



Co-funded by
the European Union

smartWB

Report on climate-friendly and innovative solutions in urban development

This project has been funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Climate-friendly and innovative solutions in the context of urban development:
current and future challenges

Project: 101081724 — SmartWB — ERASMUS-EDU-2022-CBHE

PROJECT INFO

Project title	Curricula innovation in climate-smart urban development based on green and energy efficiency with the non-academic sector
Project acronym	SmartWB
Project reference number	101081724
Funding scheme	Lump sum grant - ERASMUS-EDU-2022-CBHE
Web address	www.smartwb.ucg.ac.me
Coordination institution	University of Montenegro
Project duration	36 months

DOCUMENT CONTROL SHEET

Work package	WP2 Analysis of current status in climate-smart urban development
Ref. no and title of activity	T2.4 Workshop on climate-friendly and innovative solutions: current and future challenges
Title of deliverable	Report on climate-friendly and innovative solutions in urban development
Lead institution	University of Natural Resources and Life Sciences, Austria (BOKU)
Author(s)	Florian Reinwald, Michael Tritthart, Doris Damyanovic, Karin Weber, Julian Binder, Martin Oldenburg, Anna Mues, Genti Qirjazi, Merima Sahinagic
Document status	Final version
Document version and date	V.03, 16 June 2023
Dissemination level	Project partners

VERSIONING AND CONTRIBUTION HISTORY

Version	Date	Revision description	Partner responsible
V.01	09 May 2023		BOKU
V.02	23 May 2023		BOKU
V.03	17 June 2023		BOKU

Content

1	Introduction.....	6
2	Consolidation report of task 2.1.....	7
2.1	Introduction and objectives of task 2.1.....	7
2.2	Results of the comparative analysis.....	8
2.2.1	Social cohesion.....	8
2.2.2	National plans in WB region.....	9
2.2.3	Reducing car dependency.....	9
2.2.4	Preservation of the environment and resources.....	10
2.2.5	Urban planning and land management.....	10
2.2.6	Urban planning and regulations.....	11
2.2.7	Sustainable urban planning.....	12
2.3	Issues in urban development – national perspective.....	13
2.3.1	Montenegro.....	13
2.3.2	Bosnia and Herzegovina.....	14
2.3.3	Albania.....	15
3	Consolidation report of task 2.2.....	17
3.1	Introduction and objectives of task 2.2.....	17
3.2	Results of task 2.2.....	17
3.2.1	EU initiatives and policies related to urban development.....	18
3.2.2	National implementation in the EU Member States (+ Norway and Serbia).....	19
3.2.3	Best practices from EU Member States (+ Norway and Serbia).....	22
3.2.4	Networks and cooperation.....	23
3.3	Conclusion.....	23
4	Consolidation report of task 2.3.....	24
4.1	Introduction.....	24
4.2	Overview of typology.....	24
4.3	Collecting curricula from all partners.....	25
4.4	Methodology of grouping curricula and courses.....	26
4.5	List of groups with respective typology courses.....	27
4.6	Comparing curricula between groups.....	27
4.7	Summary and conclusions on improvement of the existing courses and the development of new courses.....	30

5	Summary of task 2.4 – Workshop in Vienna	32
5.1	Agenda and objectives	32
5.2	SWOT analysis for key issues in Montenegro	33
5.2.1	Reducing car dependency	33
5.2.2	Improving waste management	34
5.2.3	Improve the energy efficiency of new and existing buildings.....	34
5.2.4	Improving irrational and inefficient use of water	34
5.3	SWOT analysis for key issues in Albania.....	35
5.3.1	Improving spatial planning policies (energy and climate plan).....	35
5.3.2	Sustainable urban development through a sustainable mobility plan	35
5.3.3	Protection of the environment and resources.....	36
5.3.4	Informal settlements.....	36
5.4	SWOT analysis for key issues in Bosnia and Herzegovina	36
5.4.1	National plans in Bosnia and Herzegovina	36
5.4.2	Reducing car dependency	37
5.4.3	Waste management	37
5.4.4	Water management	37
6	Conclusions and outlook	39

List of abbreviations

- BAT Best Available Techniques
- B&H Bosnia and Herzegovina
- BSc. Bachelor of Science
- CSUD Climate Smart Urban Development
- ECTS European Credit Transfer System
- FNC Fourth National Communication (of the UNFCCC)
- GLPT General Local Territory Plans
- GHG Greenhouse gas
- HEI Higher Education Institutions
- INDC Intended Nationally Determined Contribution of Montenegro
- INSTAT Institute of Statistics Albania
- MSc. Master of Science
- MOFTER Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina
- NAP National Adaption Plans
- NDC National Determined Contributions
- NSSD National Sustainable Development Strategy
- SDG Sustainable Development Goals
- SWOT Strengths, Weaknesses, Opportunities, Threats
- UNESCO United Nations Educational, Scientific and Cultural Organization
- UNFCCC United Nations Framework Convention on Climate Change
- URP Urban Regulatory Plan
- WB Western Balkan
- WP Working Package

Executive Summary

Climate-smart urban development (CSUD) plays a crucial role in the European Union and has to be prioritized in the member states regarding both the legislative framework and the implementation of concrete measures. Therefore, countries which want to join the EU need to show their focus on CSUD by formulating specific planning policies according to EU law and realizing innovative measures.

The SmartWB project, which is funded by the EU, focuses on three Western Balkan (WB) countries, namely Montenegro, Bosnia and Herzegovina and Albania regarding their current conditions in CSUD with the objective to identify existing CSUD projects, but also deriving CSUD measures which still need to be realized. A crucial responsibility in increasing the knowledge and expertise in CSUD in the WB countries is carried by the universities in the region. Therefore, work package (WP) 2 of the SmartWB project also includes an analysis of existing curricula related to CSUD both in the EU Member States and in the three WB countries with the goal of identifying gaps in the courses taught.

This report covers on the one hand the consolidation of the reports 2.1 – 2.3 and on the other hand the workshop on climate-friendly and innovative solutions: current and future challenges, which was held in Vienna from May 31st to June 2nd 2023. Report 2.1 focuses on Western Balkan regional issues related to urban development. Report 2.2 provides an overview of EU initiatives and policies related to urban development and climate change. Report 2.3 deals with the analysis of existing curricula related to CSUD both in EU Member States and Montenegro, Bosnia and Herzegovina and Albania. Eventually, the workshop helped to discuss the different topics together with all persons who are included in the project. At its core, strengths, weaknesses, opportunities and threats (SWOT) of regional issues regarding CSUD could be identified and key strategies in CSUD for the three WB countries were derived.

1 Introduction

This report on climate-friendly and innovative solutions in urban development is part of work package (WP) 2 of the SmartWB project, which is funded by the European Union. The content of the report is structured as follows:

- Consolidation report of task 2.1 – Western Balkan (WB) regional issues related to urban development
- Consolidation report of task 2.2 – EU initiatives and policies related to urban development and climate change
- Consolidation report of task 2.3 – Analysis of existing curricula related to CSUD in EU Member States and third countries not associated to the programme
- Summary of task 2.4 – Workshop on climate-friendly and innovative solutions: current and future challenges

The objectives of the report are to summarize the reports 2.1 – 2.3 for a quick overview of the whole work package, as well as the résumé of the workshop, which was held in Vienna from May 31st to June 2nd 2023 describing the methods used and the findings obtained, which will help proceeding to work on WP3.

The western Balkan (WB) countries which the focus is set on, are Montenegro, Bosnia and Herzegovina as well as Albania. All these three countries want to become EU Member States. In order to achieve this goal, the current policies on the topic of climate smart urban development (CSUD) need to be prioritized. Therefore, report 2.1 first identifies the regional issues related to CSUD in the WB countries. Report 2.2. then describes EU initiatives and policies related to CSUD including the national implementation in several EU Member States (+ Norway and Serbia). Additionally, best practice examples on realised CSUD measures are highlighted. Report 2.3 focuses on identifying the gaps of CSUD university courses between EU Member States and the three WB countries. Eventually, the workshop served to find differences and synergies in CSUD between the three WB countries, which will support Montenegro, Bosnia and Herzegovina and Albania, respectively, in enhancing their climate-smart urban development policies.

2 Consolidation report of task 2.1

This report focuses on Western Balkan (WB) regional issues related to urban development.

2.1 Introduction and objectives of task 2.1.

Cities are seen as both the source of and solution to today's economic, environmental and social challenges. As stated in the relevant policies and articles by the European Union, urban areas are the engines of the European economy and act as catalysts for creativity and innovation throughout the Union. However, they are also places where persistent problems, such as unemployment, segregation and poverty, are at their most severe. Urban policies therefore have wider cross-border significance, which is why urban development is central to the EU's Regional Policy.

