processing of energy optimisation of selected two prefabricated residential buildings - refurbished and non-refurbished (2^{nd} activity C4: PHPP energy optimisation for two prefabricated residential buildings - refurbished, non-refurbished), and for the selected two prefabricated residential buildings, the processing of architectural studies concerning refurbishment (3^{rd} activity C4: Architectural studies of two prefabricated residential buildings-refurbished and non-refurbished). We prepared a table, which shows an inventory of streets, floor area of all entrances and calculated potential of CO_2 emission savings.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

C.5. Demonstration activities and implementation of concrete innovative measures on open public space with public participation method

Foreseen start date: March 2019 Actual start date: March 2021 (Kaskády park)
Foreseen end date: September 2020 Actual end date: November 2021 (Kaskády park)
Beneficiary responsible for implementation: Mun-BA-KV/BROZ on the biodiversity issues

C.5.1. Realisation of mitigation and adaptation measures with regards on biodiversity
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.18 - Demonstration open space reconstructed**
Deliverable foreseen: March 2020
Deliverable completed: November 2021 (Kaskády park – alternative open space)
Deliverable/milestone: **milestone no.27 - Post evaluation' study report**
Milestone foreseen: November 2020
Milestone completed: July 2022 (Kaskády park)
Progress achieved: **completed.** More details about the activity can be found in Annex C.5.1._5.

C.6. Implementation of demonstration adaptation measures on public buildings and public spaces for enhancement of biodiversity resilience within the cities
Foreseen start date: January 2019 Actual start date: July 2018
Foreseen end date: June 2023 Actual end date: December 2023
Beneficiary responsible for implementation: BROZ

Deliverable/milestone: **milestone no.19 -Places for first biodiversity measures selected**
Milestone foreseen: January 2020 Milestone completed: January 2020
Progress achieved: **completed.** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone: **milestone no.25 - 3 insect hotels created**
Milestone foreseen: October 2020 Milestone completed: April 2021
Progress achieved: **completed** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone: **milestone no. 29 - Half of the habitats for hedgehogs and reptiles created**
Milestone foreseen: December 2020 Milestone completed: November 2019
Progress achieved: **completed**. More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone: **milestone no.30 - 15 nesting /feeding boxes for birds installed**
Milestone foreseen: February 2021 Milestone completed: March 2021
Progress achieved: **completed**. More details about the activity can be found in Annex C.6._16.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A.

Deliverable/milestone: **milestone no.34 - Half of the flowering grasslands and flower beds created**
Milestone foreseen: October 2021 Milestone completed: November 2020
Progress achieved: **completed.** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone: **milestone no.36 - 5 drinking places for animals realized**
Milestone foreseen: December 2021 Milestone completed: October 2020
Progress achieved: **completed.** More details about the activity can be found in Annex C.6._16.
Problems, solutions, delays, and the impact on the other actions depended on this action: No problems. The arbour will be constructed during June – July 2020 together with drinking places.

Deliverable/milestone: **milestone no.37 - Half of the trees and bushes planted**
Milestone foreseen: December 2021 Milestone completed: November 2021
Progress achieved: **completed.** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone: **milestone no.38 - Planting of native trees and bushes demonstrated on 3 areas**
Milestone foreseen: December 2021 Milestone completed: May 2019
Progress achieved: **completed.** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone **milestone no. 35 - Half of impermeable concrete areas changed to permeable (spolu má byť 100 m^2)**
Milestone foreseen: November 2021 Milestone completed: November 2023
Progress achieved: **completed.** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone **milestone no. 39 - Creation of half of area of climate ponds (25 m^2)**
Milestone foreseen: March 2022 Milestone completed: November 2021
Progress achieved: **completed.** More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone **milestone no. 40 - 4 apiaries installed**
Milestone foreseen: April 2022 Milestone completed: May 2022
Progress achieved: **completed**. More details about the activity and problems, solutions, delays, and the impact on the other actions depended on this action can be found in Annex C.6._16.

Deliverable/milestone **milestone no. 41 - The demonstration green vertical wall installed**
Milestone foreseen: May 2022 Milestone completed: May 2022
Progress achieved: **completed.** More details about the activity can be found and problems, solutions, delays, and the impact on the other actions depended on this action in Annex C.6._16.

C.7. Low-carbon resilient community building through the creation of COmmunity Climate and Biodiversity Educational Centre (CoCliBEC)

Foreseen start date: July 2019 Actual start date: January 2019
Foreseen end date: June 2023 Actual end date: Dec 2023
Beneficiary responsible for implementation: Mun-BA-KV in coop. with CDI, CI2 and BROZ

C.7.1. Design of the educational and demonstration zones (EDZ)

Status of the sub-action: completed
Deliverable/milestone: **milestone no.17 - Design of the educational and demonstration zones developed**
Milestone foreseen: December 2019 Milestone completed: December 2019
Progress achieved: **completed.** The reconstruction of the indoor room for educational and community activities is part of the ZSAD project documentation /blue print. (Annex C.7.1._1 - C.7.._5), The special section on web page was created (Annex C.7.1._6). Leaflet for educational trail was printed in Slovak and English (Annex C.7.1._7, C.7.1._8).
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

C.7.2. Building-up public counselling center

Status of the sub-action: completed
Deliverable/milestone: **milestone no.20 - Counselling team created**
Milestone foreseen: June 2020 Milestone completed: March 2021
Progress achieved: **completed.** We organised 42 counselling events with 266 participants in total (Annex C.7.2._1.). 2509 participants participated in workshops, lectures and presentations in total ((Annex C.7.2._2). More details about the activity can be found and problems, solutions, delays, and the impact on the other actions depended on this action in Annex C.7.2._16.

C.7.3. Preparation and printing brochure for EDZ (Educational and demonstration zones) visitors

Status of the action: completed
Foreseen start date: January 2021 Actual start date: March 2021
Foreseen end date: September 2021 Actual end date: September 2023
Progress achieved: **completed.** The final version of the brochure was completed and printed out in September 2023 (Annex C.7.3._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: The printing of the brochure was delayed due to the postponement of the renovation date of the school's atriums, where the models were to be placed.

C.7.4. Design, production and installation of parts of the outdoor zone/exhibition

Status of the sub-action: completed
Foreseen start date: January 2021 Actual start date: December 2019
Foreseen end date: October 2021 Actual end date: July 2022
Progress achieved: **completed**
In December 2019, a meeting related to models took place (Annex C.7.4._1), on the base of which they were designed (Annex C.7.4._2). The placement of models was included as part of the project documentation for the deep renovation of the ZSAD. The winner of the public procurement handed over nine 2D and 3D interactive models on June 15, 2022 (Annex C.7.4._3) with six information panels. On July 27, 2022, the models were installed and tested. (Annex C.7.4._4 and C.7.4._5).
Problems, solutions, delays, and the impact on the other actions depended on this action: In June 2021, six entities were invited to submit a tender. Only Jan Baláček submitted an offer in tender, and a Contract for Work was signed with him on September 2, 2022. According to this contract, the models were to be manufactured by May 31, 2022, and their assembly and installation by July 15, 2022 at the latest. For the reason of the final renovation work and gardening work in the atriums, the models were put into storage to avoid damage and to be used again in spring 2023.

C.7.5. Educational trail around all realised project installations

Status of the sub-action: completed
Deliverable/milestone: **milestone no.26 - First boards of educational trail installed**
Milestone foreseen: November 2020 Milestone completed: June 2020
Progress achieved: **completed**
In June 2020, first 6 wooden boards were installed: 1 was installed in MSK and 5 boards in recreational and sports area Majernikova (Annex C.7.5._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

Deliverable/milestone**: milestone no.42 - Full educational trail created**
Milestone foreseen: December 2022 Milestone completed: May 2021

Progress achieved: **completed.** Education trail was completed in 05/2921 (text panels were printed 05/2021). We have 10 informational and educational text panels (9 in the area at ZSAD and 1 in MSK) on 6 wooden stands (5 in the area at ZSAD and 1 MSK). (Annex C.7.5._2 and Annex C.7.5_2a)
Problems, solutions, delays, and the impact on the other actions depended on this action: The only problem is the scribbled boards. They were cleaned with various chemical preparations.

Deliverable/milestone: **deliverable no. 20 - CoCliBEC opened (outdoor and indoor)**
Deliverable foreseen: September 2021 Deliverable completed September 2022
Progress achieved: **completed.** On October 3, 2022, we opened the Community Education Center for Climate and Biodiversity (KVC); presentation room. The opening ceremony of the KVC was attended by 22 people (Annexes C.7.5._4, C.7.5._5, C.7.5._6, C.7.5._7). The ceremony took place in the newly created KVC presentation room, which was created by rebuilding part of the heat exchange station in the building of ZSAD and has a separate entrance from Ľ. Fullu Street. We have prepared an information leaflet about the KVC (Annexe C.7.5._3,) and the KVC Operating Rules. The Operating Regulations for KVC (Annex C.7.1._2) are a set of rules and guidelines that govern the operation of The KVC. They are designed to ensure the safety, security, and efficiency of the facility, as well as the well-being of its users. Since opening the KVC a hotline was created - people interested in organising an activity in the KVC can contact us at the e-mail address: spravca-KVC@karlovaves.sk or by calling the telephone number: 02/707 11 143, 02/707 11 144. Information about the services proposed by KVC is published on the official main website of Bratislava-Karlova Ves Municipality (https://www.karlovaves.sk/zivotne-prostredie-a-projekty/komunitne-centrum-pre-klimu-a-biodiverzitu/) and on the outdoor information board in front of the main entrance of the KVC (Annex C.7.1._5).
Problems, solutions, delays, and the impact on the other actions depended on this action: The activity was delayed due to the postponed completion date of the building's renovation.

Deliverable/milestone: **deliverable no. 24 - Leaflet to educational trail produced**
Deliverable foreseen: January 2023 Deliverable completed: September 2023
Progress achieved: **completed** (Annex C.7.1._7 and Annex C.7.1_8). The leaflets were printed in two language versions, Slovak and English. They are a guide along the educational trail in the ZSAD campus. A map with photos of all measures to support and increase biodiversity and their GPS coordinates is included.
Problems, solutions, delays, and the impact on the other actions depended on this action: The first drafts of the leaflet were created at the beginning of 2023, but the constant revision, additions and improvements took more time, so the activity was delayed and they were produced in 10/2023.

C.7.6. Hire and train staff of the EDZ (educational and demonstrational zone)
Status of the sub-action: completed
Foreseen start date: January 2021 Actual start date: September 2021
Foreseen end date: September 2021 Actual end date: December 2023 (continuation after the end of the project)
Progress achieved: **completed.** Since September 2021, a system of cooperation has been established between project partners BROZ and Bratislava-Karlova Ves Municipality (BA-KV) regarding the maintenance of the sports and recreation area Majerníkova 60-62, which houses the educational and demonstration zones of the KVC. BROZ focused on building and maintaining measures to support biodiversity, and an employee of BA-KV started working as the Technical Administrator of the sports and recreation area at Majerníkova 60-62. This

position of Technical Administrator also includes the administration of the KVC, which means maintaining order and good technical condition of the equipment in the lecture room as well as the good technical condition of the interactive models in the atriums. Furthermore, the position of Organisational Administrator was created, who is responsible for organising educational events at the KVC. These positions remain valid and active even after the end of the project (Annex C.7.6._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay in this activity was caused by the delay of partial sub activities of activity C.3. The deep renovation of the ZSAD was completed in October 2023, but the activities for KVC started earlier and were adapted to the current renovation conditions.

C.8. Enabling environment in the Slovak national legal and regulatory framework towards supporting climate resilient measures in construction, retrofitting of buildings and its surroundings

Foreseen start date: October 2020 Actual start date: January 2019
Foreseen end date: October 2022 Actual end date: December 2022
Beneficiary responsible for implementation: CDI

C.8.1. Digest of existing DELIVER project pertinent legal and regulatory acts

Status of the sub-action: completed
Deliverable/milestone: **milestone no.31 - Review the current Slovak legislative and regulatory framework**
Milestone foreseen: March 2021 Milestone completed: April 2021
Progress achieved: **completed.** Activity started earlier than planned, the reason was the coincidence with work on the amendments of 2 principal Acts - Act on Nature and Landscape protection and Building Act led by national authorities. Our comments to the possible amendments and the proposal of standards were based on an analysis of the current national legislative and regulatory framework to support the implementation of adaptation measures in cities. Due to problems in gaining data on electricity consumption the official letter to the Ministry of Economy was submitted. Regarding the communication and lobbying at responsible line ministries and legislative bodies and in addition to written proposals, the series of steps (meetings, seminars, and roundtables) has been organised to push the proposal among representatives of legislative and administration bodies. Comments under the regular commenting procedure to the act No. 543/2002 Coll. on Nature and Landscape Protection were prepared and submitted to the MoE SR (Annex C.8.1._1). Comments acquired the support of 900 supporters. There was a contradictory procedure with the submitter of the law, the Ministry as the petitioner and representatives of CDI and Mun_BA-KV. Comments were made on part of the wording of the Building Act (Annex C.8.1._2)in cooperation with The Union of Towns and Cities of Slovakia, on the Spatial Planning Act (Annex C.8.1._3) and on the Construction Law (Annex C.8.1._4) in cooperation with Mun_BA-KV, IEPD and BROZ. The processed comments were presented in various forums also through the members of the working group related to the amendment of the Building Act. The proposals and comments to the amendment of the Building Act were officially sent to the State Secretary of the Ministry of the Environment of the Slovak Republic, Mr. Kurilla on 29th of January 2019 (Annex C.8.1._5).The first version of the Review the current Slovak legislative and regulatory framework was completed in April 2021 and then updated in December 2022 (Annex C.8.1._6).
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

C.8.2. Analysis of the DELIVER project content related acts and regulations

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.21 - Analysis based on legal and regulatory national framework, experiences from pilot demonstration measures preparation and implementation in BA-KV**
Deliverable foreseen: May 2022 Deliverable completed: June 2022
Progress achieved: **completed.** The first version of the Analysis based on legal and regulatory national framework experiences from pilot demonstration measures preparation and implementation was completed in June 2022 and then updated in December 2022 (Annex C.8.2._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: Activity partly started earlier than planned, because of a novelisation process of Act on Nature and Landscape protection and Building Act led by national authorities. Because of the enormous number of comments in the Building Act novelisation process, the process was paused and will be prolonged indefinitely. However, after the national elections in February 2020, the newly formed government put under their priorities to amend the Building Act in 2020.

C.8.3. Looking for inspiration in more advanced EU countries in this field
Status of the sub-action: completed
Foreseen start date: January 2020 Actual start date: September 2019
Foreseen end date: May 2022 Actual end date: May 2022
Progress achieved: **completed.** The work regarding finding inspiration in more advanced EU countries in the field of SUDS has been undertaken. The output "Looking for inspiration in more advanced EU countries in the field of the sustainable rainwater management (and comparison to Slovakia)" was created (Annex C.8.3._1)
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

C.8.4. Proposition of changes, including detailed elaboration of eventual changes or amendments of relevant acts
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.23** Deliverable foreseen: June 2022
Deliverable completed: June 2022
Progress achieved: **completed.** Continuous communication and lobbying was carried out at relevant line ministries and legislative bodies. More details about the activity can be found in Annex C.8.4._6.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

C.8.5. Communication and lobbying at responsible line ministries and legislative bodies
Status of the sub-action: completed
Foreseen start date: October 2020 Actual start date: January 2019
Foreseen end date: October 2022 Actual end date: December 2022
Progress achieved: **completed.** Continuous communication and lobbying was carried out at relevant line ministries and legislative bodies. More details about the activity can be found in Annex C.8.5._9.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

D.1. Monitoring of the effectiveness of project adaptation and mitigation actions and impact of the project actions on biodiversity within the residential area of Karlova Ves
Foreseen start date: July 2018 Actual start date: September 2018
Foreseen end date: Dec 2023 Actual end date: December 2023

Beneficiary responsible for implementation: Mun_BA-KV / BROZ
Status of the action: completed
Deliverable/milestone: **milestone no.15 - Indicator´s part of the Progress Monitoring Report**
Milestone foreseen: December 2019 Milestone completed: December 2019
Progress achieved: **completed**. Key Project Indicators were added to the Online KPI tool and approved before submitting the Progress Report no.1 in December 2019.
Problems, solutions, delays, and the impact on the other actions depended on this action: After some technical problems with access to KPI online tool, we succeeded finally to fill them online thanks to consultations with the monitor and to send them for verification.

Deliverable/milestone: **milestone no.23 - Questionnaire for local inhabitants' evaluation**
Milestone foreseen: June 2020
Milestone completed: November 2020
Progress achieved: **completed**. Questionnaire is part of the second survey (subactivity D.2.3.).
Problems, solutions, delays, and the impact on the other actions depended on this action: Delay in this activity is resulting from the COVID-19 pandemic situation.

Deliverable/milestone: **deliverable no.12 - Initial monitoring report**
Deliverable foreseen: November 2019 Deliverable completed: December 2019
Progress achieved: **completed.** Preliminary botanical monitoring of composition of herbs and trees was done in both locations - ZSAD and MSK in the year 2018 and 2019 (Annex D.1._1). Since it was done from the end of August till October 2018, the full composition could not be described and botanical monitoring was repeated in the spring - early summer 2019. Report was produced in January 2020. (Annexes D.1._2 a D.1._3). Preliminary entomological monitoring was done also during August - October 2018 (Annex D.1._4). The grasslands in both areas were cut during the monitoring so the full composition of the butterflies and other important pollinating species could not be fully described. Therefore, the repeated monitoring was conducted from April 2019 till October 2019. During monitoring of the insects, a very rare species of fly *Leopoldius valvatus* was recorded for the first time in Slovakia ever in MSK (Annex D.1._5). Report is in Annex D.1._6, summary in English (Annex D.1._7). The success of measures – uncut grasslands and creation of insect hotels was proved by recent findings during entomological monitoring. The monitoring of occurrence of lizards (Lacerta viridis, Anguis fragilis), snakes, frogs, hedgehogs, and other animals, which use to occur in these areas under favourable conditions was done from August till December 2019. The report includes data also from previous historical observations from the 1990s (Annexes D.1._8 and D.1._9). The creation of hiding places for hedgehogs and lizards were proved to be useful. In May 2020 in ZSAD and MSK the individuals of hedgehogs were observed close to the created hiding places. (Annex D.1._10). During the WS for children on June 23, 2020 where children removed the stones from the original hiding place for reptiles to another place (due to planned construction of arbour) 4 individuals of *Anguis fragilis* were captured in the old hiding place and released to a newly created hiding place. One individual cadaver of Anguis fragilis was found in the other area within ZSAD. Moreover, many different species of insect were found hiding in the rocks (Annex D.1._10). In MSK in April 2 individuals of *Lacerta viridis* were observed during the fencing of uncut grassland area.
Problems, solutions, delays, and the impact on the other actions depended on this action: Botanical and entomological monitoring was carried out annually. The longer these monitorings take place, the more informative the results are. Especially for insects. The reports from the monitoring were submitted annually in 2019 (Annex D.1._2 and Annex D.1._6), 2020 (Annex D.1._13 and Annex D.1._14), 2021 (Annex D.1._15 and Annex D.1._16) and the final

reports from monitoring in 2022 (Annex D.1._17 and Annex D.1._18). An information and a recommendations from the monitoring reports played a very important role in the planning and implementation of the measures to support the biodiversity. At the same time, they were an asset in assessing the impact of measures on biodiversity. Thanks to botanical monitoring, we know that we have increased the number of flowering plants in the lawns by limited and mosaic mowing. In one lawn in ZSAD, even from 15 species in 2018 to an incredible 77 species in 2022. It is also possible without planting, it is necessary just to give the plants space in the form of a limited mowing regime and let them grow. Entomological monitoring pointed out that the insect community at the project sites includes several species of interest for nature conservation and faunistics. Many of the species recorded are saproxylic, predatory or parasitoid, suggesting that the urban environment provides an abundance of niches for insects. In 2019, was found a new species of thick-headed fly for Slovakia in the project locality MŠ Kolískova, in 2020 was recorded other new species a rare saproxylic hoverfly *Spilomyia saltuum* (Diptera: Syrphidae), was found interesting robber flies (Diptera: Asilidae), such as the tiny psammophilous *Stichopogon elegantulus* or the thermophilous *Holopogon fumipennis*.The basic limiting factor in the occurrence of animals is the food and shelter options offered by the environment. The creation of suitable biotopes with shelters for rest and safe reproduction, as well as the expansion of the food base, is a prerequisite for successful settlement even of protected animals in an urban environment. Another important attribute is the minimization of danger, barriers, and possible predation.

Deliverable/milestone: **milestone no.44 - Indicator´s part of the Final Monitoring Report**
Milestone foreseen: June 2023 Milestone completed: February 2024
Progress achieved: **completed.** The end values KPI and values beyond 5 years were sent for verification on 16.02.2024 already before sending the Final Report.
Problems, solutions, delays, and the impact on the other actions depended on this action: After online consultation with the KPI expert we succeeded to optimise the setting of the Overarching contexts (OC), Specific contexts (SCs) and Project Specific Settings and Indicator Selection, so that they are more suitable and representative for our project.

Deliverable/milestone: **deliverable no.27 - Final monitoring report**
Deliverable foreseen: June 2023 Deliverable completed: December 2023
Progress achieved: **completed.** Final monitoring report was carried out in the period from 4/2023 to 9/2023 and the report was submitted 12/2023 (Annex D.1._11). The targeted species include the pale and/or European hedgehog (*Erinaceus sp.*), the blind breaking snake (*Anguis fragilis*), the wall lizard (*Lacerta muralis*), the green lizard (*Lacerta viridis*), the tree snake (*Zamenis longissimus*), the smooth snake (*Coronella austriaca*) and green toad (*Bufo viridis*).
Problems, solutions, delays, and the impact on the other actions depended on this action, plan to catch up: Two monitoring reports were originally planned - one at the beginning of the project - before the measure's implementation and one at the end of project - after all measures will be realized. However botanical and entomological monitoring was carried out annually based on the recommendation of experts. The longer these monitorings take place, the more informative the results are. Especially for insects. Reports from monitoring were submitted annually. Animal monitoring was provided by the BROZ project team during activities in the field, in addition to the expert biologist. The results of the monitoring point to an increase in the attractiveness of the locations of interest, especially the grounds of ZSAD and MSK, where several measures were implemented to increase biodiversity for the occurrence of the mentioned species. This aspect greatly reduces the use of these shelters by reptiles. The shelters for hedgehogs and reptiles were already used by hedgehogs, blind, green lizards, tree snakes and smooth snakes in the first year. The problem in the area at ZSAD is persistent vandalism,

which negatively affects the function of the measures, especially the destruction of hiding places made of stones. The wall lizard was found only in Karloveská lodenica. The green toad was not recorded during monitoring on the monitored areas.

Deliverable/milestone: **deliverable no.32 - Report about the climate conditions (temperature, humidity) before and after realisation of measures**
Deliverable foreseen: June 2023 Deliverable completed: December 2023
Progress achieved: **completed.** The regulating ecosystem services includes especially the micro-climate regulation. Planted trees, shrubs, climbing plants, created water and wetlands surfaces, green roofs and the near nature green spaces management are influencing both the water cycle via transpiration, and local heating and cooling via solar radiation absorption. For example, vegetation absorbs more heat than bare soil due to their respective albedos and the heat is reduced actively through the process of photosynthesis. Lastly, especially trees keep the local areas cool by providing shade and releasing water vapour into the atmosphere. A significant impact was also shown as well as in the case of urban meadows in combination with the woody vegetation, cooler by more than 15 °C compared to regularly mowed grassy areas which are without vegetation. The significant influence of the water small elements (ponds) to improve the local microclimate is widely acknowledged and was verified in the atrium of Kindergarten Koliskova and Kaskady public open space. For example, the impact of the created water ponds to improve the local microclimate was measured in Kaskady, where the area is cooler by approximately 1 °C in the morning and afternoon (Annex D.1._12). Monitoring was carried out in the area of A. Dubček Primary School at approximately 14-day intervals, depending on weather and personnel availability, from May to September in the years 2019 to 2023. A total of 19 different surfaces were monitored at 15 locations in the area.
Problems, solutions, delays, and the impact on the other actions depended on this action: Forest and shade have a significant effect on lowering the temperature. The results show that vegetation is necessary for building climate-resistant settlements. It is important to plant trees as much as possible, establish vegetated roofs and eliminate asphalt and concrete surfaces. (Annex D.1._12)

D.2. Monitoring of socio-economic impact of the project

Foreseen start date: July 2018 Actual start date: July 2018
Foreseen end date: Dec 2023 Actual end date: Dec 2023
Beneficiary responsible for implementation: Mun_BA-KV

Deliverable/milestone: **milestone no.1 - First monitoring report**
Milestone foreseen: July 2018 Milestone completed: November 2018
Progress achieved: **completed.** The first questionnaire survey was carried out in September - November 2018 - Satisfaction of inhabitants with living in the residential area Dlhe diely - perception of the climate change impacts. The survey was joined by 359 persons. The first monitoring report - Satisfaction of inhabitants with living in the residential area Dlhe diely was completed (Annexes D.2._1 and D.2._2). The first report from the survey of non-material benefits of the project was completed as well (Annex D.2._3). The second questionnaire survey was carried out in August – September 2020 - to evaluate the knowledge about adaptation measures implemented in the frame of the project. The survey was joined by 327 persons. The second monitoring report - Satisfaction of inhabitants with living in the residential area Dlhe diely was completed (Annexes D.2._4 and D.2._5). The second report from the survey of non-material benefits of the project was completed as well (Annex D.2._6).
The third questionnaire survey was carried out August – September 2023 - in addition to the report on the state of public opinion and awareness in 2023, it compares current results with

those found in questionnaire surveys in 2020 and 2018. The survey was joined by 593 persons. The final monitoring report - Satisfaction of inhabitants with living in the residential area Dlhe diely was completed including the final report from the survey of non-material benefits as well (Annex D.2._7).
Problems, solutions, delays, and the impact on the other actions depended on this action: The selection procedure for the processor took place in the summer months and a the first questionnaire survey was done after the holiday period until November 2019.

Deliverable/milestone: **milestone no.16 - indicator´s part of the Progress Monitoring Report**
Milestone foreseen: December 2019 Milestone completed: December 2019
Progress achieved: **completed.** Key Project Indicators were added to the Online KPI tool and approved before submitting the Progress Report no.1 in December 2019. Problems, solutions, delays, and the impact on the other actions depended on this action: After some technical problems with access to KPI online tool, we succeeded finally to fill them online thanks to consultations with the KPI expert and to send them for verification.

Deliverable/milestone: **milestone no.24 - Second monitoring report**
Milestone foreseen: June 2020 Milestone completed: November 2020
Progress achieved: **completed.** The second monitoring report - Residential area Dlhe diely and climate change - what has changed after two years was completed in November 2020 (Annexes D.2._4 and D.2._5). The second report from the survey of non-material benefits of the project was completed as well (Annex D.2._6).
Problems, solutions, delays, and the impact on the other actions depended on this action: In-person inquiries were limited in 2020 due to the COVID-19 pandemic and therefore did not take place.

Deliverable/milestone: **milestone no.45 - Indicator´s part of the Final Monitoring Report**
Milestone foreseen: Dec 2023 Milestone completed: February 2024
Progress achieved: **completed.** The end values KPI and values beyond 5 years were sent for verification on 16.02.2024 already before sending the Final Report.
Problems, solutions, delays, and the impact on the other actions depended on this action: After online consultation with the KPI expert we succeeded to optimise the setting of the Overarching contexts (OC), Specific contexts (SCs) and Project Specific Settings and Indicator Selection, so that they are more suitable and representative for our project.

Deliverable/milestone: **deliverable no.28 - Final monitoring report**
Deliverable foreseen: December 2023 Milestone completed: September 2023
Progress achieved: **completed.** The final monitoring report - Residents' satisfaction with the quality of life in the Dlhé diely housing estate Climate change, nature-based solutions, support of biodiversity, social and community life - Report on the evaluation of the questionnaire survey and the Report from the final survey of non-materials benefits of the project was prepared. (Annex D.2._7).
Problems, solutions, delays, and the impact on the other actions depended on this action: In the view of the approved extension of the project, the deadline of the deliverables was postponed. We wanted to keep the same period for the survey for the next parts of monitoring, therefore the survey was done after the holiday and the report soon after evaluation of the survey.

E.1. Communication and dissemination of results to the general public in local, national and international media (workshops, conferences, seminars, study tours, guidebooks etc.). Dissemination of results to decision makers.