The various dimensions of urban life – environmental, economic, social and cultural – are interwoven and success in urban development can only be achieved through an integrated approach. Measures concerning physical urban renewal must be combined with those promoting education, economic development, social inclusion and environmental protection. It also calls for strong partnerships between local citizens, civil society, industry and various levels of government.

Such an approach is especially important for western Balkan countries in general, but in this case for Montenegro, Bosnia and Herzegovina and Albania – countries that are trying to become EU members and provide adequate answers on the European Green Deal and other Commission priorities.

The focus of the report on WB regional issues related to urban development addressed issues directly related to inclusive urban development identified through the review of the following topics:

- 1) Social cohesion,
- 2) National plans in the WB region,
- 3) Reducing car dependency,
- 4) Preservation of the environment and resources,
- 5) Urban planning and land management,
- 6) Urban planning regulations, and
- 7) Sustainable urban planning.

The report gives a basic, initial overview of the regional issues related to urban development in the Western Balkan countries of Montenegro, Bosnia and Herzegovina and Albania. The report was developed based on literature, academic studies and research projects covering the wider economic and social environment in the WB region, including those published by national and European public institutions, UN, UNDP, various NGOs and international organizations.

Main objective of the task was to collect relevant information related to urban development that can be later used in preparing a platform for sharing knowledge among countries and academic institutions.

2.2 Results of the comparative analysis

2.2.1 Social cohesion

Montenegro:

In 2023, the Government of Montenegro established the Fund for the Accelerated Development of Montenegro. As a catalyst for accelerating the implementation of the UN Agenda 2030, the Fund aims to accelerate Montenegro's accession to the EU. It was designed to support strategic initiatives until 2027 in three priority areas.

The National Strategy for Sustainable Development of Montenegro by 2030 with the objective of creating a cohesive society in Montenegro should place economic growth and development as a basis, but also consider the increase of social trust, ensuring equal opportunities and high participation of citizens in all social processes, from making decisions to their monitoring and implementation.

The Human Development Report Montenegro (UNDP) provides a comprehensive overview of human development in Montenegro, including social cohesion and urban development issues. The report highlights the need for more significant investment in urban infrastructure, services, policies, and initiatives promoting social inclusion and community participation.

Bosnia and Herzegovina:

The National Human Development Report 2020 (NHDR): Social Inclusion in Bosnia and Herzegovina was produced by the United Nations Development Programme in Bosnia and Herzegovina with the support of the Embassy of Switzerland in Bosnia and Herzegovina aiming to assess and to trigger a debate on social inclusion in Bosnia and Herzegovina. The survey showed that social cohesion and connections, including ethnicity, have weakened over the past decade.

The report's review of social inclusion support mechanisms in Bosnia and Herzegovina reveals a set of fragmented political, administrative, and economic institutions and a social sector that, based on its current funding arrangements, cannot ensure the equitable provision of essential social goods and services for all. While most of those denied access to these rights are indistinguishable from their fellow citizens, persons with disabilities, members of disfavored minorities and those without social or economic resources were most at risk.

Albania:

The National Regional Development Strategy 2021-2027 (draft) sets the main framework of development in terms of economic, territorial, and social cohesion, intending to develop the human capital; create the conditions for sustainable growth; foster employment and wealth creation; and improve inter-institutional capacities.

Aside from this integrated strategy, Albania has implemented various sectorial policies to promote social cohesion and reduce inequality through education, employment, social welfare policies, support to marginalized groups, etc.

Promoting social cohesion in Albania requires a holistic approach that considers the interrelationships between urban planning, community engagement, and social services while also tackling the challenges of informal settlements, quality of education, access to affordable housing,

marginalized groups, etc. By addressing these factors, Albania can build more resilient, inclusive, and sustainable urban communities that enhance the quality of life for all residents.

2.2.2 National plans in WB region

Montenegro:

Montenegro is one of the first countries in Southeast Europe to establish a strategic and institutional framework for sustainable development by the standards of the developed countries of the European Union. The main document dealing with urban development is the National Sustainable Development Strategy until 2030, Ministry of Ecology, Spatial Planning and Urbanism. The strategy establishes a comprehensive framework for the national response to challenges on the way to the sustainable development of Montenegrin society until 2030.

Bosnia and Herzegovina:

Underway is the preparation of the Fourth National Communication of Bosnia and Herzegovina under the UNFCCC (FNC), the revised Climate Change Adaptation Strategy and the revised NDC that will include a chapter on climate change-induced losses and damages. These documents were used in preparing the initial draft of the Bosnia and Herzegovina National Adaptation Plan, while the final NAP document will be aligned with the aforementioned documents once they are adopted. The B&H National Adaptation Plan aims to improve existing reporting on the development and implementation of adaptation measures and flow of information and contribute to integrating climate change adaptation into relevant social, economic and environmental policies and actions.

Albania:

European integration is the geostrategic and political objective of Albania, which is at the core of its domestic and foreign policy. The National Sustainable Development Strategy for Albania (2030) provides a roadmap for achieving sustainable development in the country. The strategy is aligned with the United Nations Sustainable Development Goals (SDGs) and aims to promote economic, social, and environmental sustainability. It covers economic, social, and environmental dimensions of sustainability, governance, and institutional capacity.

2.2.3 Reducing car dependency

Montenegro:

In Montenegro, the transport sector has a share of 10% in the final energy consumption. Road transport accounts for almost 90% of energy consumption in the transport sector, with the dominant share of passenger cars. In 2020, Podgorica adopted its first Sustainable Urban Mobility Plan (SUMP).

Bosnia and Herzegovina:

In B&H, currently no significant programs or projects are focusing on reducing emissions in the transport sector. However, state and entity legislation regulating the fields of transport and environmental protection sets a framework for the import, purchase, registration and homologation of motor vehicles, fuel quality, and mandatory regular annual inspection of motor vehicles. In 2020,

Sarajevo Canton adopted the Plan for Sustainable Urban Mobility of the Sarajevo Canton and the City of Sarajevo.

Albania:

According to the Institute of Statistics of Albania, in 2021, the total number of vehicles in Albania was 740669. The latest INSTAT data in the Regional Statistical Yearbook show that Albania is the country in Europe that has the fewest vehicles in relation to the population. The data on the level of motorization show that in 2019 that the county had about 199 vehicles per 1000 inhabitants, compared to 520, which is the average of the European Union.

2.2.4 Preservation of the environment and resources

Montenegro:

Preserving the environment, space, and the rich resources Montenegro has at its disposal is a challenge that all segments of society should work on together. The basic legal issues in this area are regulated through six relevant laws. The Environmental Protection Agency of Montenegro is well established.

Bosnia and Herzegovina:

B&H is a decentralized country comprising two entities and Brčko District. They manage environmental issues through laws, regulations, and standards. The B&H Ministry of Foreign Trade and Economic Relations is responsible for coordinating activities and harmonizing plans of the entities' governmental bodies and institutions at the international level in energy, environmental protection, development, and the exploitation of natural resources.

Albania:

The status of the environment and its trends present a real obstacle for the accession of Albania into the EU in the future. Mitigating the environmental degradation left by the communist legacy and the one caused during the transition period proved to be hard and costly, with costs still showing up.

2.2.5 Urban planning and land management

Montenegro:

The Spatial Plan of Montenegro is a basic document for urban planning and land management. The goals for urban planning and land management are defined in the Law on Spatial Planning and Construction of Buildings. The General Regulation Plan of Montenegro is adopted for the northern, central, and coastal regions, as well as the area of national parks and the area under the protection of the UNESCO. The region's scope is determined per the law governing regional development, excluding areas of national parks and regions under UNESCO protection.

Bosnia and Herzegovina:

In the Constitution of B&H, the strategy of spatial arrangement and planning does not exist at the state level nor within the framework of the Council of Ministers. Consequently, such a significant issue and an even more significant framework for possible development are not legally regulated. The two entities and Brčko District are responsible for providing spatial planning. There is no state-level ministry of spatial planning. Each entity, independently, without mutual coordination, plans and carries out the most significant interventions. Planning, both development and implementation, is defined at the entity levels and the Brčko District level.

Albania:

In the case of Albania, it should be underlined that urban planning during the last 30 years has been dependent on the Reform of land distribution into private ownership (parcel based) and after the process of legalization of informal buildings. After this year, the Albanian government put as objective the establishment of urban planning as the main factor for developing the country and applying various infrastructural programs and projects for development.

2.2.6 Urban planning and regulations

Montenegro:

Urban planning regulations in Montenegro are primarily governed by the Law on Spatial Planning and Construction of Buildings, which was last amended in 2020. This Law regulates the spatial planning system, the manner and conditions of construction of buildings, the legalization of illegal buildings and other issues of importance for space planning and construction of buildings. The law regulates various aspects of spatial planning, including land use, urban development, and construction activities. There are also other relevant laws.