Foreseen start date: June 2018 Actual start date: June 2018
Foreseen end date: December 2023 Actual end date: December 2023
Beneficiary responsible for implementation: CDI

E.1.1. Project LIFE DELIVER website

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.1 - Project website created**
Deliverable foreseen: October 2018 Deliverable completed: October 2018
Progress achieved: **completed.** The project website www.odolnesidliska.sk works in bilingual versions, Slovak and English (09/2018).(Annex E.1.1._1). Numbers of unique visits set up at the beginning were estimated based on our experiences with similar project websites. The real users and unique visits were higher than was estimated. The statistics from the tool Google Analytics for each year are available in the (Annexes E.1.1._2a, 2b).The total number of sessions is 13 091 (end of project activities 12/2023). The webpage is updated regularly. In the English version visitors can find the main information about the project and main outputs and deliverables. The project partners agreed to monitor the website on an ongoing basis by the project partners and share information, in particular from the part News, via their websites and social media, as well as on sending of suggestions, comments and article tips.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.1.2. Notice boards

Status of the sub-action: **completed**
Foreseen start date: January 2019 Anticipated start date: July 2021
Foreseen end date: October 2021 Actual end date: December 2023
Progress achieved: **completed.** 4 notice boards were created. After the renovation of the Kindergarten MSK building completed in April 2022, we installed an information board in front of the kindergarten with information about the adaptation and mitigation measures and measures to support biodiversity implemented during the deep green renovation of the building and the sources of its financing (Annexes E.1.2._1 and E.1.2._2). After the renovation of the Primary School ZSAD building completed in October 2023, we installed an information board in front of the school with information about the adaptation and mitigation measures and measures to support biodiversity implemented during the deep green renovation of the building and the sources of its financing (Annex E.1.2._3 and Annex E.1.2_4). Another openable outdoor information board in front of the main entrance of the Community Education Centre for Climate and Biodiversity (KVC) was installed in the purpose of informing about current or up- coming events in KVC (Annex C.7.1._5). After renovation of the alternative public open space Kaskády, we installed an information board about implemented water retention measures and financial support from all donors (Annexes E.1.2._5 and E.1.2._6).
Problems, solutions, delays, and the impact on the other actions depended on this action: In the project proposal, two boards describing LIFE-DELVER project (one on the Mun-BA-KV building, another on the ZSAD - CoCliBEC) were planned. During the project implementation, we found out that it will be more reasonable to place them on the refurbished buildings of MSK and ZSAD that will happen when the both buildings are renovated. The reason is that information on the project is already displayed to the public on the poster placed at the entrance of the Mun_Ba-KV building and on roll-up that is displaced in the project staff office.

E.1.3. Layman's report

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.30 - Layman's report**
Deliverable foreseen: Dec 2023 Deliverable completed: November 2023
Progress achieved: **completed.** The report was published in November 2023. The report summarises all important project outputs in an accessible form for the public (Annexes E.1.3._1a, E.1.3._1b)
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.1.4. Project LIFE DELIVER kick off conference
Status of the sub-action: completed
Deliverable/milestone: **milestone no.2 - kick off conference organised**
Milestone foreseen: October 2018 Milestone completed: October 2018
Progress achieved: **completed.** The Kick off conference of the project was held on 12 September 2018 from 8:30 am to 3:10 pm at the University Library in Bratislava. 97 participants were welcomed by Mrs. Dana Cahojova, Mayor of the Municipality Bratislava-Karlova Ves; Mr. Jozef Skultety, Director of Climate Change Policy Department, Ministry of Environment of the Slovak Republic; and by Mr. Milan Galanda, Secretary General of the Union of Towns and Cities of Slovakia. The participants listened to 10 expert lectures focused on climate change and residential area, increasing resilience to climate change impacts, reducing CO_2 emissions in a residential environment, in-depth refurbishment of buildings, adaptation to climate change, vulnerability assessment, nature-based solutions, promotion of biodiversity in residential environments. These topics were then discussed with the lecturers. The conference was organized in partnership with the Union of Towns and Cities of Slovakia, the University Library in Bratislava and in cooperation with the company *Prva stavebna spolocnost* (Annexes E.1.4._1 - E.1.4._14).
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.1.5. Local events
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: May 2018
Foreseen end date: June 2023 Actual end date: December 2023
Progress achieved: **completed.** Communication about the project took place at the following public events organised by the Mun-BA-KV annually: Karloveský majáles: 19 May 2018 and 18 May 2019; Karloveské hody: 28-30 September 2018 and 27-29 2019 (Annex E.1.5._1).
Problems, solutions, delays, and the impact on the other actions depended on this action, plan to catch up: Karloveský majáles and Karloveské hody were not organised in 2020 and 2021 due to the coronavirus crisis. The global economic crisis led to necessary cuts in costs for organising cultural events in the BA-KV Mun. Project promotion and public information were provided in other ways from 2020 to 2023.

E.1.6. Professional seminars
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: October 2019
Foreseen end date: June 2023 Actual end date: November 2023
Progress achieved: **completed**
We organised and/or participated in 6 professional seminars. List of all Professional seminars can be found in Annexes E.1.6._19. More details about the activity can be found in Annex E.1.6._20.
Problems, solutions, delays, and the impact on the other actions depended on this action: The March 2020 conference (3rd seminar) XVI. Meeting of the National Platform of the Covenant

of Mayors for Climate and Energy. The replacement date in September was also cancelled due to the new coronavirus crisis.

E.1.7. Project final conference

Status of the action: completed

Foreseen start date: January 2023 Actual start date: October 2023

Foreseen end date: May 2023 Actual end date: October 2023

Progress achieved: **completed.** On October 26, 2023, the Closing Conference of the DELIVER project took place at the Water Museum in Bratislava. The conference titled "Resilient Housing Estates for the Future - A New Approach to Building Climate-Proof Cities" was organized by the Bratislava-Karlova Ves City District in partnership with the Union of Towns and Municipalities of Slovakia and the DELIVER project partners: Bratislava Regional Protection Association, Ci2, Passive House Institute and CDI. The conference was intended for representatives of local and municipal governments, state administration, academia and the professional public, and was attended by more than 40 participants. The attached files contain the invitation with the program (Annex E.1.7._1), the attendance list (Annex E.1.7._2) and a selection of photographs (Annex E.1.7._3). Speakers at the conference prepared presentations, which can be downloaded from the webpage www.odolnesidliska.sk (Annex E.1.7._4.)

Problems, solutions, delays, and the impact on the other actions depended on this action: The activity was postponed due to the approved extension of the project completion date.

E.1.8. Participation in local, national and international fora

Status of the sub-action: **completed**

Foreseen start date: June 2018 Actual start date: September 2019

Foreseen end date: December 2023 Actual end date: December 2023

Progress achieved: **completed.** We took part in 17 events where the information about the project was disseminated. More details about the activity can be found in Annex E.1.8._28

Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.1.9. Online media

Status of the sub-action: **completed**

Foreseen start date: June 2018 Actual start date: June 2018

Foreseen end date: Dec 2023 Actual end date: December 2023

Progress achieved: **completed.** The project Facebook page (https://www.facebook.com/resilientdistricts/) in Slovak was created on 25th of June 2018. To the date 15th of December 2023, there are 701 followers and this number is growing constantly, there are more than 230 posted information about the project and the different topics related to the climate change issues. Four newsletters informing about the public participation process of the public space revitalisation were sent to 244 subscribers via mail chimp service. (Annex E.1.9._1). AB BROZ informs about the project's outputs on its Facebook page (Annex E.1.9._2). During the duration of the project, 22 posts were published, which we can search using #LIFE_DELIVER. The total reach of all contributions was at least 9 724 interactions, because the exact data cannot be correctly identified with the old BROZ FB page. Another online medium is the website of the Deliver project within the domain BROZ https://broz.sk/projekty/deliver-sidliska-ako-zive-miesta-odolne-voci-zmene-klimy/, the data for visiting the Deliver website at www.broz.sk is given in (Annex E.1.9._3). The number of visitors varied from 120 to 326 per year, a total of 1 582 visitors visited the website.

Problems, solutions, delays, and the impact on the other actions depended on this action: Due to the many already existing communication channels (municipality monthly Karloveske

noviny, project Facebook and web page), we decided to use the form of newsletter only in case of important milestones such as the participatory process of the public space revitalisation.

E.1.10. Media communication
Status of the sub-action: **completed**
Foreseen start date: June 2018 Actual start date: June 2018
Foreseen end date: December 2023 Actual end date: December 2023
Progress achieved: **completed**
Since June 2018, when the project implementation started, 180 media outputs (151 articles - print and/or online, 29 other media outputs) have been published in various types of media: web, print, radio, TV. (Annex E.1.10._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.1.11. CReLoCaF (KLIMASKEN) user manual (connected to C.1.)
Status of the sub-action: completed
Deliverable/milestone: **deliverable no.11 - CReLoCaF** (KLIMASKEN) **user manual created**
Deliverable foreseen: October 2019 Deliverable completed: June 2021
Progress achieved: **completed.** Online tool CReLoCaF was programmed and published on https://www.klimasken.cz and https://www.klimasken.sk. For reasons of efficiency and user comfort, instead of a printed user manual, an online guide was prepared on the website of the KLIMASKEN online tool. The tool itself was successfully designed and prepared in the form of a clear and intuitive user interface, which is complemented by an interactive on-line user guide for maximum user comfort and usability: https://www.klimasken.sk/sk/ (see menu top right - Annex E.1.11._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: The user manual was only implemented after the testing phase, for which meetings in cities and feedback from city representatives were necessary. During the testing phase, feedback on the user experience and the operation of the tool was collected from several dozen users. On the basis of the information gathered and its evaluation, it was decided to incorporate the user guide in the form of an online guide directly as part of the Klimasken tool. This design was the most user-friendly and usable directly when working with the tool.

E.1.12. CReLoCaF (KLIMASKEN) leaflet (connected to C.1.)
Status of the sub-action: **completed**
Foreseen start date: August 2019 Actual start date: August 2020
Foreseen end date: October 2019 Actual end date: April 2021
Progress achieved: **completed**
The text of the leaflet in Slovak and English languages were completed in December 2020. The graphic design of the leaflets was completed and printed out in April 2021 (Annexes E.1.12._1 and E.1.12._2). We distributed the leaflet by post or at events (Annexes E.1.12_8 tab no.6).
Problems, solutions, delays, and the impact on the other actions depended on this action: Online tool CReLoCaF (Klimasken) is functional and was tuned after testing by partner cities. This was delayed as the main priority of all cities were measures related to the combat with the coronavirus pandemic. The leaflet was completed after the testing phase, for which meetings in cities and feedback from city representatives was necessary. The distribution of the leaflet will continue, and an update of the information on the tool will be prepared for the post-project period based on further experience with the operation and development of the tool.

E.1.13. Preparation of guide for addressing climate change (connected to C.2.)

Status of the sub-action: completed
Deliverable/milestone: **deliverable no.9 - Catalogue of possible adaptation and mitigation measures printed**
Deliverable foreseen: July 2019 Deliverable completed: March 2021
Progress achieved: **completed.** The catalogue in both Slovak and English was printed in March 2021 (Annexes E.1.12._4 and E.1.12._5). It was distributed by post or at events (Annex E.1.12._8. tab no.3). A comprehensive list of all printed materials with titles, numbers of production, distribution, links to download section, etc. is attached in Annex E.1.12._8.
Problems, solutions, delays, and the impact on the other actions depended on this action: The delay in this activity is connected to the delay of the preparation of the catalogue (activity C.2.3.) that has been postponed due to the need to incorporate various analytical and evaluation materials and slowed down compilation progress during COVID-19 crisis. The final version of the first edition catalogue was accomplished in October 2020.

Deliverable/milestone: **milestone no.13 - Input to the European Climate Adaptation Platform (Climate-ADAPT) the section "Adaptation Option" Catalogue of appropriate measures**
Milestone foreseen: August 2019 Milestone completed April 2021
Progress achieved: **completed.** In April 2021, information about the catalogue was published on the internet page of The European Climate Adaptation Platform, in the section Research and knowledge projects: https://climate-adapt.eea.europa.eu/metadata/projects/developing-resilient-low-carbon-and-more-livable-urban-residential-area. The catalogue was published on the European Climate Pact website: https://climate-pact.europa.eu/get-inspired/resources/catalogue-selected-adaptation-and-mitigation-measures_en (E.1.12._7b). The Licence Agreement. was signed on July 12, 2022. (Annex E.1.12._7a).
Problems, solutions, delays, and the impact on the other actions: See E.1.13

Deliverable/milestone: **milestone no.43 - Input to the European Climate Adaptation Platform (Climate-ADAPT) the section "Case studies" – Climate solutions implemented in public buildings and open spaces**
Milestone foreseen: December 2023 Milestone completed: December 2023
Progress achieved: **completed.** The brochure was published in November 2023 (Annex E.1.13._1a, E.1.13._1b). This document focuses on the main climate hazards that can affect urban environments. Lively communication took place between the Project lead expert Zuzana Hudeková and the Expert – European Climate adaptation platform/Climate-ADAPT from European Environment Agency (EEA) Kati Mattern in the final phase of the project (see the copy of the e-mail communication Annex E.1.13._2).
Problems, solutions, delays, and the impact on the other actions depended on this action, plan to catch up: Unfortunately, due to the postponed end of the activities C3 (deep renovation of public buildings) and C5 (renovation of public space), the case studies supposed to be published on the European Climate Adaptation Platform are not prepared yet. But the agreement was made, that at the beginning of April the discussion will follow how to best develop the case study about the climate solutions implemented in public buildings and open spaces in Bratislava-Karlova Ves Municipality in the frame of the project DELIVER. We suppose that the input to the European Climate Adaptation Platform (Climate-ADAPT) section "Case studies" will be done by the date due for the Final Report.

Deliverable/milestone: **deliverable no.29 - Innovative, prototype kind climate solutions and other measures towards the carbon resilience**
Deliverable foreseen: Nov 2023 Deliverable completed: October 2023

Progress achieved: **completed.** The brochure Climate resistant development: innovative solutions and measures in public spaces and buildings was prepared. (Annex E.1.13._1a and E.1.13._1b). Problems, solutions, delays, and the impact on the other actions depended on this action: In the view of the approved extension of the project this activity was postponed.

E.1.14. Handbook Deep renovations are smart
Status of the sub-action: **completed**
Foreseen start date: January 2023 Actual start date: December 2021
Foreseen end date: May 2023 Actual end date: May 2023
Progress achieved: **completed.** The handbook Deep renovations are smart was published in May 2023 (Annex E.1.14._1a and E.1.14._1b). 500 pcs in Slovak language and 100 in English language were printed. Details about the distribution are available in Annex E.1.12._8. The brochure is based on the activities that iEPD has been gradually addressing within the project, it is processed in SJ and AJ version under the title Resilient Settlements. In-depth renovation is a smart solution for housing estates. It is intended for professionals, architects and planners as well as public administration. This material briefly summarises our work to show that the renovation of apartment buildings can be planned with greater emphasis on the increasing energy performance requirements of buildings, as renovation is usually carried out once in a long period, 20-30 years. Examples of good practice, mostly from abroad, are also given in the brochure. Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.1.15. Hard-means promotion – project roll-up(s)
Progress achieved: **completed**
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: June 2018
Foreseen end date: September 2018 Actual end date: September 2018
Progress achieved: **completed.** The project roll-up(s) were produced in English, Slovak and Czech languages. The project poster in Slovak was created (Annex E.1.15._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.2. Networking and information sharing with other relevant projects, institutions in EU and general and local public
Foreseen start date: June 2018 Actual start date: October 2018
Foreseen end date: June 2023 Actual end date: December 2023
Beneficiary responsible for implementation: Mun_BA-KV

E.2.1. International working groups on adaptation
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: October 2018
Foreseen end date: December 2023 Actual end date: December 2023
Progress achieved: **completed.** We participated in 1 working group on adaptation as part of the Climate Alliance. On 8 September 2021, Zuzana Hudeková, the project lead expert, participated in the Online Working Group Workshop on adaptation that was organised as part of the Climate Alliance International Conference (CAIC21) in Wels, Austria (Annex E.2.1._1).
Problems, solutions, delays, and the impact on the other actions depended on this action: Covenant of Mayors meeting scheduled to take place from 14 to 15 February 2019 in Brussels was cancelled due to the strike of airlines. Due to the pandemic situation the active organisation of the working groups was limited during the implementation period of this activity. The Climate Alliance Adaptation WG restarted its activities only in 2024.

E.2.2. National platform of Covenant of mayors
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: June 2020
Foreseen end date: December 2023 Actual end date: December 2023
Progress achieved: **completed.** We participated in 4 events: More details about the activity can be found in Annex E.2.2._4. Problems, solutions, delays, and the impact on the other actions depended on this action: The cooperation with the Union of Slovak cities (UMS) led to the synergies to the activity E.1.6 - Professional seminars. We used the opportunity of the regular meetings of the National platform of Covenant of mayors to combine professional seminars with the Slovak Covenant of mayor's signatories.

E.2.3. Other projects with linkage to the LIFE DELIVER project topic
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: October 2018
Foreseen end date: December 2023 Actual end date: December 2023
Progress achieved: **completed.** We participated in 9 events/courses with linkage to the project topic. More details about the activity can be found in Annex E.2.3._10.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

E.2.4. Other LIFE adaptation projects dealing with urban adaptation topic
Status of the sub-action: completed
Foreseen start date: June 2018 Actual start date: October 2018
Foreseen end date: December 2023 Actual end date: December 2023
Progress achieved: **completed.** We participated in 3 events. More details about the activity can be found in Annex E.2.4._6. Problems, solutions, delays, and the impact on the other actions depended on this action, plan to catch up: N/A

E.2.5. (A in the proposal) **Workshops for school students, scouts and citizens**
Status of the sub-action: **completed**
Beneficiary responsible for implementation: BROZ
Deliverable/milestone: **milestone no.33 - half of the WS organised - biodiversity measures**
Milestone foreseen: October 2021 Milestone completed: June 2020
Progress achieved: **completed.** 62 workshops for students, scouts and citizens of the Bratislava-Karlova Ves Municipality (within the activity C6) were realised with 1540 participants in total (Photos: Annex E.2.5._1, E.2.5._1a, E.2.5._1b, E.2.5._1c and E.2.5._1d) and Attendance sheets: (Annex E.2.5._2, E.2.5._2a, E.2.5._2b, E.2.5._2c and E.2.5._2d).
Problems, solutions, delays, and the impact on the other actions depended on this action: The covid pandemic made it impossible to organise workshops for a longer period of time. Despite this serious event, the set goals were achieved.

E.2.6. (B in the proposal) **Online web camera in the nest**
Status of the sub-action: completed
Beneficiary responsible for implementation: BROZ
Deliverable/milestone: **milestone no.21 - online web camera in the nest installed**
Milestone foreseen: June 2020 Milestone completed: April 2020
Progress achieved: **completed.** 4/2020 - 10/2020 - nest for birds installed on the pine tree. A tit bird visited the nest, video from approx. 15 min.: https://www.youtube.com/watch?v=GwYYZkThVF8 (Annex E.2.6.). 04/2021 - 12/2021 nest for birds installed on the pine tree. A tit bird nesting is available: https://www.youtube.com/watch?v=NXW6gT6fKv0 (Annex E.2.6.). 05/2022 - 11/2022 nest for swift Apus apus installed on the roof of MS Kolískova building. Only wasps were nested:

https://www.youtube.com/watch?v=mPE_Hs3rXQY (Annex E.2.6.). 05/2023 - 11/2023 nest for swift *Apus apus* installed on the roof of MS Kolískova in a different place than in 2022. The solar panel had to be replaced with a new one due to damage in 07/2023. Apparently was pecked by birds. The solar panel was covered with plexiglass to prevent further damage. The nest was empty all season. (Annex E.2.6.). The web transfer is available at the web address: https://www.youtube.com/@broz1997/streams . Videos have 527 views.
Problems, solutions, delays, and the impact on the other actions depended on this action: The plan in the project was to install the camera in the nesting box of swift (Apus apus). The nesting boxes should have been installed on the walls of ZASD and MSK. The reconstruction of both buildings was postponed; therefore, the nest with online camera was installed at the area MSK. We tried to find optimal solutions for the technical problems – enough sunlight and attractive places for birds on the tree or on the roof of MS Kolískova building. While the nest was on the pine, it was occupied by tit birds. However, there was a problem with the lack of light, the photovoltaic cells were not charging enough, and there was a problem with data transmission. For that reason, the nest was moved to the roof of the MŠ Kolískova building. In two years, no bird has nested in the nest. One of the possible reasons may be the high intensity of sunlight. The supplier of this web camera transfer is IT technician Ján Paška who is enthusiastic about the activity and will continue to do it even after the end of the project. In the spring of 2024, the nest will be installed in the BROZ office building due to easier technical security and optimal intensity of sunlight.

E.2.7. (C in the proposal) Lectures/presentations for students in schools
Status of the sub-action: completed
Foreseen start date: September 2022 Actual start day: February 2020
Foreseen end date: May 2023 Actual end day: June 2023
Progress achieved: **completed.** In total, we have organised 32 lectures and presentations for students in school**s** with 732 participants (Annex E.2.5._1 and C.7.2._2). Problems, solutions, delays, and the impact on the other actions depended on this action: The covid pandemic made it impossible to organise lectures/presentations for a longer period of time. Despite this serious event, the set goals were achieved.

E.2.8. (D in the proposal) **One two-day study visit organised**
Status of the sub-action: completed
Beneficiary responsible for implementation: BROZ
Deliverable/milestone: **milestone no.28 - study visits organised**
Milestone foreseen: November 2020 Milestone completed: May 2019
Progress achieved: **completed**. The excursion took place on 22 and 23 May 2019. Employees of the Bratislava - Karlova Ves Municipality and management of primary schools and kindergartens managed by Mun_BA-KV visited three cities: Tulln (Austria), Lednice and Prostejov (Czech Republic), (Annexes E.2.8._1 and e.2.8._2).
Problems, solutions, delays, and the impact on the other actions depended on this action: We visited gardens where maintenance procedures are applied without chemicals and taking into account ecological relationships in nature. During the excursion, we saw what the results of natural green care in cities look like and we discussed the problems of establishing meadows in an urban environment. We received a lot of inspiration on how to change the care of greenery in the urban areas of Bratislava and its surroundings.

E.2.9. (E in the proposal) **Information materials**
Status of the sub-action: completed
Beneficiary responsible for implementation: BROZ

Deliverable/milestone: **deliverable no.16 - pens with project logo, magnets produced**
Deliverable foreseen: December 2019 Deliverable completed: July 2021
Progress achieved: **completed.** Pupils from ZSAD school were invited to design the project logo from 11/2019 to 02/2020 (Annex E.2.9._2). Their works were the inspiration for creating the project logo, prepared in the first half of the year 2020 (Annex E.2.9._1). Pens - 650 pcs produced with LIFE logo and project website 11/2019 (Annex E.2.9._3). 850 pcs produced with new project logo 11/2020 (Annex E.2.9._3a). Canvas bags - 600 pcs produced with the LIFE logo, the new project logo, the Ministry of Environment logo and the logos of all project partners 07/2021(Annex E.2.9._3b)
Problems, solutions, delays, and the impact on the other actions depended on this action: The change of the project coordinator within BROZ caused the delay of this activity. The new coordinator of biodiversity measures decided on more practical, widely usable promotional/information material such as magnets on the fridge. For that reason, beautiful canvas bags were made, but the activity was also delayed. Promotional materials were distributed to participants of WS, lectures/presentations, volunteer events, but also to project partners, supporters, etc. (Annex E.2.9._3e).

Deliverable/milestone: **deliverable no.17 - stickers with motives of animals produced**
Deliverable foreseen: December 2019 Deliverable completed: December 2019
Progress achieved: **completed**

- 4400 pcs of 22 kinds of stickers with pictures of the pollinating insect species, hedgehogs, lizards, frogs, and birds printed 12/2019 (Annex E.2.9._3)
- 4400 pcs the same stickers were reprinted 02/2020
- 5600 pcs of 4 kinds of stickers with endangered species like sparrow (twice), house Martin and swallow 12/2021 (Annex E.2.9._3c)
- 400 pcs of the fairy tale book Príbehy z lúk a mokradí printed 11/2021 (Annex E.2.9._3d)

Problems, solutions, delays, and the impact on the other actions depended on this action: By mistake, it was reported in the Midterm report that this Deliverable is ready in 12/2019. Only 4400 stickers were made, so it could not be fulfilled. Deliverable has been achieved 12/2021. BROZ published a fairy tale book about 5 animals and brought environmental issues closer to the wider public, including the smallest ones. One of the tales is dedicated to the protected urban species swift *Apus apus*, which had nowhere to return home due to the insulation of the building in which nested. Although the production of the book was not originally planned in the project, we decided to partially support the printing of the book. Even through a fairy tale, we can spread an important message about swifts, which share the same living space with us, and that is the urban environment. It is important and necessary to keep spreading awareness about the importance and need to protect swifts/animals or at least not endanger them. Swifts in the urban environment suffer from the loss of nesting opportunities due to insulation, and a fairy tale is one of the ways to bring this serious and unfortunately still relevant issue to the general public. Funds for printing the book were used within the Other cost category without a negative impact on the production of planned promotional materials. Promotional materials were distributed to participants of WS, lectures/presentations, volunteer events, but also to project partners, supporters, etc. (Annex E.2.9._3e).

Deliverable/milestone: **deliverable no.22 - Leaflet about the biodiversity enhancement measures in the residential urban areas**
Deliverable foreseen: June 2022 Deliverable completed: October 2023
Progress achieved: **completed.** The leaflet "How to support biodiversity in the urban environment" offers a number of simple solutions with photos, how residents can support and increase biodiversity not only in the urban environment. It has 10 pages and is printed in Slovak

and English language. (Annex E.2.9._4a and E.2.9._4b). Problems, solutions, delays, and the impact on the other actions depended on this action: The first drafts of the leaflet were created at the beginning of 2023, but the constant revision, additions and improvements took more time, so the activity was delayed and they were produced in 10/2023.

F.1. Overall project management and audit

Foreseen start date: June 2018 Actual start date: June 2018
Foreseen end date: December 2023 Actual end date: December 2023
Beneficiary responsible for implementation: Mun_BA-KV
Status of the action: **completed**

Deliverable/milestone: **milestone no.7 - whole team for project set up**
Milestone foreseen: December 2018 Milestone completed: December 2018
Progress achieved: **completed.** A total of 12 a face-to-face meetings of project partners were organised: 18.06.2018, 30.08.2018, 28.11.2018, 19.12.2018, 12.02.2019, 12.06.2019, 25.09.2019, 25.10.2019, 11.03.2020, 03.03.2022, 21.09.2021, 18.04.2023 (Annexes F.1._1 and F.1._2). 26 Skype were organised: 24.03.2020, 21.04.2020, 05.05.2020, 19.05.2020, 02.06.2020, 08.09.2020, 23.09.2020, 07.10.2020, 20.10.2020, 03.11.2020, 24.11.2020, 14.12.2020, 02.02.2021, 16.02.2021, 02.03.2021, 31.03.2021, 04.05.2021, 02.06.2021, 29.06.2021, 10.08.2021, 08.02.2022, 15.03.2022, 26.04.2022, 09.05.2022, 06.09.2022, 04.10.2022 (Annex F.1._3). 5 Monitoring visit by NEEMO/CINEA monitor – Mr. Peter Bezak were conducted on 20.-21.03.2019, 27.05.2020, 26.-27.04. 2021, 17.-18.05.2022, 16.10.2023 in the office of Mun-BA-KV + field visit. (Annex F.1._4). There was ongoing intensive communication between partners throughout the project implementation by e-mail and phone regarding realisation of activities, public procurements, etc. The financial documents of the partners have been checked. The coordination of all project actions has been maintained. The contract of co-financing with MoE SR was signed on 04.08.2019, monitoring and financial reports were sent to MoE, the reports were approved and the reimbursement for the reported period were done. The project implementation was supervised by SG. The SG was set up on 31st August 2018 (Annex F.1._5, F.1._6). It consists of 12 members. Six of them are staff from the project partner organisations (voting members), six are experts from different fields (non-voting members). The activities are guided by the approved Statute and Rules of Procedure of the SG (Annex F.1._7). The SG has met four times. (Annexes F.1._8 - F.1._23).
Problems, solutions, delays, and the impact on the other actions depended on this action: During the implementation of the project, a few replacements have been made in the project team. Some professionals strengthened the team under the MUWOG. Since March 2020, the project partners meetings could not have been realised face-to-face due to the new coronavirus outbreak measures.

Deliverable/milestone: **milestone no.6 - equipment for the project management purchased**
Milestone foreseen: December 2018 Milestone completed: December 2018
Progress achieved: **completed.** Two laptops with accessories and one printer were procured for the project staff. The costs were covered from overheads of the project.
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

F.2. After LIFE plan

Status of the action: completed
Beneficiary responsible for implementation: Mun_BA-KV/BROZ
Deliverable/milestone: **deliverable no.33 - After LIFE plan**
Deliverable foreseen: December 2023 Deliverable completed: December 2023

Progress achieved: **completed**. After LIFE plan was prepared. The long-term usability of the DELIVER project results will be ensured by several supporting tools, the foundations of which were built as part of the project activities. (Annex F.2._1 and F.2._2)
Problems, solutions, delays, and the impact on the other actions depended on this action: N/A

6.2. Main deviations, problems and corrective actions implemented

The global crisis caused by the COVID19 pandemic has resulted in extreme market price increases, especially in the construction sector. It is a well-known fact that prices on the building materials market have risen at record levels and they were therefore incomparably higher than at the time of preparation, submission and approval of application and subsequently at the signing of project contracts. Due to the high complexity of the deep renovation and limited financial resources, it was necessary to divide the work into several stages. The work was therefore carried out gradually, depending on the current state of the pooled resources. These deviations didn´t have an impact on the final outcomes of the project but for that reason we have applied for an extension of the project for 6 months.