Bosnia and Herzegovina:

In the environmental sector in B&H, the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina (MOFTER) is responsible for coordinating activities and harmonizing entity plans at the international level, but the responsibility for environmental issues in B&H rests with the entity governments. The most important international agreement ratified in environmental protection is the United Nations Framework Convention on Climate Change (UNFCCC) (2000). The Kyoto Protocol was ratified in 2007. Due to the constitution of the state, urban planning is regulated on entity levels and through relevant entity laws.

Albania:

In 2006, the Law for Legalization of Illegal Settlements and Construction was passed by the Albanian Parliament to support the legalization process of informal developments. In 2014, the Albanian Parliament approved the law on: "For Planification and Developing of Territory", which was made operative by two Decision of the Council of Ministers. The main product which the law requires is the designing and compilation of General Local Territory Plans (GLPT).

Those documents were headed by the Law of Urbanity, which is the basic document for the activities for urbanistic offices in each municipality of Albania, and enables today designing the Urban Regulatory Plan (URP) at each level.

2.2.7 Sustainable urban planning

Montenegro:

In 2015, the Government of Montenegro adopted the National Sustainable Development Strategy (NSSD) until 2030. The NSSD considered national circumstances and obligations when defining strategic goals and measures for implementing the Sustainable Development Goals (SDG) and harmonizing sectoral policies with the SDG. To achieve sustainable territorial development and solve problems such as regionally uneven unplanned development and issues of the so-called "investor planning", which has become increasingly widespread in recent decades, Montenegro adopted the Law on Spatial Planning and Construction (2017). It was designed to transform the planning system, introducing order into urban and territorial development.

Achieving sustainable urban and territorial development in Montenegro is possible through planning compact and connected cities and regions and a planning system more aligned with decentralization.

Bosnia and Herzegovina:

The first step for the implementation of Agenda 2030 in Bosnia and Herzegovina was to develop the SDGs Framework in Bosnia and Herzegovina, as a joint document of governments at all levels, which has been produced in 2020. The document represents a broader framework to achieve Agenda 2030 and the SDGs and as such it will serve for steering the current and upcoming processes of strategic planning in Bosnia and Herzegovina, the Republic of Srpska, the Federation of Bosnia and Herzegovina and the Brčko District of Bosnia and Herzegovina. The Council for the implementation of the SDGs in Bosnia and Herzegovina is assigned to overall monitoring and reporting on the implementation of the SDGs Framework, coordination of the preparation of annual reports and voluntary reviews towards the United Nations. Under the sustainable development cooperation Framework Bosnia and Herzegovina and the UN have adopted a Declaration of commitment, committed to working together to achieve priorities in B&H.

Albania:

Sustainable urban planning is an important consideration in Albania, where rapid urbanization and economic growth have placed increasing pressure on natural resources, ecosystems, and social structures. The country has taken a number of steps to promote sustainable urban planning. In addition, Albania has committed to the United Nations' Sustainable Development Goals (SDGs), which include several targets related to sustainable planning and urban development. Overall, Albania's urban planning regulations recognize the importance of sustainable planning and have taken steps to incorporate sustainable practices into the planning and development process. Sustainable planning is being applied and considered across various sectors in Albania, with a particular focus on the urban development sector as the country works to address the challenges of urbanization and promote long-term sustainability in its cities and towns. The Territory Strategy document in Albania is a planning

document that provides a long-term vision for the sustainable development of Albania's territory and sets out the policies, strategies, and actions needed to achieve this vision.

2.3 Issues in urban development – national perspective

2.3.1 Montenegro

- Unsustainable patterns of management and consumption of renewable natural resources, mitigating or eliminating the negative effects of natural and anthropogenic hazards on the state of natural resources and reducing the impact of pollution on human health.
- Lack of awareness among the general public and decision-makers regarding sustainable urban development principles and practices.
- Insufficient use of non-renewable natural resources - space, metals, and non-metals; irrational and inefficient use of water; insufficient construction of infrastructure for wastewater treatment; inadequate control of numerous sources of pollution, inconsistent application of strategic and project impact assessment in exploitation planning, inadequate protection against flooding and erosion, non-application of the best available techniques (BAT), weaknesses in the information system, non-adoption of river basin management plans, etc.
- Effective use of resources and reduction of their consumption is needed in the context of introducing the concept of circular economy, as well as minimizing the impact of their exploitation, industrial processing.
- By the intended nationally determined contribution to the global reduction of greenhouse gas emissions (INDC), Montenegro's strategic goal in mitigating climate change is to reduce GHG emissions by 2030 by 30% compared to 1990.
- It is necessary to improve spatial urban planning, improve the quality of construction works and the use of sustainable construction products, raise standards in terms of energy efficiency and increase the use of energy from renewable sources in residential buildings, etc.
- It is necessary to stimulate a more resource-efficient use of construction materials and the production of the materials themselves, consider options for longer-term use and duration of construction materials: reduce the amount of waste from construction, enable the recycling of construction materials, which are primarily disposed in landfills. It is necessary to apply recommendations on the construction of buildings with minimal emissions, introduce energy-efficient design and construction, ensure the use of building materials and products that improve the energy characteristics of buildings, ensure appropriate maintenance of facilities, enable and encourage the reconstruction of existing buildings, ensure adequate infrastructure planning and ensure the use of ecological materials in construction.
- Montenegro is one of the most inefficient energy users in Europe - addressing climate-adapted building retrofits is particularly interesting, as Montenegro has many energy-inefficient facilities.

- Sustainable urban development must include strategies to reduce waste generation, promote recycling and reuse, and develop adequate waste management infrastructure.
- Montenegro highly depends on automobiles, contributing to air pollution, congestion, and carbon emissions. Sustainable urban development must promote the use of public transportation, biking, and walking, as well as the development of sustainable transportation infrastructure.

2.3.2 Bosnia and Herzegovina

- Due to the complex administrative and political structure of Bosnia and Herzegovina, spatial planning, land management, energy use, air pollution and all other nationally important issues have been reduced to the entity level. This leads to insufficient systems of control, monitoring, and huge administration efforts with very slow communication.
- The political climate in the country is still occupied by numerous other issues, ignoring the fact that natural resources are a national asset that needs to be uniquely managed.
- Major issued is the fact that in the constitution of B&H, the strategy of spatial arrangement and planning does not exist at the state level, nor within the framework of the council of Ministers. The consequence of this is the fact that such a significant issue and an even more significant framework for possible development is not legally regulated. The responsibility for the provision of spatial planning is delegated to the two entities and Brčko District. There is no state level ministry of spatial planning. Each entity independently, without mutual coordination, plans and carries out the most significant interventions in the area.
- The absence of any administrative form of spatial management and the lack of a state spatial planning strategy impedes the realization of correct regional development and a polycentric system of development with cities-centers of regions that will be generators of overall development.
- There are unsustainable patterns of management and consumption of renewable natural resources, mitigating or eliminating the negative effects of natural and anthropogenic hazards on the state of natural resources and reducing the impact of pollution on human health.
- The current legislative framework in Bosnia and Herzegovina does not provide a sufficient basis to adequately address climate change impacts, which further compounds the process of adapting to changing climate. Under the constitution of Bosnia and Herzegovina, legislative competences in the field of environment belong to the entities in B&H (Republic of Srpska and the Federation of Bosnia and Herzegovina) and the Brčko District of B&H. Analysis of the entire legislative framework in B&H shows that all primary and secondary legislation in the country addresses this problem within the broad concept of 'climate', which is certainly insufficient.
- Lack of financial resources for efficient using of non-renewable natural resources - space, metals, and non-metals; efficient water management including cleaning, wastewater treatment, protection against flooding and erosion, etc; adequate actions to start solving the issue of waste and landfills correctly, as well as the disposal of toxic substances.

- Insufficient promotion of and laws for the implementation of appropriate principles and steps of a circular economy, which would increase the need for specialized knowledge.
- Lack of stimulation of a more resource-efficient use of construction materials and the production of the materials themselves, consideration of options for longer-term use and duration of construction materials: reduction of the amount of waste from construction, enabling the recycling of construction materials, which are primarily disposed of in landfills.
- Lack of stimulation and impositions through legal obligation of regular buildings maintenance, retrofit and energy efficiency buildings upgrade, proper planning documentation, etc.
- Absence of spatial planning documentation and spatial planning strategies at the state level.
- Lack of sustainable planning in local communities (with the exception of the Sarajevo Canton) in all areas (transportation, urban greenery, land use, etc.).