6.3. Evaluation of Project Implementation

- Methodology applied:

The project's success lies in its complexity and the interconnectedness of its various activities. This unique approach fosters a synergy between adaptation and mitigation goals with regards to biodiversity. The project's methodology further strengthens this effect.
For example, the Klimasken online tool played a crucial role in implementing other project activities. This web-based platform facilitates monitoring, evaluation, management, and presentation of information on adaptation and mitigation activities for cities, districts, and individual buildings. Notably, Klimasken served as a valuable resource for the Climate Action Plan (CAP) C2 by providing both a baseline evaluation and a tool for monitoring its implementation success.The same for the activities related to the buildings refurbishment (C4 for residential buildings and C3 for public buildings).
Similar to the Klimasken online tool, the Catalogue of adaptation and mitigation options proved to be a valuable resource throughout the project. It served not only during the preparation of the Climate Action Plan (C2) but also during the initial stages of formulating strategies for renovating public spaces and residential buildings (C4, A2). The Catalogue played a key role in ensuring these renovations balanced adaptation and mitigation measures effectively and taking into account the biodiversity promotion.
In conclusion, all the project's activities effectively achieved its goals and objectives in a cost-efficient manner.

- Compare the results achieved against the objectives and expected results foreseen:

Quantitative and qualitative information about the actions implemented in the frame of the project compared with the objectives and expected results in the revised proposal is in the Annex F.1._32 .

- Indicate which project results have been immediately visible

The project is proving the possibilities of positive synergies among the adaptation, mitigation and biodiversity protection. As concrete example could serve the greenspace nature friendly maintenance, e.g. reducing the lawn mowing, especially during the summer hot and dry periods will have the positive effects on biodiversity, providing flowers and shelter for insects and pollinators and in the same time the reduced cutting of grass will decrease the CO2 emissions. Actually, there are 1,7 hectares (17 184 m2) of lawns included in the system with the reduced lawn mowing - the map with the table in (Annex C.6._7d).

There are visible results in relation to the biodiversity promotion: 7 feeding boxes for wintering birds, 35 nesting boxes for birds, 4 wintering places for hedgehogs, 6 hiding places for reptiles, 10 drinking places for animals, 2 big a 18 small insect hotels, 2 place with dead wood, flower beds with total size of 145 m2, grass cutting changed to maintain flowering grasslands on 17 184 m2, 100 trees, 400 shrubs, 41 climbing plants within green vertical wall, 2 green roofs with succulents, support and protect natural seedlings at 5 places, 4 apiaries, 4 climate ponds created with total area ca 286,5 m2, built gazebo and reconstructed 4 roofs of civil protection shelters and 1 container for capturing and collecting rainwater, 2 green roofs, educational trail, production of promotional materials. Within the results will only become apparent after a certain time period, the improvement of microclimatic conditions after the grow up of the planted trees. The near nature green spaces management is included in the Climate Action Plan as an adaptive and mitigation measure and there the visible results will be apparent after a certain time period. Moreover, based on the introduction material about the basic hints and requirements how to deal with the renovation of open public spaces with the regards to the climate change impacts as well as based on the "feelings map" results Bratislava Karlova Ves Municipality already realised some interventions on the public spaces - e.g. shading facilities and drinking fountains (on the Pribišova squares and square of sv. Frantiska), establishing green walls (by planting climbing plants) and rain gardens and installing rainwater barrels for watering the plants. The most visible project outcomes stem from Activity C3 and C5 activity: the deep refurbishment of public buildings (Primary School A. Dubceka and Kindergarten Koliskova) as well as the pilot open space renovation. The buildings renovation involved a comprehensive suite of improvements, that are already visible, including roof and wall insulation, window replacement, installation of solar and photovoltaic panels, external shading systems, rainwater harvesting system, promoting biodiversity, green roof installation above the main entrance, nesting boxes for protected animals, vegetation walls made of stainless-steel mesh with climbing plants, and vertical cable systems with winding plants prevent overheating of the building etc. The results are fully visible as well as in the reconstructed open space Kaskady where the solution aimed at the sustainable drainage systems (SUDs) to capture and use rainwater and slow and enable to infiltrate the water runoff has been realised, including two wetland areas that have been created, where the rainwater overflow from the underground tanks is situated; seven raingarden infiltration areas have been created, as well as 2 infiltration swales. These infiltration areas are created as flowering meadows with a variety of blooming species favourable for pollinators which are outstanding at promoting biodiversity and providing habitats for different species. The moisture that gradually evaporates from wetland and retention areas is positively influencing the microclimate especially during hot summer days. The planted vegetation (trees and shrubs) will mature over time, further enhancing this cooling effect. These complex interventions were financed also by other donor´s sources and the own budget of the Bratislava Karlova Ves Municipality.

- If relevant, clearly indicate how a project amendment led to the results achieved

Thanks to the 6 months extension of the project implementation we succeeded to fully complete renovation of the primary school (Action C3). We had more time to monitor and evaluate the effectiveness of the implemented measures (Action D1), to compare the energy and water consumption before and after the in-depth renovation (in case of the kindergarten after 12 months and in case of the school after a few months) and we got more time to organise consultations for local inhabitants in the newly created presentation room of the Community Climate and Biodiversity Educational Centre (CoCliBEC) located in the building of the primary school (Action C7). The extension of the project allowed us to conduct a 3rd questionnaire survey as part of monitoring the socio-economic impacts of the project (Action

D.2) in the same time period in which the previous two surveys were carried out (in September), which ensured better comparability with the previous two surveys.

- Describe the results of the replication efforts.

The replication effort in this project is incorporated in the methodology, structure of partnership as well as the relevant stakeholders and interested public. There are several possibilities for replications, especially in Slovakia and the Czech Republic. The intensive and regular exchange of our experiences and results of the projects (especially related to the C1 and C2 activities) with the Union of Slovak Cities and Municipalities and the National Platform for Covenant of Mayors for Climate and energy led already to some first positive feedbacks from different Slovak cities, especially of those, that are among the signatories of the Covenant of Mayors for Climate and energy (e.g. Piestany Municipality is using the Klimasken tool). The project's activities, particularly the sustainable rainwater practices implemented under deliverables C5 and C6, hold significant potential for replication. The knowledge gained through the project has already been applied in the "Klima nás spája" ("Climate Unites Us") initiative led by the Zivica NGO (https://www.klimaspaja.sk/). The Slovak Environment Agency developed two national-level methodologies that incorporate outputs from the DELIVER project. These methodologies will promote e.g. the replication of tools like Klimasken (https://metodiky.sazp.sk/. The further replication of the tool Klimasken could bring its inclusion among the tools for evaluation of the building´s resilience (Table 4.4 Identified building resilience rating approaches) on the frame of EU-level technical guidance on adapting buildings to climate change (https://op.europa.eu/en/publication-detail/-/publication/7cca7ab9-cc5e-11ed-a05c-01aa75ed71a1/language-en).

- Indicate the effectiveness of the dissemination activities and comment on any major drawbacks.

Effective dissemination ensures not only the efficient distribution of new knowledge, but it raises awareness and encourages collaboration. Our effective dissemination ensured the visibility of the project by promoting it and the activities within it. As written previously, involvement of powerful “replicators” institutions (Union of Slovak Cities and Municipalities and the National Platform for Covenant of Mayors) during the project implementation is very effective to reach other cities and Municipalities. Dissemination activities also yielded new collaborations with various organisations and stakeholders. For example, the project beneficiary (Zuzana Hudekova) is now consulting on master's and doctoral theses at the Faculty of Architecture and Design on topics related to DELIVER. Additionally, a successful collaboration was established with the "Klima v obcích" project (https://klimavobcich.cz/sk/vzdelavaci-program/temy-vzdelavania/). No significant drawbacks were encountered during the dissemination of project information.

- Policy impact
  - Describe project achievements which supported legislation (regional, national, EU)

The project is already contributing to the implementation of the Fauna-Flora-Habitat Directive, Birds-Directive, to the EU Green Infrastructure Strategy (2013) by the “visible” results from C5 activity. EU Biodiversity Strategy to 2020 (2011). Namely the proposal supports the fulfilment of the Target 1 of Biodiversity strategy – *Protect species and habitats* and Target 6 - *Help stop the loss of global biodiversity*. The project is supporting the objectives of the national Biodiversity Strategies as well.

The Climate Action Plan (C2) contributes to achieving greenhouse gas emission reduction targets set by both the Paris Agreement (at least 40% reduction by 2030) and the EU Green

Deal (at least 55% reduction by 2030, compared to 1990 levels). Moreover, the project Deliver is contributing to the EU Strategy on adaptation to climate change (2018) and to the initiative Covenant of Mayors for climate and energy. This contribution is achieved through two main approaches:

- Direct Actions: Implementing concrete investments and piloting demonstration actions on public buildings and open spaces (as outlined by the project's KPIs).
- Indirect Influence: Providing guidelines, sharing best practices, information, and experiences with cities in Slovakia, Czech Republic, and beyond. This knowledge transfer allows cities with similar residential areas to potentially replicate the Deliver project's successful strategies.

- Indicate the main barriers identified and the action(s) undertaken to overcome them

The main barriers are identified by the unclear ownership of land, especially in case the restoration of the Jurigovo square, where an application for the reconstruction permit can be submitted and the reconstruction can begin only after the agreement with the owner of the square BCCO is signed. All necessary negotiations with the owner have been suspended due to the coronavirus crisis and we suppose that the whole process will restart next year at the earliest. We are trying to do everything what is in our power to proceed swiftly. The most significant barrier that has hampered our works is resulting from the COVID-19 pandemic situation. The global crisis caused by the COVID19 pandemic has resulted in extreme market price increases, especially in the construction sector. It is a well-known fact that prices on the building materials market have risen at record levels and they were therefore incomparably higher than at the time of preparation, submission and approval of applications and subsequently at the signing of project contracts. Due to the high complexity of the deep renovation and limited financial resources, it was necessary to divide the work into several stages.

- Describe any policy developments that resulted from your project activities

Our effort to make the relevant positive changes in the legislation framework has some partial positive effect. Especially through the activity C8, we successfully strengthened the consideration of climate change impacts within the amendment of Decree No. 170/2021, implementing Act No. 543/2002 on the Protection of Nature and Landscape. The process of obtaining a building permit for the Kaskády open space resulted in the development of a methodological guide on water construction approval in relation to the blue-green infrastructure in February 2021. This guidance was created by the Director General of the Water Section at the Ministry of Environment and widely distributed. Based on the Kaskády open space renovation (C5), the methodological guide promotes blue-green infrastructure solutions and facilitates a smoother approval process with relevant authorities. BA-KV has prepared a recommendation document (Draft of technical standards "Sustainable rainwater management") for the legislation of sustainable management of rainwater in the residential environment, with examples of legal regulation of the decentralised method of drainage from abroad. This was sent to the MoE (water section).

- Describe how the project delivered the results foreseen in the Grant Agreement form B3 “EU ADDED VALUE OF THE PROJECT AND ITS ACTIONS”.

The implementation of the project contributes so far to the EU goals in various ways:

1. The project largely contributes to the development and implementation of Union policy on climate change adaptation, including mainstreaming across policy areas:

Already contributed by the project:

- improving the knowledge base for the development, assessment, monitoring, evaluation and implementation of effective climate change adaptation and mitigation through the Klimasken“ (C1) on-line tool for monitoring, evaluating, managing and

presenting information on adaptation and mitigation current status, progress and partial activities of cities, city areas, and individual buildings

- using the integrated approaches for climate change adaptation and mitigation in balanced way through the ClimateAction Plan (C2). This approach is very relevant to the SECAP methodology and therefore could be further used in the frame of Covenant of Mayors for climate and energy

2. Project increases international cooperation – Project has the Czech partner Ci2- and this leads to exchange of information and know-how in planning and city development
3. The methods used for the successful implementation of the project could be replicated beyond the borders of Slovakia and Czech Republic in other European cities, especially with similar urban structure around Europe.
4. Lessons learned from the project could be used for debates on national and European levels about climate resilience in cities in general

6.4. Analysis of benefits

1. Environmental benefits
   a. Direct / quantitative environmental benefits:

The Klimasken tool has fostered a stronger knowledge base in common consolidated climate resilience and carbon footprint assessment. It is now a valuable resource for establishing baseline conditions and monitoring progress towards improved climate resilience in cities and on the level of buildings. The project championed an integrated adaptation and mitigation approach, prioritising eco-based climate solutions and biodiversity promotion. This approach was demonstrably successful. Not only in the framework of the Climate Action Plan (C2) development (that was adopted by the Municipal Authority (MA), it became a core principle in the Catalogue of adaptation and mitigation options (C2). Additionally, the approach guided the development of energy optimization solutions for two model residential buildings (partially refurbished and non-refurbished) aiming to achieve "Near Zero Energy Building" standards (Action C4). This integrated approach was further implemented in the successful deep refurbishment of public buildings (Primary School A. Dubceka and Kindergarten Koliskova) and the pilot open space renovation (Kaskády).These combined efforts demonstrably enhanced the climate resilience of Municipality Karlova Ves. Baseline and final evaluations conducted using the Klimasken tool (after the accomplishment of the actions C3, C5, and C6) provided concrete evidence of this improvement.The detailed reduction of greenhouse gas emissions, energy savings as well as other environmental indicators has been evaluated and are presented in the KPI online tool (Annex F.1._33).The project demonstrably influenced relevant policies. Notably, it strengthened the consideration of climate change impacts within Act No. 543/2002 on the Protection of Nature and Landscape. This achievement is reflected in the amendment of Decree No. 170/2021., which incorporates our proposals.Based on the Kaskády open space renovation (C5), the methodological guide focused the on water construction approval in frame of the Water Act, No.364/2004 in relation to the blue-green infrastructure has been elaborated and distributed by the Director General of the Water Section at the Ministry of Environment. This guide promotes these solutions and facilitates smoother approval processes with relevant authorities.

   b. Qualitative environmental benefits

The project's emphasis on integrating adaptation and mitigation strategies, prioritising eco-based climate solutions, fosters better planning. Previously, these strategies were often addressed separately, potentially leading to sectoral maladaptation. The project's successful implementation of this approach is evident in the approved Climate Action Plan (C2) and other

actions, including the Catalogue of adaptation and mitigation options, the energy optimization proposals for two model residential buildings, and the deep refurbishment of public buildings and open spaces. The changes in behaviours and other qualitative changes are measured and monitored by the D2 action. The project's impact extends beyond its core activities, generating positive spin-off effects in other areas. These include e.g. the promotion of sustainable and climate-resilient construction practices and advancements in sustainable urban planning, particularly in the development of climate-neutral city districts. This focus on integrated solutions fostered a productive collaboration with the Faculty of Architecture and Design. The project also yielded positive spin-off effects in green and open space management, promoting sustainable and nature-based approaches**.** By planting of preferably native trees in the project selected areas, as well as by the use of the natural reproduction and preserving of the tree´s sprout as part of the vegetative reproduction we hope that we set up the positive trend towards the native tree species composition ad to show other possibilities, how enforce the green infrastructure by fostering the biodiversity promotion. Specific implementation actions in the adaptation area included measures to support biodiversity in public spaces (differentiated mowing regime, cooling with vegetation, building shelters for animals, building green walls and roofs, etc.), adaptation measures in public spaces and buildings (water retention measures, rainwater retention, cooling of spaces by shading, installation of water features and drinking fountains, green roof on the local authority building, planting of trees and shrubs, etc.). All measures are listed and quantified in detail in Annex F.1._25.