2.3.3 Albania

- Albania faces several challenges with its urban planning regulations that require comprehensive and coordinated efforts by the government, civil society, and private sector. Therefore, the recent reform in urban planning regulations in Albania aims to provide a more effective and integrated approach to urban development by promoting sustainable growth and protecting the environment while also improving the quality of life for citizens.
- Although there are regulations in place, the enforcement of these regulations can be weak due to limited resources, corruption, and political influence. This can lead to a lack of accountability and uneven application of the law, which can undermine the effectiveness of urban planning regulations.
- Albania faces challenges in providing adequate infrastructure and services to support urban development, such as water supply, waste management, and transportation. This can make it difficult to attract investment and encourage sustainable development.
- While the law requires public participation in the urban planning process, in practice, this can be limited, and the public can feel excluded from decision-making processes. This can lead to a lack of trust in the government and a lack of public support for urban planning initiatives.
- The Territory Strategy document in Albania is a planning document that provides a long-term vision for the sustainable development of Albania's territory and sets out the policies, strategies, and actions needed to achieve this vision.
- Sustainable urban planning is an important priority for Albania, as the country seeks to balance economic growth with social and environmental sustainability. The country has made significant strides in this area but continues to face challenges related to rapid urbanization, infrastructure development, and environmental degradation. Some of the main challenges include limited financial resources, lack of political will, limited technical expertise, and cultural barriers.
- Promoting social cohesion in Albania requires a holistic approach that considers the interrelationships between urban planning, community engagement, and social services, while

also tackling the challenges of informal settlements, quality of education and the access to affordable housing by marginalized groups.

- A high priority for more sustainable forms of transport will drive more efficient use of road space, enhance the attractiveness of non-motorized modes, and improve the accessibility of specific locations. It will also reduce environmental damage, make street space more attractive and improve road safety for non-motorists. Therefore, it's very crucial for this point to be a priority in the planning documents.
- Policies that allow population density to increase can also sometimes control the cost of housing.
- Regarding land distribution and registration, there was a wave of emigration to the neighbouring countries with Western-style free market economies. This was accompanied by a massive urbanization movement, with the population of greater Tirana increasing from 275,000 to 800,000 citizens in a short time. Thus, those informal developments caused tremendous changes in the urban configuration of the main cities in middle Albania, mainly in Tirana and Durrës. It is estimated that approximately more than 40,000 hectares of land were occupied either illegally or informally by over 300,000 informal buildings or constructions. The government is still facing many challenges to address these issues with an adequate solution.

3 Consolidation report of task 2.2

This report focused on EU initiatives and policies related to urban development and climate change.

3.1 Introduction and objectives of task 2.2

Report 2.2 provides an overview of EU initiatives and policies related to urban development and climate change. It examines the various innovative technological solutions used in Climate-Smart Urban Development (CSUD) initiatives, which take the form of regulatory frameworks, best practices and emerging trends across the EU. Due to the wide range of policies and initiatives in the European Union, Report 2.2 presents only a selection of policies and initiatives in order to cover the most important ones. To make a delimitation, the main issues analyzed are those related to the curriculum, and thus dealing with planning, design, energy efficiency, water management and planning policies. The table is therefore not exhaustive.

It also examines how European policies have been implemented at the national level in several EU Member States (Austria, Croatia, Germany and Spain, plus additionally Norway and Serbia) and presents some examples of CSUD projects. Through these countries' contributions to national policies and best practices, the report provides valuable insights into the role of innovative technological solutions in promoting CSUD and creating a more sustainable, livable and resilient urban environment across Europe.

The European Union has set ambitious goals through the European Green Deal to combat and mitigate the effects of climate change and promote sustainable development. As part of this effort, the EU has introduced a range of legislation and policies related to urban development and the urban environment to promote more sustainable, healthy and competitive urban areas while addressing the challenges of climate change.

The EU has a long-term strategy to become carbon neutral by 2050 - an economy with zero net greenhouse gas emissions. As part of the European Green Deal, on March 4, 2020, the EU Commission proposed the first European climate law to enshrine the goal of climate neutrality in law.

3.2 Results of task 2.2

In the following, the results of the report are presented in the form of a table (Table 1). The title of the policy or initiative is given, as well as the year and the topics considered by this policy in relation to the nine topics of the curriculum.

3.2.1 EU initiatives and policies related to urban development

Table 1: Evaluation of EU policies and initiatives

Policies	Year	1) Spatial and urban planning	2) Architecture and building design	3) Material science	4) Energy efficiency	5) Road design and mobility	6) Urban water management	7) Geodesy and analysis	8) Planning and participation procedures	9) Governance and planning policies
Proposal for a revised Urban Wastewater Treatment Directive	2023				X		X		X	X
EU Mission - 100 climate-neutral and smart cities by 2030	2022	X			X				X	
REPowerEU Plan	2022				X					
Cohesion Plan	2021	X			X					X
Hydrogen Strategy	2020				X		X			
Urban Greening Platform	2020	X			X		X		X	
European Climate Pact	2020	X	X		X	X	X		X	X
European Climate Law	2020	X			X		X		X	X
A European Green Deal	2019			X	X	X	X		X	X
New Urban Agenda	2016	X			X				X	X
Circular economy action Plan (CEAP)	2015				X					
The Paris Agreement	2015				X					
Urban Innovative Actions (UIA)	2014								X	X
Urban Mobility Package	2013				X	X				
EU Adaptation Strategy	2013	X	X		X				X	X
2020 Climate and Energy Package	2009				X					X
Directive 2007/2/EC: Infrastructure for Spatial Information in the European Community (INSPIRE)	2007				X			X		X
Water Framework Directive	2003						X			X
URBACT	2002	X							X	
European Climate Change Programme (ECCP)	2000	X	X		X		X		X	X

3.2.2 National implementation in the EU Member States (+ Norway and Serbia)

Based on the contributions from several EU Member States (+ Norway and Serbia), the following list was compiled. Again, only some national policies without guarantee of completeness are presented. Each partner has tried to cover a range of topics as broad as possible, but has mainly contributed in its "expert area".

Again, the topics covered by the policies, in relation to the curriculum, are shown and compared (Table 2).

Table 2: Evaluation of national policies from several EU Member States (+ Norway and Serbia)

Country	Policies	Year									
			1) Spatial and urban planning	2) Architecture and building design	3) Material science	4) Energy efficiency	5) Road design and mobility	6) Urban water management	7) Geodesy and analysis	8) Planning and participation procedures	9) Governance and planning policies
Austria	Austrian Strategy for Adaptation to Climate Change	2017	X	X		X	X	X			X
	General Wastewater Emission Ordinance	1996						X			
	Water Rights Act	1959						X			
Croatia	Recovery and resilience plan for Croatia	2021									X
	Water Act	2019						X			
	Law on state survey and Real-estate cadaster + Law on performing geodetic activities	2018							X		
	Law on national spatial data infrastructure (NSDI)	2018	X	X		X	X	X	X		X
	Strategy of spatial development of Republic of Croatia	2017	X								X
	Law on energy efficiency	2014				X					
	Law on spatial planning	2013	X							X	X
	Construction act & Construction products act	2013		X							
Germany	National Water Strategy	2023						X			
	Building Energy Act	2020	X	X	X	X					
	Federal programme for the adaptation of urban areas to climate change	2020	X	X	X	X		X		X	X
	Guideline for sustainable building	2020	X	X	X	X					

Country	Policies	Year									
			1) Spatial and urban planning	2) Architecture and building design	3) Material science	4) Energy efficiency	5) Road design and mobility	6) Urban water management	7) Geodesy and analysis	8) Planning and participation procedures	9) Governance and planning policies
Germany	Urban energy rehabilitation - climate protection and climate adaptation in the neighborhood	2011	X	X	X	X		X		X	X
	Act on Access to Digital Spatial Data	2009							X		X
	Federal Water Act	1996						X			
Norway	National strategy for social housing policies	2022		X						X	X
	Norway's Climate Action Plan	2021	X	X				X		X	X
	Strategy for developing a green, circular economy	2021				X				X	X
	Long-term low-emission strategy	2020	X	X		X				X	X
	Climate Change Act	2018	X	X		X				X	X
	Energy Policy	2017		X		X					X
	Planning and Building Act	2008	X							X	X
Serbia	Towards a national architectural strategy draft	2023		X						X	X
	Energy management system	2022				X					X
	Law on the use of renewable energy sources	2021				X					X
	Law on energy efficiency and rational use of energy	2021				X					X
	National Housing Strategy 2020-2030 draft	2020		X						X	X
	Law on planning and construction	2020	X							X	X
	Law on housing and maintenance of buildings	2020		X		X			X	X	X
	Strategy for sustainable urban development of the republic of Serbia by 2030	2019	X	X			X	X	X	X	X
	National social housing strategy	2012		X						X	X
	Regulation on energy efficiency of buildings	2011		X		X				X	X
Water law	2010						X				