2. Economic benefits

FTE qualified jobs created during the project duration is 12,85 jobs for qualified staff. Beyond 5 years: 1,6 full time position for Bratislava-Karlova Ves Municipality and app. 20%x4 partners = 0,8 full time position for partners who will be responsible for sustainability and replicability of project activities, in total 2,4 jobs for qualified staff. The details for all positions are available in (Annex F.1._24). In order to monitor and evaluate the effectiveness of the implemented measures we hired the services of an energy consultant, to quantify savings, compare the energy and water consumption before and after the in-depth renovation. The documents Evaluation of Operating Costs and Experiences after Deep Renovation of Primary School ZSAD Building and MSK building was prepared with the aim of monitoring the current operation of technologies, energy and CO2 savings, and preparing proposals for optimising the operation of prototype technological equipment and measures (Annex C.3.2._3, Annex C.3.2._4). All savings are quantified and explicated in detail in KPI online tool (Annex F.1._33).

3. Social benefits

The participatory approach with the involvement of the local inhabitants, that was used in the process of the public space renovation blue print (A2) enhanced social interactions as well as the community life and cohesion. The assessment of the vulnerability to climate change took into the account the sensible groups of inhabitants and their ability to cope with the hazard related the to climate change. The adaptation options, included in the Climate Action Plan are addressing this impact and have the ambition to significantly improve the health situation during the summer heats. The social benefit that could arise in the future is also based on the effort to plant edible plants on the public spaces - e.g. on the Pribišova square where some edible climbing plants as kiwi (*Actinidia*), raspberry (*Rubus idaeus*) and *Akebia quinat*a, commonly known as chocolate vine were planted in form of the vertical greenery. The consultancy and educational activities offered by the Community Center for Climate and Biodiversity have demonstrably enhanced social interaction and fostered a stronger sense of community.

4. Replicability, transferability, cooperation:

Klimasken (C1), the online tool piloted in tier cities, has demonstrated significant replication potential. Following successful testing, it is now being adopted by other municipalities, districts, and building owners. Klimasken's value as a building resilience evaluation tool is evident by its ongoing use in climate resilience assessments across various municipalities and buildings in Slovakia and the Czech Republic, as illustrated in the provided map (see the map https://www.klimasken.sk/en/verejne-modely. The easy project measures for enhancing biodiversity are replicated by other schools, kindergartens and the general public. The knowledge gained through the project has already been applied in the "Klima nás spája" ("Climate Unites Us") initiative led by the Zivica NGO (https://www.klimaspaja.sk/) and practically replicated in several localities in Slovakia. Among the activities to support biodiversity in the urban environment, hiding places for hedgehogs were replicated 1 at ZS Tilgnerova in Karlova Ves and Průger-Wallner garden, 2 in Ružinov and 5 in Petržalka. The shelter for reptiles was created on the model of the project at the NPR Jursky Sur. Others were insect hotels in Průger-Wallner garden, Tekovské Lužany, Ružinov and NPR Jursky Sur and the installation of nesting boxes by the public in Lamač. (Annex C.6._17).

5. Best Practice lessons:

The project involves a demonstration aspect through the complex approach in the view of balancing adaptation and mitigation goals with regards to biodiversity promotion in the residential area with prevailingly prefabricated concrete buildings. In some parts of the project, we already used a combination of best practices, approaches and tools already existing. Several project outputs stand out as replicable best practices. These include the Klimasken tool (C1) for climate resilience assessment, the balanced approach to adaptation and mitigation strategies in the deep refurbishment of public buildings (C3), and the open space renovations that prioritise biodiversity (C5,C6). These elements have the potential for wider implementation. The establishment of the Community Center for Climate and Energy (C7)within the renovated school building exemplifies another best practice. This initiative effectively combines energy savings and building retrofitting with educational programs for pupils, the local community, and a broader audience of interested individuals and professionals.

6. Innovation and demonstration value:

The project's innovative and demonstration value lie in its focus on addressing the specific challenges of prefabricated concrete buildings, a common residential type in the region. To tackle this built environment effectively, the project developed innovative processes, tools, and mechanisms. The project showcases a unique, comprehensive approach. It begins with evaluating the current climate resilience using Klimasken (C1). It then progresses to an integrated adaptation and mitigation strategy that prioritises eco-based climate solutions. This approach is demonstrably successful, as evidenced by its incorporation into the Climate Action Plan and its application in the deep refurbishment of two public buildings and the renovation of an open space. Previously, the lack of "climate-resilient" adaptation and mitigation strategies, action plans, and concrete demonstration measures for public, residential buildings, and public open spaces presented a significant barrier. This project filled this gap by developing innovative and replicable prototype solutions.

7. Policy implications:

Activity C8 demonstrably strengthened the consideration of climate change impacts within Ministry of Environment Decree No. 170/2021 Z.z., which implements Act No. 543/2002 Z.z. on the Protection of Nature and Landscape. Through this activity, the project successfully

advocated for the inclusion of specific conditions that address climate change concerns, particularly in relation to R-USES and M-USES processes. Based on the Kaskády open space renovation (C5), the methodological guide related to the so called "Water act", No. 346/2004. This methodological guide precise the water construction approval process in relation to the blue-green infrastructure and has been elaborated and distributed by the Director General of the Water Section at the Ministry of Environment. This methodological guide promotes these solutions and facilitates smoother approval processes with relevant authorities. The project faced challenges, bottlenecks and barriers due to shifting policy priorities following governmental changes. For instance, our detailed comments on the draft Building Act became obsolete when the new administration opted to develop the legislation entirely from scratch. Similarly, the progress on the draft Climate Act and its adoption process has been slower (or even stopped) than anticipated originally.

7. Key Project-level Indicators

We succeeded in filling all KPI values in the online tool thanks to online consultations with the monitor Technical monitor ELMEN EEIG and we sent them for verification on 20/02/2024. There are no significant deviations from the targets set initially. Majority of KPI targets were met, the only problems to be reported are connected with the fact that some of the indicator values were not setup correctly for the value at the beginning. Everything is explained in detail in the comments in the KPI online tool (Annex F.1._33). We have decided to delete one indicator no. 7.3 after consultations with the monitor and we have replaced it by ind. 7.1 and 7.2 which were more suitable for our case.

8. Comments on the financial report

A) Personnel costs - explanatory notes to financial statement:

Mun BA-KV:

- In the case of some employees the calculation of daily rates based on annual personnel costs is slightly exceeded. The explanation is that our salary system automatically includes in the calculation of the annual holiday compensation the average annual salary, including bonuses (half year and at the end of the year) are part of the beneficiary's usual remuneration practices and are based on objective conditions. They are paid to the employee regardless if they are involved in EU-funded projects and they are paid in accordance with the national law and collective labour agreement. The project staff consists of specialised experts in the field of climate mitigation and adaptation with extensive experience in international project management. Moreover, as a CB they are responsible for overall financial and administrative management of the whole project and in charge of finding additional financial resources for the project. For these reasons the daily rates could be slightly higher than planned average for these positions.
- The planned position of Project Manager was at the beginning splitted between two positions Project Coordinator and Technical manager with separate job descriptions carried out by two persons (P.Vancova, E.Surovkova). From January 2020 it was again covered by one person (D.Mekinova). After leaving the institution for personal reasons in May 2023, the position was covered by Project Financial Manager (L.Nemcová) until the end of the project from own resources of the beneficiary.
- The planned positions of Financial and Project assistant and Project accountant were covered from September 2018 by one person (Z.Koskova). As the daily rate in the approved budget

was different for each position, the calculation of the rate for this cumulated position was based on a weighted average taken into account the working time for each position.
- The position of Project Communication Manager and Project Lead Expert was covered by one person (Z.Hudekova). At the beginning of the project a mandate contract was signed with this member of staff (procurement procedures were respected). Based on a personal decision of Z. Hudekova and a mutual agreement with the employer, the mandate contract was cancelled on 31 August 2018 and work on the project has been carried out on the basis of an employment contract with the same remuneration conditions since September 2018.

BROZ: For BROZ employees, the 1720 method was used mostly. During the duration of the project, inflation increased, which resulted in an increase in the prices of services and materials, the total cost of living increased, therefore the increase in daily rates, especially in 2023. The higher daily rates reflect the work commitment of the BROZ team, and the difference will be covered from the beneficiary's own resources. Ms Hálková was a qualified expert in the field of project management and had a heavy workload, therefore the daily rates were increased. Similarly, Ms. Miláčková, a qualified expert who was employed on the project for the last months for 10% working time. For the calculation of the daily rates timesheet method was used instead of the 1720 method. Hladík and Lačný had an agreement to carry out the work. Their increased daily rates were due to short but intense hard work.

Ci2: Changes in personnel costs or positions on the project have been explained in the comments above. All changes are within budget limits and do not exceed the planned daily rates. However, during the implementation of the project, for the reasons explained, the number of planned hours for each activity was exceeded. Daily rates of individual experts working on the project are in line with this and result also from the reasons explained.

IEPD: There were no significant transfers between positions in the iEPD, the planned hours per day rate were not exceeded. The increase in staff daily rates was due to the reimbursement of compensations for employee holidays.

CDI: Daily rates in personnel costs were slightly exceeded in 2021 for P. Stano and M. Schvalb senior experts. These rates were calculated by the pre-set formula of the report that is different from CDI´s personnel costs calculation (explained in the attached internal guideline). Although hourly and daily rates are higher than rates indicated in the project budget, the final amounts (claimed personnel costs) are amended by using coefficient in column X whose purpose is to reflect the internal CDI´s calculations. (Using this coefficient, the hourly rate equals 17,95 EUR for P. Stano and 17,96 EUR for M. Schvalb, resulting in a daily rate of 143,60 for P. Stano and 143,68 for M. Schvalb - all within the budget limits).

B) Budget transfers incurred from 15/06/2018 till 15/12/2023

In line with the ANNEX I: ARTICLE II.22 — BUDGET TRANSFERS - we have adjusted the estimated budget set out in Annex II by transferring only up to 20% of the budget between budget lines.

1) Mun BA-KV: All transfers occurred were up to 20% of the budget between budget lines, they are summarised and explicated in detail in Annex F.1._29.

2) BROZ - necessary costs not foreseen in the budget:

Water collecting Gazebo and 5 reconstructed roofs of civil protection shelters, two of which are green for a total of 17 935,18 EUR are in external costs. The implementation of the activities was necessary due to the absence of water in the ZSAD area. Thanks to these measures, we have water, which is essential for the survival of the planted plants. (Annex C.6._7g). Fairy tale book about 5 animals including swifts, which are still threatened by the insulation of buildings in cities. Although the production of the book was not originally planned in the project, we decided to partially support the printing of the book. Even through a fairy tale, we can spread an important message about swifts, which share the same living space with us, and that is the urban environment. It is important and necessary to keep spreading awareness about the importance and need to protect swifts/animals or at least not endanger them. Swifts in the urban environment suffer from the loss of nesting opportunities due to insulation, and a fairy tale is one of the ways to bring this serious and unfortunately still relevant issue to the general public. Funds for printing the book - 3 065,48 EUR were used within the Other cost category without a negative impact on the production of properly planned promotional materials. (Annex E.2.9._3d). Canvas bags were made instead of magnets, because they are more practical, widely usable promotional/information material such as magnets on the fridge. Funds for producing the canvas bags - 1 843,20 EUR were used within the Other cost category without a negative impact on the production of planned promotional materials. (Annex E.2.9._3e)

Transfer budget: Personnel to Consumables and External assistance

1. Transfer of 4 000 EUR from Personnel costs (Co-financer's contribution) to Consumables costs (Co-financer's contribution) was needed due to the fact that increased spending of the Consumables costs on work materials and aids due to vandalism and for the implementation of originally unplanned activities - green roofs. Date of transfer: 18.02. 2020
2. Transfer of 12 857,00 EUR from Personnel costs (Co-financer's contribution) to External Assistance costs (Co-financer's contribution) was needed due to the fact that an increase in the prices of materials and services and due to the assumption of increased financial expenditure in connection with the activity of replacement of impermeable surfaces based on first estimated price offers. Date of transfer: 4.03. 2023
3. Transfer of 1 443,00 EUR from Personnel costs (Co-financer's contribution) to Consumables cost (Co-financer's contribution) was needed due to the fact that increased spending of the Consumables costs on work materials and and unplanned purchasing of work materials and tools for repairing implemented measures. - Date of transfer: 4.03. 2023

3) IEPD - budget transfers incurred from 15/06/2018 till 15/12/2023:

Other costs: the cost of the brochure was saved in the amount of € 1165.- because part of the expected work on the brochure was not supplied by the contractor. The work was provided by Mrs. Ľubica Šimkovicová

- External services: € 12.- was saved: This was due to the rounding off of VAT. The amount was transferred to Personnel expenses:
- Travel expenses: € 2 102.- was saved by not carrying out all business trips. The amount was transferred to Personnel expenses:
- Personnel expenses: an increase of € 3 279.- was made, mainly due to an increase in work towards the end of the project which was not budgeted originally. The expenses was used to prepare workshops:

- 19.1.2023, Seminar: Prefabricated apartment buildings - panelstory in the context of the energy crisis: https://iepd.sk/events/workshop-panelove-bytove-domy-panelstory-v-kontexte-energetickej-krizy/
- 28.9. 2023, Seminar: Increasing the resilience of buildings to climate change: https://iepd.sk/pozvanka-na-seminar-zvysovanie-odolnosti-budov-na-zmenu-klimy-28-9-2023/

8.1. Summary of Costs Incurred

PROJECT COSTS INCURRED				
	Cost category	Budget according to the grant agreement in €*	Costs incurred within the reporting period in €	%**
1.	Personnel	966 850,00	1 080 413,38	4,6 %
2.	Travel and subsistence	32 148,00	19 562,67	
3.	External assistance	477 371,00	345 788,21	
4.	Durables goods: total non-depreciated cost			
	- *Infrastructure sub-tot.*			
	- *Equipment sub-tot.*			
	- *Prototype sub-tot.*	750 000,00	803 29,33	2,16 %
5.	Consumables	9 237,00	15 194,91	0,24 %
6.	Other costs	50 865,00	35 792,96	
7.	Overheads	**160 052,00**	**160 983,60**	
	TOTAL	**2 446 523,00**	**2 460 765,06**	7%

*) If the Agency has officially approved a budget modification through an amendment, indicate the breakdown of the revised budget. Otherwise this should be the budget in the original grant agreement.
**) Calculate the percentages by budget lines: e.g. the % of the budgeted personnel costs that were actually incurred

8.2. Accounting system

Include among other aspects:

- Brief presentation of the accounting system(s) employed and the code(s) identifying the project costs in the analytical accounting system

Each beneficiary uses double-entry bookkeeping system. All project costs of CB are recorded in the analytical accounting system named TRIMEL, s.r.o. The costs for the project DELIVER are identifiable by using a specific project accounting code:

- 2 - Municipality Bratislava-Karlova Ves (CB)
- 126 - BROZ (AB)
- 1801– iEPD (AB)
- 44 – CDI (AB)

- 40 – Ci2 (AB)

As the CB is a municipality, we have to record all costs in a general government budgeting system as well. Budget for the project DELIVER is identifiable by using a specific budget line 2.7. Projekt DELIVER, accounting centre 2, and EU resources are under code 38, own resources 41, co-finance by the Ministry of Environment - 11B6 a 13B6.