Country	Policies	Year									
			1) Spatial and urban planning	2) Architecture and building design	3) Material science	4) Energy efficiency	5) Road design and mobility	6) Urban water management	7) Geodesy and analysis	8) Planning and participation procedures	9) Governance and planning policies
Spain	Sustainable Mobility Law (Draft) Approval Expected in 2023	2023					X				X
	Royal Decree 3/2023 establishing the technical-sanitary criteria for the quality of drinking water, its control and supply	2023						X			X
	Energy Efficient Act Royal Decree-Law 14/2022 on economic sustainability measures in the field of transport, in terms of scholarships and study aid, as well as measures for saving, energy efficiency and reducing the energy dependence of the Natural gas	2022		X		X	X				X
	Law 9/2022: Law on Quality in Architecture (Ley de Calidad de la Arquitectura)	2022	X	X	X	X			X	X	
	Royal Legislative Decree 7/2015: Law on Land and Urban Rehabilitation	2015	X	X				X	X		X
	Law 22/2011: Land Pollution Act	2011	X								X
	Royal Decree 1391/2007, which regulates The Spanish Committee of Geodesy and Geophysics	2007							X	X	X
	Law 34/2007 on air quality and protection of the atmosphere	2007	X			X				X	X
	Spanish Building Act 38/1999 Law on Building Regulations (Ley de Ordenación de la Edificación)	1999	X	X							X

Based on the table presented above, it can be noted that all contributing countries are active in all areas and have adopted policies especially in the last 15 years and since the publication of the EU Green Deal (2019).

3.2.3 Best practices from EU Member States (+ Norway and Serbia)

Table 3 shows examples of the best practice initiatives of several EU Member States (+ Norway and Serbia).

Table 3: Evaluation of best practices in several EU Member States (+ Norway and Serbia)

Country	Policies	Year	1) Spatial and urban planning	2) Architecture and building design	3) Material science	4) Energy efficiency	5) Road design and mobility	6) Urban water management	7) Geodesy and analysis	8) Planning and participation procedures	9) Governance and planning policies
Austria	Smart Climate City Strategy Vienna	2022	X	X		X	X	X		X	X
Croatia	Multi-annual programme of cadastral surveys of construction areas for the period 2021-2030	2021							X		X
	Information system of spatial planning	2021	X							X	X
	Zagreb spatial data infrastructure	2013	X				X	X	X	X	X
Germany	Connected Urban Twins (CUT)	2021	X	X		X		X		X	
	Jenfelder Au, Hamburg	2011	X	X		X		X			
	Hamburg as an example of sustainable urban development	2009	X	X		X		X		X	
	Kronsberg Model – Ecological Building for the future	1998	X	X		X	X	X		X	X
Norway	How Europe's rainiest city is turning storm-water into a resource	2018	X	X				X		X	X
	Energy Labelling of housing and building in Norwegian	2010		X		X				X	X
Serbia	Affirmation of the concept of Sustainable Urban Mobility	2022	X	X				X		X	X
	Clean Energy and Energy Efficiency for citizens in Serbia	2022	X			X				X	X
	Energy Management System	2022				X				X	X
	The National Urban Forum	2022	X	X		X				X	X
	Action plan for the implementation of the sustainable urban development strategy of the republic of Serbia until 2030 for the period from 2021 to 2022	2021	X							X	X
	ENERGY PASSPORT - a certificate of the energy performance of buildings	2009		X		X					

Spain	Alcobendas - Digital Innovation Hub for the smart city	2020	X	X	X	X	X	X		X	X
	Smart Tourist Destination Programme	2019	X			X	X			X	X

3.2.4 Networks and cooperation

The following networks and cooperation initiatives have been established in the European Union:

- Smart Cities Marketplace
- Global covenant of Mayors for Climate and Energy
- BUILD UP
- EIT Urban Mobility
- European Covenant of Companies for Climate and Energy
- European Energy Research Alliance (EERA) Joint Programme Smart Cities
- European Energy Efficiency Platform (E³P)
- European Innovation Partnership on Smart Cities and Communities (EIP SCC)
- mySMARTLife
- Danube Region strategy
- #connectedinEurope
- D-A-CH Cooperation Smart Cities
- Smart cities member states initiative
- Smart City Dialogue (Germany)
- Model projects Smart City (MPSC, Germany)

3.3 Conclusion

It can be concluded that the European Union is active in a wide range of areas. Many of the initiatives and policies build on the EU Green Deal (2019) and the Paris Agreement (2015), respectively.

In addition, many networks have been created to enable networking among EU member countries and facilitate collaboration. This makes it easier to share important lessons learned and allows experts to exchange technical information. In urban development in particular, it has become clear that there is a shift from building as quickly and cheaply as possible to sustainable, smart systems. It is important that each sector is no longer dealt with individually, but that there is also internal collaboration between urban planners, water and wastewater experts, and open space planners.

4 Consolidation report of task 2.3

This report focused on the analysis of existing curricula related to CSUD in several EU Member States on the one hand and in Montenegro, Bosnia and Herzegovina and Albania on the other hand.

4.1 Introduction

The project "Curricula innovation in climate-smart urban development based on green and energy efficiency with the non-academic sector / SmartWB" is undertaken to carefully treat curricula and update them in the above-mentioned studies. This initiative is an endeavour for academic reform to raise knowledge and capacity of young experts at national and international level. The wider objective of this project is to improve the quality of higher education all over western Balkan countries. Based on previous discussions and analysis of curricula of EU Member States, it was identified that they are more stable and more advanced, while WB countries' curricula are shorter in experience and require further development. It is also preferable that higher education in the Western Balkans develops with harmonized curricula. Based on literature research and research on developed projects related to curriculum comparison, it has been ascertained that there are several methods of curriculum comparison and classification. For this study, we have split the curricula into two groups to see their consistency and differences.

The report summarizes the existing curricula in CSUD of all project HEIs (Higher Education Institutions) and provides a comparative analysis which can lead to the improvement of existing courses or the development of new courses according to the presented EU curricula.

4.2 Overview of typology

The typology is briefly explained to clarify the process on curriculum evaluation and comparison. The first step was the collection and systematization of curricula, or rather the collection of study programs by HEI of EU Member States in the SmartWB project.

- Database: Universities → Study programs → Modules → Courses
- Course characteristics:
 - Course name
 - Category of course
 - Number of hours
 - Credits ECTS

The database of courses is then filtered based on the first two characteristics above, i.e. by course name and category of course.

Through this process, we have classified the courses included in the database into 9 groups:

- Spatial and urban planning
- Architecture and building design.
- Material science
- Energy efficiency
- Road design and mobility

- Water Engineering
- Geodesy and analysis
- Planning and participation procedures
- Governance and planning policies.

4.3 Collecting curricula from all partners

Considering the difference in the level of curriculum development in HEIs of EU Member States and the development of HEI curricula in the three WB countries, two groups of curricula have been formed:

- The first group includes: the curricula of the EU Member States from the universities with advanced curricula.
- The second group includes: the curricula of the WB countries' HEI, which are certainly on the way to raising their quality.

In Table 4 the data is presented including information of institutions and their module-orientations on BSc. and MSc study programs for all partners.

Table 4: Number of modules where the courses will be modernized for each university

No	Code	G-1. Program partners from Universities	Country	BSc No. of Modules	Msc No. of Modules
1	02/UNI	UNIVERZITET U NISU	RS	2	4
2	03/BOKU	UNIVERSITAET FUER BODENKULTUR WIEN	AT	2	3
3	04/NMBU	NORGES MILJO-OG BIOVITENSKAPLIGE UNIVERSITET	NO		1
4	05/UNIZG	SVEUCILISTE U ZAGREBU	HR	1	2
5	06/URJC*	UNIVERSIDAD REY JUAN CARLOS	ES	3	11
6	07/TH OWL	TECHNISCHE HOCHSCHULE OSTWESTFALEN-LIPPE	DE	4	2
		G-2. Partners Universities from partner countries			
7	01/UoM	JAVNA USTANOVA UNIVERZITET CRNE GORE PODGORICA	ME	1	3
8	08/UNSA	UNIVERZITET U SARAJEVU	BA		2
9	09/UNMO	UNIVERZITET DZEMAL BIJEDIC U MOSTARU	BA		1
10	10/UNBI	UNIVERZITET U BIHACU	BA	2	1
11	11/UET	UNIVERSITETI EUROPIAN I TIRANES	AL	1	2
12	12/UPT	UNIVERSITETI POLITEKNIK I TIRANES	AL	1	1
13	13/POLIS	UNIVERSITETI POLIS SHPK	AL		1
		Total		12	24

**Note that due to the fact that URJC does not have a Civil Engineering School the information about the courses is from the Barcelona School of Civil Engineering – Universidad Politécnica de Cataluña.*

Each study program is named by the University where the program takes place. Furthermore, the list with the number of modules is shown according to the name of the study program at the Universities:

• Civil Engineering	14 Modules
• Environmental Engineering	8 Modules
• Marine Sciences & Technologies	1 Modules
• Structural & Construction Engineering	2 Modules
• Numerical Methods in Engineering	1 Module
• Geotechnical Engineering	3 Modules
• Structural Analysis of Monuments & Historical Constructions	1 Module
• Urban Mobility	2 Modules
• Infrastructure Management and Traffic	1 Module
• Water Resources and Environmental Engineering	3 Module
• Roads and Transportation	1 Module
• Environmental Infrastructure Management	1 Module
• Spatial planning	1 Module
• Building materials	1 Module
• Energy efficiency of buildings	1 Module
• Architecture	5 Modules
• Geodesy	6 Modules
• Urban Planning & Management	1 Module

Regardless of how the study program will be named, theoretical problem-solving skills can only be achieved through modern and flexible academic education. While professional, technical and practical achievements are gradually gained through career development and experience.