- Brief presentation of the procedure of approving costs

A Cooperation Agreement was signed between CB and each AB where the procedure of approving costs was described and the time table of intern reporting to CB was set up. The subject matter of this Agreement is the contractual relationship between the CB and AB which describe the responsibilities of main activities of AB and the process of financial and administration duties within the DELIVER project. Each beneficiary accounts the costs in their accounting system. Every 12 months each beneficiary sent the financial table (format used for LIFE reporting) with scan or copies of all documents declaring the incurred costs (invoices, bank transfers, bills, documentation from procurement procedure, etc.) to CB. The relevant personnel in CB (Financial and Project Assistant, Project Manager and Project Financial Manager) checked all the information and each document and if it was not correct, the corrections were asked from representatives of AB. All information was collected in one report. Only after the approval that all documents for incurred costs are correct, the relevant payment for incurred costs were to be paid to AB.

- Type of time recording system used, i.e. electronic or manually completed timesheets

One type of common LIFE electronic timesheet was used by AB and CB. The template was updated by CB each year. After the monitoring visit of the NEEMO representative on 20 – 21st March 2019, we were instructed that timesheets for the project are not necessary if the employees work for a fixed percentage of time. From that reason the employees of AB BROZ and AB Ci2 did not use the timesheets from 01/01/2019 and CB also did not use the timesheets from 01/01/2021 after the submission of the Monitoring Report in January 2021 and consultation with the Ministry of the Environment, which was a co-financier of our project.

iEPD – used the LIFE electronic template. After filling the template electronically, the form is printed and signed. During the last monitoring visit iEPD informed the monitor that as there is only one statutory person (L.Simkovicova) so that she signs the timesheet for herself without using the name and signature of the supervisor.

CDI – used the LIFE electronic template and because CDI is involved in more LIFE projects this is reflected in the TS templates by adding two separate columns. After filling the template electronically, the forms were printed and signed.

Bratislava Karlova Ves Municipality – used the LIFE electronic template. After filling the template electronically, the forms were printed and signed. But these documents serve only as an internal documentation for the HR department for processing monthly salaries.

- Brief presentation of the registration

Each employee who was supposed to fill the timesheet, filled the time spent in the project to the electronic version of the timesheet. After the full month was completed, the timesheet was printed, signed by employee, checked by supervisor and if it was correct, it was signed by the supervisor and scanned to the reporting archive. If it was not correct, the employee corrected the mistakes and the new printed version was signed again by both – employee and supervisor. This was done on a monthly basis.

- Brief explanation on how it is ensured that invoices contain a clear reference to the LIFE project

Each beneficiary took care that its invoices have all incorporated project code and name in the text of invoice. Each supplier was asked to put the project code LIFE on the invoice. In some cases when the products were ordered by e- shops or it was not possible to inform suppliers about this issue all beneficiaries were asked to use the project stamp with code. The bills issued in the shops were stamped by project stamp with code.

8.3. Partnership arrangements (if relevant)

The first pre-payment was transferred at the very beginning of the project after the signature of partnership agreement to each AB. Next payment was sent on 11/11/2020 - after the approval of the Midterm report and after we as CB received the full instalment from EC. The last payment will be transferred after approval of the Final report and reception of the second instalment from EC, provided that all costs are duly financially documented and supported by all necessary documents. Each AB has assigned one person which is responsible for preparation of financial documents. Each individual statement for each AB was prepared by the assigned person, then it was sent to CB for control. After all mistakes were corrected, the project manager prepared a consolidated cost statement.

8.4. Certificate on the financial statement

The approved auditor for the project DELIVER was chosen in the process of public procurement. The company DOMINANT AUDIT s.r.o is established J.Zemana 99, 91101 Trenčín, SVK, represented for the signature of this report by Dipl. Ing. Jana Tomšíková, CA, responsible auditor, licensed SKAU 319. The auditor's report is in accordance with the Grant Agreement for the period covering from 15.06.2018 - 15.12.2023 for the amount 2 460 765,06 EUR. The signed Certificate on the financial statement is available in the Annex F.1._30.

8.5. Estimation of person-days used per action

Action type	Budgeted person-days	Estimated % of person-days spent
All projects when applicable Action A: Preparatory actions	205	76%
NAT and CLIMA projects Action B: Purchase/lease of land and/or compensation payment for payment rights		
ENV projects Action B: Implementation actions		
GIE projects Action B: Core actions		
NAT projects		

Action C – Concrete conservation actions		
CLIMA projects Action C: Implementation actions	4114	141%
ENV and GIE projects Action C: Monitoring of the impact of the project action		
NAT and CLIMA projects Action D: Monitoring and impact assessment	229	132%
ENV and GIE projects Action D: Public awareness/Communication and dissemination of results		
NAT and CLIMA projects Action E: Communication and Dissemination of results	747	95%
ENV and GIE projects Action E: Project management		
NAT and CLIMA projects Action F: Project management (and progress)	1993	88%
TOTAL	**7288**	

1) Mun BA-KV: Activities "C": 398 hours planned /832 hrs worked. During the implementation of the project, it became apparent that these C - implementation activities were much more time-consuming and capacity-demanding in reality than was anticipated when writing the project proposal. Our core activities were precisely the implementation activities, which required a larger volume of work. The planned amount of hours for communication activities was not fully utilised (planned 389 hours / 131,4 worked) but transferred for implementation activities.

2) BROZ: Activities "A": 45 number of person-days = nP-D planned/51 nP-D worked. The planning of activities took more time than planned, because we also involved pupils from ZSAD school in the process through interactive presentations and during the project we were forced to look for ways to implement measures to make them more resistant to destruction.

Activities "C": 847 nP-D planned/1559 nP-D worked. The originally planned nP-D was almost doubled for several reasons. This disproportion concern mainly C.6 activities: 755 nP-D planned/1446 nP-D worked. The most significant reason for the exceedance is the repeated repairing of implemented measures in the area of ZASD. The most common were fencing,

installation of information tables and shelters for reptiles. The second reason is the fact that some activities that were originally supposed to be performed by an external service, we implemented ourselves in the form of workshops - installation of vertical green wall, installation of mechanical protection of planted trees, bushes and plants and installation of notice boards for the educational trail. Another reason is the implementation of unplanned activities, which were necessary for the successful implementation of other goals, such as planting plants in the ZSAD. Another reason is the implementation of unplanned activities like as the construction of the gazebo, the reconstruction of the roofs of the shelters, creation of green roofs that were necessary for the successful implementation of other goals, for example planting plants. Caring for all the planted beds was also time-consuming, so a gardener was hired. A smaller exceedance was at C.7: 80 nP-D planned/101 nP-D worked. The preparation of extensive texts with photos on info panels took more time than planned. An unplanned activity within activity C.7 was the search for a suitable cleaner to clean noticeboard from spray and marker scribbles and repeated cleaning.

Activities “D”: 199 nP-D planned /284 nP-D worked. The nP-D were exceeded due to more extensive biota monitoring than was originally planned. Two monitoring reports were originally planned - one at the beginning of the project - before the measures implementation and one at the end of project - after all measures will be realised. However botanical and entomological monitoring was carried out annually based on the recommendation of experts. The longer these monitorings take place, the more informative the results are. Especially for insects. Reports from monitoring were submitted annually. Animal monitoring was provided by the BROZ project team during activities in the field, in addition to the expert biologist.

Activities “E”: 98 nP-D planned/199,75 nP-D worked. The highest nP-D exceedance (about 215 %) was achieved in E activities in the position of coordinator and field technician too. It is in direct accordance with the time needed to prepare and organize a large number of workshops, presentations and events with volunteers. Several "repair" workshops were also held for the purpose of repairing measures. We organized more events for a larger number of participants than planned. All together more than 90 events for more than 2530 participants. Dissemination of information about project activities and intentions was an important aspect for us. These did not take place only during the covid pandemic.

3) CDI (KRI - Climate and Development Institute)

Activities “C”: 93 hours over the budget: C.1: 2320 hrs planned /1542,5 hrs worked, **C.2.:** 2080 hrs planned /1626,5 hrs worked, **C.7.:** (2080 hrs planned /614,5 hrs worked, **C.8.:** (0 hrs planned / 2789,5 hrs worked), C1, C2 - The planned amount of hours was not fully utilised for this activity.

The amount of 2080 hours originally scheduled for **C.7** was mistakenly placed in the project proposal under C.7 activity where CDI didn't have a significant role, instead of the C8 activity that was fully in CDI´s responsibility.

Majority of the C.7 hours was spent working on C.8 activities and delivering outputs. Originally the planned number was exceeded due to extensive analysis of the legislative framework and related strategic documents – the original material (Review of the current Slovak legislative) delivered 04/2021 was expanded (analysis) and updated (legislative changes and new strategic documents) by 12/2022.

Within C7 activity CDI cooperated in preparation of educational activities – delivering an introduction seminar to the KLIMASKEN tool for local governance.

Activities "E": 93 hours under the budget, E.1.: 800 hrs planned /947 hrs worked, E.2.: 240 hrs planned /0 hrs worked). The planned number of hours was not fully utilised for these activities. CDI was active in the area of dissemination mainly within the E1 activity focus where we utilised the excess of E2 hours.

Activity F.1.: 320 hrs planned/320 hrs worked - the planned number was exceeded due to

4) iEPD - Activities "E": 240 hours planned / 896 hrs worked. The planned hours in budget were underestimated, we realised more E activities (seminars, brochure, lecture for final conference). We used part of the budget saved from activity C for activity E. (described in 8.B).

5) Ci2 - Activities "C": 7350 hours planned / 11514 hrs worked. After the start of the project, during a more detailed examination of the best available solutions, detailed research and the setting of the most appropriate basic framework for C1 and C2 activities, the need for a significantly higher time requirement for the preparation of a robust solution and implementation began to emerge.

   In particular, it turned out that activity C1, i.e. the development and testing of a comprehensive tool for assessing the city's climate resilience, which is scalable to the diverse conditions of cities of different sizes (and buildings of different types), will require significantly more time than the assumption in the proposal.

   This is connected also with "E" activities (E.1.: 750 hrs planned / 1042 hrs worked), because the scope of communication with city governments, operators of data sources, as well as owners and managers of buildings corresponded to the complexity and scope of inputs that had to be verified and standardised during the development of the Klimasken tool.

   Activity F.1.: 300 hrs planned / 315 hrs worked - the planned number of hours was slightly exceeded, which is related to personnel changes in the expert team during the implementation of the project.

List of all DELIVERABLES and MILESTONES with short description is available in Annex F.1._34..

LIST OF DELIVERABLE ANNEXES:

Annex no.	Description	Deliverable no.
A.1.1._1	Technical project (blueprint) for ZSAD	Deliverable no.3
A.1.1._2	Content of the technical project (blueprint) for ZSAD in English	Deliverable no.3
A.1.4._1	Completed project documentation for the kindergarten (MSK)	Deliverable no.34 suppl.
A.1.4._2	Content of the technical project (blueprint) for MS Koliskova in English	Deliverable no.34 suppl.
A.2.2._1	Technical project (blueprint) for public space 1 - square Jurigovo nám.	Deliverable no.5_1
A.2.2._2	Technical project (blueprint) for public space 2 - Park Kaskády	Deliverable no.5_2
C.1.2._1	Climate Resilient Low Carbon Factor Assessment tool - CReLoCaF (KLIMASKEN) including methodology and description	Deliverable no.8
C.1.3._1	Software application of CReLoCaF (KLIMASKEN), usable on computers through web interface	Deliverable no.10
C.1.6._1	Benchmarking results of the tier 6 pilot areas	Deliverable no.15A
C.1.6._2	Benchmarking results of the tier 6 pilot areas - summary in English	Deliverable no.15B
C.2.2._1	Vulnerability assessment of the BA-KV	Deliverable no.4
C.2.3._1	Catalogue of possible adaptation and mitigation measures in different key sectors - in English	Deliverable no.7
C.2.3._2	Catalogue of possible adaptation and mitigation measures in different key sectors - in Slovak	Deliverable no.7

C.2.4._1	Climate Resilient Low Carbon Action Plan	Deliverable no.13
C.2.4._2	Climate Resilient Low Carbon Action Plan - summary in English	Deliverable no.13
C.2.4._4	Proposal of new standards and regulative for urban land-use planning	Deliverable no.26
C.2.4._5	CRELOCAP evaluation report (update February 2023)	Deliverable no.25
C.3.2._1	Photo documentation of the measures in ZSAD	Deliverable no.31
C.3.2._1b	Photo documentation of the measures in ZSAD- google maps	Deliverable no.31
C.3.2._2	Photo documentation of the measures in MSK	Deliverable no.19
C.3.2._2b	Photo documentation of the measures in MSK - google maps	Deliverable no.19
C.4.1._1	Report from the survey of the existing state of residential buildings in the Mun_BA-KV (including English summary)	Deliverable no. 2
C.4.2._2	Architectural study - apartment building Karloveska 57	Deliverable no. 6
C.4.2._3	Architectural study - apartment building Karloveska 58-English summary	Deliverable no. 6
C.4.3._1	Quantification of energy potential savings for the residential housing stock in Bratislava Karlova Ves Municipality	Deliverable no. 14
C.4.3._2	Quantification of energy potential savings for the residential housing stock in Bratislava Karlova Ves Municipality (English summary)	Deliverable no. 14
C.5.1._1	Revitalization of the alternative open space - Park Kaskady	Deliverable no. 18
C.7.1._7	Leaflet to educational trail - English	Deliverable no. 24
C.7.1._8	Leaflet to educational trail - Slovak	Deliverable no. 24
C.7.5._7	KVC (CoCliBEC)opened - extrierior and interior - photodocumentation	Deliverable no. 20