4.4 Methodology of grouping curricula and courses

The wider objective of this project is to improve the quality of higher education all over western Balkan countries. Therefore, development of academic reforms on CSUD are necessary to raise the knowledge and capacity of young experts at national and international level. In the SmartWB project, WP2. T2.3, we consider curricula from EU Member States which are more stable and more advanced, due to their tradition and experience. While universities from WB countries have good curricula, in some cases due to economic and political situations or lack of experience, lack of capacity, curricula have been developed more slowly. It is also preferable that higher education in CSUD in Western Balkan countries develops with harmonized curricula. The aim of this task is the specification and analysis of the gap of education between offered courses at universities of EU Member States and WB countries, especially regarding the technologically advanced courses.

The required data for the analysis were processed in three steps:

- List of courses per year for each semester, on the BSc. and MSc. study program from each HEI
- List of typologies that includes each course, and
- Establishment of a typology into 9 groups.

The curricula specify the following main parameters for each course: Course name, course contents, course outcome with expected results, the number of hours for lectures and exercise sessions, ECTS credits, and year and semester of studies. For the comparison of curricula, one can use different methodologies by which the courses are classified into different groups.

4.5 List of groups with respective typology courses

The list of course groups presented below is based on analysis of the names and content of module courses by the HEI in EU Member States. Following the similarity of the names and the similarity in content, we have categorized all the courses into 9 groups which fall in accordance with climate-smart urban development:

- Spatial and urban planning
- Architecture and building design.
- Material science
- Energy efficiency
- Road design and mobility
- Urban water management
- Geodesy and analysis
- Planning and participation procedures
- Governance and planning policies.

4.6 Comparing curricula between groups

The aim of this task is the specification and analysis of the gap of education between courses offered at universities of WB countries and EU Member States, especially regarding the technologically advanced courses. This will then be used as a supporting tool for specifying new curricula and courses at the WB countries. Consequently, two major questions will be answered, namely:

- 1) What are the major structural differences at a curriculum level between WB countries and EU Member States? Which academic disciplines are over- and under-represented in the various countries?
- 2) What are the major structural differences at a course level between universities in WB countries and universities in EU Member States? Is there a difference in technologically advanced courses and if yes, is that difference important for the future employers of the students?

The comparison was realized on three levels:

- Comparison of curricula within EU Member States (group 1),
- Comparison of curricula within WB countries (group 2),
- Comparison of curricula of group 2 with curricula from group 1.

Table 5 shows a summary of database about HEI in BSc. study programs and MSc. study programs.

Table 5: Summary of database about HEI in BSc and MSc study programs

Study program	No. of universities	No. of modules	No. of courses
BSc	9	17	749
MSc	13	35	1092
		52	1841

Table 6 and Figure 1 cover the comparison on the BSc. level, while Table 7 and Figure 2 address the comparison on the MSc. level.

Table 6: Comparison of curricula from group 2 with curricula from group 1 (BSc. study program)

BSc.	Spatial and urban planning	Architecture and building design	Material science	Energy efficiency	Road design and mobility	Urban water management	Geodesy and analysis	Planning and participation procedures	Governance and planning policies
Group 1	5%	6%	2%	6%	3%	9%	10%	4%	3%
Group 2	1%	5%	9%	0%	8%	4%	10%	2%	0%

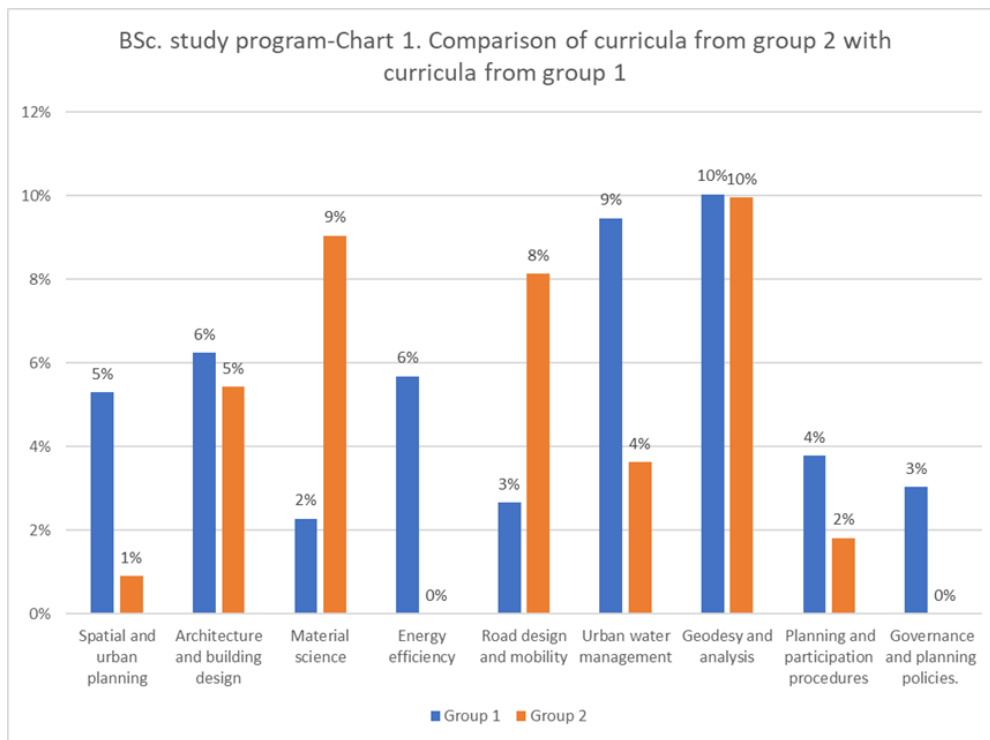


Figure 1: Comparison of BSc. curricula from group 2 with curricula from group 1

A key finding is that the BSc. programs in group 1 have higher concentration of “Spatial and Urban planning”, “Energy Efficiency” and “Governance and planning policies” related subjects. Meanwhile, in the BSc. programs of group 2 there is less to no concentration of such subjects. Given the importance of these topics, and the fact they are in accordance with the development of the field today and in the future regarding Climate Smart Urban Development, we conclude that the programs of group 2 indeed need to be modernized focusing on the aforementioned subjects.

Table 7: Comparison of curricula from group 2 with curricula from group 1 (MSc. study program)

MSc.	Spatial and urban planning	Architecture and building design	Material science	Energy efficiency	Road design and mobility	Urban water management	Geodesy and analysis	Planning and participation procedures	Governance and planning policies.
Group 1	5%	11%	2%	3%	5%	15%	8%	2%	2%
Group 2	6%	6%	6%	3%	7%	9%	8%	3%	4%

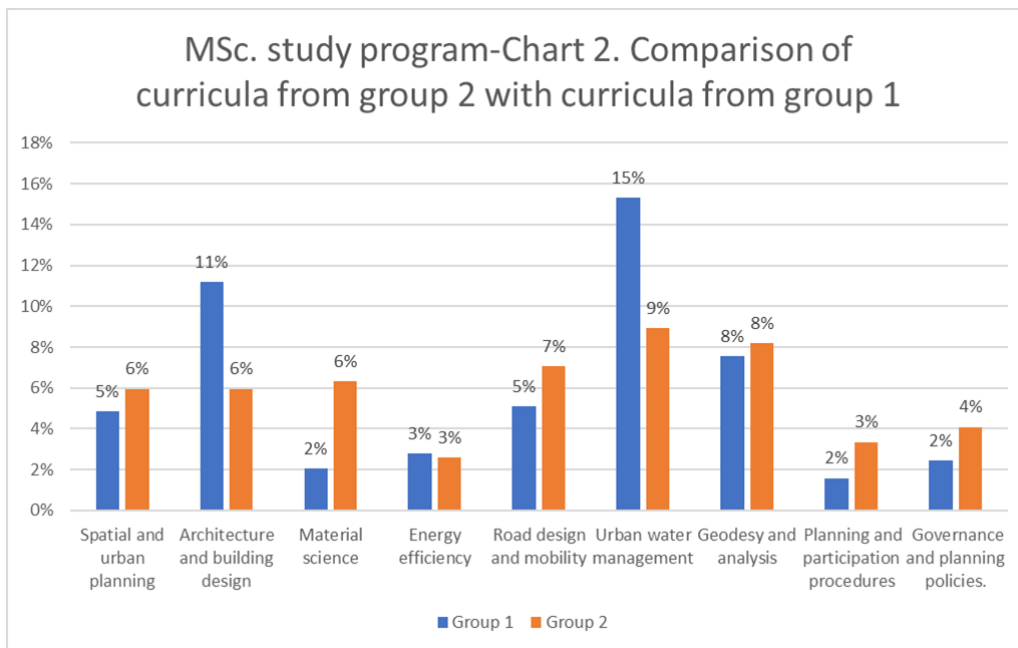


Figure 2: Comparison of MSc. curricula from group 2 with curricula from group 1

In Figure 2, we can see that the MSc. programs of groups 1 and groups 2 have some similarities and differences. A key finding is that the concentration of “Spatial and Urban planning”, “Material Science”, “Planning and participation procedures” and “Governance and planning policies” subjects is lower in universities of the EU Member States than in WB universities. Also, in WB universities there is a lower representation of subjects in the categories of “Architecture and building design” and “Urban water management”. Thus, we conclude that, while the groups 1 and 2 have higher similarities for the MSc. program, there is still room for improvement, harmonization and modernization of curricula related to CSUD.

4.7 Summary and conclusions on improvement of the existing courses and the development of new courses.

Climate change is a global challenge and cities are at the forefront of the response. The European Union and other countries around the world are taking steps to promote climate-smart urban development. In this report, we analysed existing curricula related to climate-smart urban development in EU Member States (+ Norway and Serbia) and western Balkan countries (Montenegro, Bosnia and Herzegovina and Albania).

Countries in the Western Balkans are developing and aim that in the future their capacities regarding climate-smart urban development will be equal to those of other countries within the European market. Certainly, the professional and academic preparation of experts in this field begins at the appropriate universities. Thus, academic staff has a high scientific and research responsibility for actively providing knowledge, skills, and competences to aspiring experts in the field of climate-smart urban development.

The curricula determine the following parameters for each course: course name, course contents, course outcome with expected results, the number of hours for lectures and exercise sessions, ECTS credits, and year and semester of studies. For the comparison of curricula one can use different methodologies by which the courses are classified into different groups. Here we have classified the courses into nine groups, which contain topics related to CSUD:

- Spatial and urban planning
- Architecture and building design.
- Material science
- Energy efficiency
- Road design and mobility
- Water Engineering
- Geodesy and analysis
- Planning and participation procedures
- Governance and planning policies.

From these comparisons, we derive the following conclusions:

There are some structural differences at a curriculum level between the universities of EU Member States and the WB universities. The BSc. programs in universities of EU Member States have higher concentration of “Spatial and Urban planning”, “Energy Efficiency” and “Governance and planning policies” related subjects. Meanwhile, in the BSc. programs of WB universities there is less to no concentration of such subjects. Given the importance of these topics, and the fact they are in accordance with the development of the field today and in the future regarding the Climate Smart Urban Development, we conclude that a modernization of the BSc. curricula in WB countries is recommended.

A key finding of the comparison of MSc. curricula is that the concentration of “Spatial and Urban planning”, “Material Science”, “Planning and participation procedures” and “Governance and planning policies” subjects is lower in universities of the EU Member States than in WB universities. Also, in WB universities, there is a low representation of subjects in the categories of “Architecture and building design” and “Urban water management” Thus, we conclude that, while the universities of EU Member

States and WB universities have higher similarities for the MSc. program, there is still room for improvement, harmonization and modernization of curricula related to CSUD.

Reforms of the study programs of WB countries need to be in accordance with the regional and European developments. The objectives of study programs in CSUD need to be related to the following key factors: Development and awareness of students for continued professional education, and protection of the environment based on the EU model.

The content of the curricula of HEI in WB countries is under ongoing development. But in some cases, due to economical restrictions and political situations or lack of experience or capacity, curricula have been developed more slowly. It is necessary to harmonize the contents of courses from all three WB countries according to more advanced curricula of the HEI in EU Member States.

The courses that will be modernized based on climate-smart urban development include urban planning and design, environmental science, sustainable energy, transportation planning, and building science. These courses need to be revised to include the latest innovations and technologies that promote sustainable urban development and reduce the carbon footprint. It is essential to modernize these courses to prepare future urban professionals for the challenges related to climate change.

Collaboration between the non-academic sector and academic institutions is essential to develop innovative curricula that promote green and energy-efficient solutions for urban development. These curricula provide valuable resources for urban professionals to develop the skills and knowledge needed to promote green and energy-efficient solutions for urban development and to address the challenges related to climate change.

5 Summary of task 2.4 – Workshop in Vienna

5.1 Agenda and objectives

The workshop on climate-friendly and innovative solutions: current and future challenges took place in Vienna from 31st May to 2nd June 2023 (Figure 3). The workshop focused on the related tasks of WP2 and aimed at finding synergies of issues related to CSUD within the programme countries. The main results of reports 2.1-2.3 were presented and discussed. At the heart of the workshop, interactive sessions were organised to facilitate communication and exchange of knowledge and expertise among the participants. Using the method of World Café, a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) focusing on four key topics with regard to identifying issues related to urban development in Montenegro, Albania and Bosnia and Herzegovina was applied.

The World Café was structured along the three steps:

- Intro: Topic and discussion question related to CSUD: Identification of issues related to urban development in Montenegro, Albania, Bosnia and Herzegovina. The four key topics were presented for each country.
- Small group discussions were structured along the SWOT Analysis focusing on each of the four key topics. For each country, four tables were organized and participants took part in the discussion of two key topics. Each round was held 20 minutes and the main results were captured on a flip chart.
- The Table-hosts were pre-selected and assigned to take notes on the flipchart and to report the central messages and points of discussion to the group.

<p>Wednesday 31st May</p> <p>Morning 10:30-13:00</p> <p>Welcome and introduction to the Workshop (BOKU, Florian Reinwald, Doris Damyanovic)</p> <p>EU initiatives and policies related to CSUDs Report - D2.2 (THOWL, Martin Oldenburg, Anna Mues)</p> <p>Report on existing curricula related to CSUD Report - D2.3 (UPT, Genti Qirjazi)</p>	<p>Thursday 1st June</p> <p>Morning 9:30-13:00</p> <p>Interactive Sessions on challenges and pathways:</p> <p>Focus on: Montenegro (UoM, Ivana or Marija)</p> <p>Focus on: Albania (POLIS, Sadmira)</p>	<p>Friday 2nd of June</p> <p>Morning 9:30-13:00</p> <p>Interactive Sessions on challenges and pathways:</p> <p>Focus on: Bosnia and Herzegovina (UNSA, Emina or UNMO Marko)</p> <p>Summary and Synergies</p> <p>Concluding remarks on WP2</p>
<p>Afternoon 14:00-15:30</p> <p>Steering Committee meeting</p>	<p>Afternoon 14:00-16:20</p> <p>Project Management Committee meeting</p>	<p>Afternoon 13:30-15:00</p> <p>Quality Assurance Committee meeting</p>

Figure 3: Program of the workshop

The framework of a SWOT analysis was used to structure the discussions during the World Café sessions (Figure 4). The aim was to discuss how the gained insights can be implemented in future strategies.