C.8.2._1	Analysis based on legal and regulatory national framework, experiences from pilot demonstration measures preparation and implementation in BA-KV	Deliverable no. 21
C.8.4._1	The standards for sustainable rainwater management	Deliverable no. 23
D.1._1	Professional botanical study from the monitoring of the premises of ZSAD and MSK	Deliverable no. 12a
D.1._2	Botanical monitoring report 2019	Deliverable no. 12b
D.1._3	Summary (in English) of botanical monitoring study	Deliverable no. 12c
D.1._4	Pre-implementation entomological monitoring of grassy areas in the premises of ZSAD and MSK	Deliverable no. 12d
D.1._6	Monitoring entomological 2019	Deliverable no. 12e
D.1._7	Summary monitoring entomology 2019 (summary in English)	Deliverable no. 12f
D.1._8	Monitoring of the selected animal species occurence in the residential area Dlhe diely	Deliverable no. 12g
D.1._9	Monitoring of animals 2018 - final report	Deliverable no. 12h
D.1._11	Final monitoring report	Deliverable no. 27
D.1._12	Report about the climate conditions (temperature, humidity) before and after realization of measures	Deliverable no. 32
D.1._13	Botanical monitoring report 2020	Deliverable no. 12i
D.1._14	Entomological monitoring report 2020	Deliverable no. 12j
D.1._15	Botanical monitoring report 2021	Deliverable no. 12k
D.1._16	Entomological monitoring report 2021	Deliverable no. 12l
D.1._17	Botanical monitoring report 2022	Deliverable no. 12m

D.1._18	Entomological monitoring report 2022	Deliverable no. 12n
D.2._7	Final monitoring report - Report on the evaluation of the questionnaire survey including the Report from the final survey of non-materials benefits of the project	Deliverable no.28
E.1.1._1	Project web page https://odolnesidliska.sk/	Deliverable no.1
E.1.3._1a	Layman's report_ENG	Deliverable no.30
E.1.3._1b	Layman's report_SK	Deliverable no.30
E.1.11_1	Online guide for online tool KLIMASKEN - https://www.klimasken.sk/	Deliverable no.11
E.1.12._4	Catalogue of possible adaptation and mitigation measures - in Slovak language	Deliverable no.9
E.1.12._5	Catalogue of possible adaptation and mitigation measures - in English language	Deliverable no.9
E.1.13._1a	Brochure:Climate resistant development: innovative solutions and measures in public spaces and buildings_SK	Deliverable no.29
E.1.13._1b	Brochure:Climate resistant development: innovative solutions and measures in public spaces and buildings_ENG	Deliverable no.29
E.2.9._3	Information and dissemination materials - pens and stickers	Deliverable no.16
E.2.9._3a	Information and dissemination materials - pens with new project logo	Deliverable no.16
E.2.9._3b	Information and dissemination materials - canvas bags with new project logo	Deliverable no.16
E.2.9._3c	Information and dissemination materials - stickers with endangered species of animals	Deliverable no.17
E.2.9._4a	Leaflet about the biodiversity enhancement measures in the residential urban areas_SK	Deliverable no.22
E.2.9._4b	Leaflet about the biodiversity enhancement measures in the residential urban areas_ENG	Deliverable no.22
F.2._1	After LIFE plan DELIVER in Slovak	Deliverable no.33

F.2._2	After LIFE plan DELIVER in English	Deliverable no.33

LIST OF OTHER ANNEXES:

Annex no.	Description
A.1.1._3	Call for public procurement for the ZSAD technical project (blueprint)
A.1.1._4	Contract with the ZSAD technical project (blueprint) supplier
A.1.2._1	Leagally valid building permit for the kindergarten (MSK) by Construction Office
A.1.2._2	Leagally valid building permit for the primary school (ZSAD) by Construction Office
A.1.3._1	A record from a market survey for a public procurement implementer for a contractor for the reconstruction of kindergarten (MSK) and primary school (ZSAD) buildings
A.1.3._2	Contract with the winning company for the implementation of public procurement for the contractor of the reconstruction of the kindergarten (MSK) building
A.1.3._3	Contract with the winning company for the implementation of public procurement for the contractor of the reconstruction of the primary school (ZSAD) building
A.1.3._4	List with Contracts for contractor of the reconstruction of the kindergarten (MSK) building (including links to the website's official publication of the contracts to download)
A.1.3._5	Contract for the contractor of the reconstruction of the the primary school (ZSAD) building (including links to the website's official publication of the contracts to download)
A.1.3._6	Public Procurement Announcement for the Provision of Kindergarden Koliskova Building Reconstruction

A.1.3._7	Tender Evaluation Result for Kindergarden Koliskova Reconstruction
A.1.3._8	Public Procurement Announcement for the Provision of ZSAD Building Reconstruction:
A.1.3._9	Tender Evaluation Result for ZSAD Reconstruction
A.2.1._1	Principles and criteria for the renovation of public spaces
A.2.1._2	Public procurement for the participatory process
A.2.1._3	Contract with the winner of the public procurement for the participatory process
A.2.1._4	Questionnaire regarding the square Jurigovo nám.
A.2.1._5	Photos urban walk 28 May 2019 - the square Jurigovo nám.
A.2.1._6	Photos workshop 27 June 2019 - the square Jurigovo nám. participatory process
A.2.1._7	Report from public participation on preparation of the square Jurigovo nám. renovation
A.2.1._8	Report from public participation on preparation of the square Jurigovo nám. renovation - summary in English
A.2.1._9	3rd meeting with inhabitants re. the square Jurigovo nám. - minutes
A.2.1._10	Presentation - meeting with inhabitants, rainwater retention measures Park Kaskády
A.2.2._3	Public procurement for technical project (blueprint) of the public space 1 - square Jurigovo nám.
A.2.2._4	Contract with the winner of the public procurement for technical project (blueprint) of the public space 1 - square Jurigovo nám.

A.2.2._5	Public procurement for technical project (blueprint) of the public space 1 - Park Kaskády
A.2.2._6	Contract with the winner of the public procurement for technical project (blueprint) of the public space 1 - Park Kaskády
A.2.3._1	Notification of minor construction and maintenance work to Building Office
A.2.3._2	Approval to place the underground rainwater collection tanks by BCCO
A.2.3._3	Statement by Bratislava District Office, the Department of Environmental Care, the Department of Nature Protection and selected environmental components
C.1.1._1	Overview of approaches to assessment of climate change mitigation and resilience of the urban environment- desk study with English summary
C.1.3._2	Public procurement for CRELOCAF (KLIMASKEN) programmer
C.1.3._3	Contract with the winner of the public procurement for CRELOCAF (KLIMASKEN) programmer
C.1.4._1	Memorandum of common intend, KLIMASKEN testing - city of Hlohovec
C.1.4._2	Memorandum of common intend, KLIMASKEN testing - city of Presov
C.1.4._3	Committment to provide synergies in KLIMASKEN testing - city of Košice
C.1.4._4	Memorandum of common intend, KLIMASKEN testing - city of Prague
C.1.4._5	Memorandum of common intend, KLIMASKEN testing - city of Holice
C.1.4._6	Memorandum of common intend, KLIMASKEN testing - city of Třebíč

C.1.4._7	Memorandum of common intend, KLIMASKEN testing - Homolka-Motol Neighborhood Association
C.1.4._8	Examples of replication - KLIMASKEN - CZ, SK - presentation during the Final Conference
C.1.4._9	Details of action C.1.5. Replication of CreLoCaF (KLIMASKEN) in the tier cities - SK, CZ
C.2.1._1	Founding members of MUWOG group and the gorup´s tasks
C.2.1._2	Invitation to MUWOG meeting no.1 - 29.11.2018
C.2.1._3	Attendance list - MUWOG meeting no.1
C.2.1._4	Invitation to MUWOG meeting no.2 -05.03.2019
C.2.1._5	Attendance list MUWOG meeting no.2
C.2.1._6	Members of MUWOG group (update 2023)
C.2.2._2	Background study of watercourses
C.2.2._3	Background study of watercourses - with English translation of the Conclusion
C.2.2._4	Study on climatological scenarios (SHMU)
C.2.2._5	Study on climatological scenarios - English translation of the most important parts
C.2.2._6	The Study of the temperature modelling in relation to the heat island based in the urban structure of the Bratislava Municipality Karlova Ves
C.2.4._3	Approval of the Action Plan by the Municipal Council on 16 June 2020
C.3.2._3	Evaluation of Operating Costs and Experiences after Deep Renovation of MSK Building

C.3.2._4	Evaluation of Operating Costs and Experiences after Deep Renovation of ZSAD Building
C.3.2._5	Energy Certificate after deep renovation of ZSAD
C.3.2._6	Energy Certificate after deep renovation of MSK
C.3.2._7	Photos: The demonstration wall with several types of nesting boxes for birds and bats (office BROZ)
C.3.2._8	Details about activity C.3.1. - Realisation of deep renovation work on the demonstration building ZSAD (including Annexes)
C.3.2._9	Details about activity C.3.2. Realisation of deep renovation work on the demonstration building MSK ((including Annexes)
C.4.2._1	Calculations of energy and CO2 - PHPP calculations potential analyses of both buildings
C.4.2._4	Attendance list-meeting with residents of selected apartment building, April 1, 2018
C.4.2._5	Attendance list-meeting for C4 activity, February 10, 2020
C.4.2._6	Meeting with tenants of Pribisova - photo 1
C.4.2._7	Meeting with tenants of Pribisova - photo 2
C.4.2._8	Meeting with tenants of Pribisova - photo 3
C.4.2._9	Attendance list-Slovak Chamber of Architects, January 9, 2019
C.4.2._10	Multidisciplinary team - photo 1
C.4.2._11	Multidisciplinary team - photo 2
C.4.2._12	List of interested residents, involved in the participatory planning process of the renovation of residential buildings

C.4.2._13	Details about activity C.4.2. Energy optimisation, solutions proposal for two residential building to reach the “near zero energy building” standard (including Annexes)
C.5.1._2	Post evaluation’ study report - Park Kaskády
C.5.1._3	List of shading sales in Bratislava-Karlova Ves Municipality
C.5.1._4	List of retention rainwater tanks in Bratislava-Karlova Ves Municipality
C.5.1._5	Details about activity C.5.1. Realisation of mitigation and adaptation measures with regards on biodiversity (including Annexes)
C.6._1	The actual design of biodiversity measures in Majernikova
C.6._2	Photos: Vandalism in the area at ZSAD
C.6._3	Photos of placed dead wood
C.6._3a	Photos: reconstrucion of an insect hotel an d a creation of a new one
C.6._3b	Photos: creation of an insect hotels
C.6._3c	Photos: creation of small insect hotels
C.6._4a	Photos: wintering places for hedgehogs
C.6._5a	Photos: hiding place for reptiles
C.6._5b	Photos: hiding place for reptiles and repeated repairs of it
C.6._6a	Photos: Installation of feeding and nesting boxes
C.6._6b	Photos: nesting boxes from March, 2022
C.6._6c	Photos: cleaning the nesting boxes and resident bird

C.6._7a	Photos: flowering grasslands and flower beds
C.6._7b	Map: fenced areas
C.6._7c	Excel table: fenced areas only
C.6._7d	Map: areas with reduced grass cutting
C.6._7e	Excel table: uncut grass areas total
C.6._7f	Photos: meadow flowers
C.6._7g	Photos: planting herbs in the fruit and herb garden
C.6._7h	Photos: gazebo, container and roofs of shelters
C.6._7i	The official letter to MUN-BA-KV from BROZ
C.6._8a	Photos: Temporary drinking places for hedgehogs
C.6._8b	Photos: Stabile drinking places for birds, insects and other animals
C.6._8c	Photos: Stabile drinking place for animals
C.6._9a	Photos: planting of bushes and trees in the area at ZSAD
C.6._9b	Map of trees and bushes ZSAD
C.6._9c	Photos: 9 Liquidambar styraciflua trees planted - Karloveská
C.6._9d	Photos: trees and shrubes planted - Hlavacikova, Majernikova
C.6._9e	Photos: Shrubs planted with volunteers - Hlavacikova, Majernikova, community garden Zive zrnko
C.6._9f	Photos: Problems with planted trees

C.6._10a	Photos: Native trees planting
C.6._10b	Photos: Protection of self-growing trees - natural rejuvenation
C.6._11	Impermeable concrete areas changed to permeable 100 m2 MŠ Kolískova area
C.6._12a	Climate ponds MS Koliskova
C.6._12b	Climate ponds Kaskady park
C.6._13	4 apiaries installed in the Community Garden on Janotova Street
C.6._14a	The demonstration green vertical wall
C.6._14b	Photos: climbning plants (actinidia, lonicera)
C.6._15	List of all actions to support biodiverzity implemented by BROZ
C.6._16	Details about activity - C.6 Implementation of demonstration adaptation measures on public buildings and public spaces for enhancement of biodiversity resilience within the cities - including Annexes
C.6._17	Replications of BROZ C.6. activities - biodiversity support
C.7.1._1	Basic project plan for CoCliBEC - Community Education Centre for Climate and Biodiverzity (KVC)
C.7.1._2	The Operating Regulations for Community Education Centre for Climate and Biodiverzity (KVC)
C.7.1._3	Photos from the Community Education Centre for Climate and Biodiverzity (KVC) - presentation room
C.7.1._4	Photos from the Community Education Centre for Climate and Biodiverzity (KVC) - atrium exhibition of the interactive models
C.7.1._5	Photos from the Community Education Centre for Climate and Biodiverzity (KVC) - information board

C.7.1._6	Webpage - section for the Community Education Centre for Climate and Biodiverzity (KVC)
C.7.2._1	Participants on counseling center (42 counselling events with 266 participants)
C.7.2._2	Participants of workshops, lectures and presentations (in total)
C.7.2._3	Visitors' book - Community Education Center for Climate and Biodiversity - KVC (CoCliBEC)
C.7.2._4	Invitation and programme of the professional seminar on online tool KLIMASKEN in Bratislava
C.7.2._5	Attendance sheet - professional seminar on online tool KLIMASKEN in Bratislava
C.7.2._6	Photos - professional seminar on online tool KLIMASKEN in Bratislava
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C.7.2._8	Presentation 1 - professional seminar on online tool KLIMASKEN in Bratislava
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