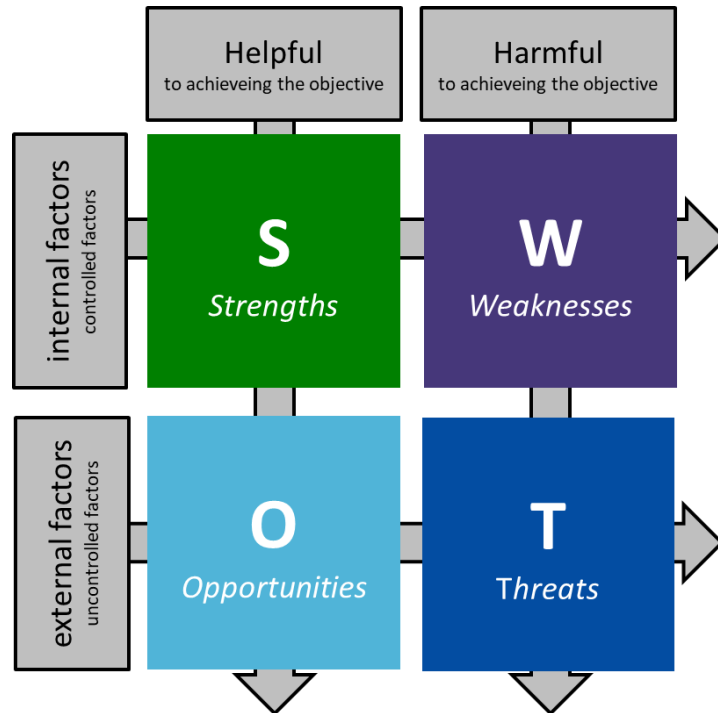


Figure 4: Basic framework of a SWOT analysis

5.2 SWOT analysis for key issues in Montenegro

For Montenegro the following four key topics were presented and discussed:

- 1) Reducing car dependency
- 2) Improving waste management
- 3) Improving the energy efficiency of new and existing buildings
- 4) Improving irrational and inefficient use of water

5.2.1 Reducing car dependency

In Montenegro, the transport sector has a share of 10 % of the final energy consumption. Road transport accounts for almost 90 % of energy consumption in the transport sector, with the dominant share of passenger cars. CO₂ emissions from traffic come from burning fuel, so by saving fuel, i.e. by economic consumption, significant reductions in CO₂ emissions can be achieved. Regarding fuels, diesel fuel consumption is the dominant source of greenhouse gas (GHG) emissions in the transport subsector, accounting for over 60 %.

Findings of the SWOT analysis:

The strengths of Montenegro in achieving a reduced car dependency lies in the abundance of small cities and villages with short distances, which is beneficial in establishing and promoting other forms of transport, e.g. public transport or walking and cycling. Weaknesses could be inappropriate existing infrastructure (e.g. narrow streets are not suited for busses) or the attitude of people shown in their unwillingness to change their behaviour and let go of the status symbol “car”.

An opportunity for Montenegro for reducing their car dependency could be EU funding possibilities to increase their transport system. A threat on the other hand could be young people leaving the country, leading to a lack of local workforce, which would be needed for expanding the transport infrastructure.

5.2.2 Improving waste management

Montenegro needs to adequately manage waste, including the establishment of appropriate infrastructure and the raise of public awareness. Sustainable urban development must include strategies to reduce waste generation, promote recycling and reuse, and develop adequate waste management infrastructure. Waste selection (primary and secondary) should serve as a prerequisite for reusing and recycling waste materials. Although the implementation of the recycling of waste components, which have their reusable value, is set as an imperative in sustainable waste management in Montenegro, the results are still at a low level.

Findings of the SWOT analysis:

In Montenegro, there exist some policies regarding waste management, but the implementations are lacking. Weaknesses could be missing waste management infrastructure (containers, landfills, etc.) and a low level of public awareness of the topic, but an advantage in reaching the goal of an improved waste management could be that Montenegro is a small country both in space and population. Opportunities could be an economic improvement in terms of creating jobs and ecological improvement in terms of less pollution for the environment. A threat in reaching the goal could be an ongoing habit of illegal waste dumping as it is done widely today in Montenegro.

5.2.3 Improve the energy efficiency of new and existing buildings

It is necessary to improve the energy efficiency of new and existing buildings, e.g. by sustainable spatial urban planning, improvement of the quality of construction works and the use of sustainable construction products, the raise of standards in terms of energy efficiency and a greater use of energy from renewable sources in residential buildings.

Findings of the SWOT analysis:

Again, a legal framework and technical guidelines are published, but not in use. Additionally, there seems to be a lack of competence in design and construction of energy efficient buildings in Montenegro. Also, the awareness of the general public about energy efficiency is too low and should be raised. Opportunities on the individual building level would be a decrease of operational expenses (heating costs) and an increase of the market value of the building. On the national level, a higher number of energy efficient buildings would facilitate Montenegro's integration into the EU. Furthermore, additional jobs could be created and technological expertise at universities regarding energy efficient materials could be established. A threat in reaching the goal of improved energy efficiency of buildings could be a lack of funding.

5.2.4 Improving irrational and inefficient use of water

Irrational and inefficient use of water is evident, which for example manifests itself in significant losses in water supply systems, unintended consumption of water, absence of recycling, i.e. reuse of water on a considerable scale, etc.

Findings of the SWOT analysis:

Due to the geographical and hydrological circumstances in Montenegro, nature provides enough water for the low number of inhabitants. However, the existing water supply system shows scattered water leakage and needs to be repaired. Opportunities could be a reuse and multi-use of water, but climate change could be a threat with possible water scarcity conditions in the future. Regarding wastewater management, there is still a lack of public awareness, how wastewater should be collected and treated sustainably. The number of wastewater treatment facilities should be increased as well.

5.3 SWOT analysis for key issues in Albania

In the case of Albania, the four key topics were:

- 1) Improving spatial planning policies (energy and climate plan)
- 2) Sustainable urban development through a sustainable mobility plan
- 3) Protection of the environment and resources
- 4) Informal settlements

5.3.1 Improving spatial planning policies (energy and climate plan)

The improvement of spatial planning policies including the energy and climate plan will help to mitigate the impacts of climate change by integrating climate policy and measures to reduce greenhouse gas emissions into all relevant sectoral policies. Additionally, the standards in terms of energy efficiency and greater use of energy from renewable resources should be raised.

Findings of the SWOT analysis:

In Albania, the legal framework and guidelines for energy and climate policies exist, but there is a lack of implementation in practice. The current electricity source in Albania is mostly from hydropower plants, but it is not very reliable since water levels fluctuate. However, the Mediterranean climate shows great potential for solar power. Weaknesses in reaching the goal of improved spatial planning policies are the lacking of guidelines for operational energy system management and legislations regarding energy trading with neighbouring countries. Besides, most of the planning seems to be done for urban areas and rural areas are rarely included. The EU provides good funding opportunities regarding energy planning, but a threat could be that young people are leaving Albania leading to a decreased incentive for EU support.

5.3.2 Sustainable urban development through a sustainable mobility plan

The sustainable mobility plan will help to manage the growth of urban traffic and promote the use of public transportation, biking and walking. Furthermore, the development of sustainable forms of transport and the efficient use of public and road space should be intensified.

Findings of the SWOT analysis:

Mobility is currently widely discussed in Albania and especially the capital of Tirana shows great potential in developing a sustainable mobility plan. Regarding public transport, only buses and electric taxis are operating in Tirana at the moment, which is not suitable for a city with that many inhabitants. Additionally, most of the companies are privately owned which leads to a lack of infrastructure for public

transport, e.g. rail tracks for electric trams. Therefore, spatial planning and public transport planning needs to be combined and should be done and implemented by public institutions.

5.3.3 Protection of the environment and resources

Protection of the environment and resources includes all issues related to waste management and treatment. A collaboration with the civil society should be realised.

Findings of the SWOT analysis:

Similar to Montenegro, the legal framework and technical guidelines for the protection of the environment and of natural resources, particularly for waste management, are in existence, but the implementations are lacking. The reason for that seems to be an unclear distribution of responsibilities regarding operational waste management, as well as missing facilities for collecting and processing waste. Therefore, waste infrastructure and additional research at universities, e.g. for recycling technologies, should be expanded. This would lead to less pollution of the environment and a higher chance to become an EU member state.

5.3.4 Informal settlements

Informal settlements are a common feature of urban areas in Albania, particularly in Tirana and Durrës etc. These settlements often lack basic infrastructure and services, such as water and sanitation facilities, and residents may be at risk of eviction. Addressing the needs of residents in informal settlements is important also for social cohesion.

Findings of the SWOT analysis:

The goal of rationalizing informal settlements including the technical improvement of the supply and disposal system of resources (water, wastewater, waste, electricity, energy) is generally supported by politics. However, the long-lasting timeframe of this process often exceeds the terms of office of the responsible politicians leading to a stagnating progress. Additionally, the budget for rationalizing these settlements is currently too low and needs to be raised.

5.4 SWOT analysis for key issues in Bosnia and Herzegovina

For Bosnia and Herzegovina, the following four key topics were addressed:

- 1) National plans in Bosnia and Herzegovina
- 2) Reducing car dependency
- 3) Waste management
- 4) Water management

5.4.1 National plans in Bosnia and Herzegovina

The unique complex administration and government system of Bosnia and Herzegovina leads to a slow adoption of new laws and legislations. Therefore, national plans should be organised and designed in an efficient way. Especially, the problematic occurrences of illegal construction activities should be addressed in the different national plans. The national plans will help Bosnia and Herzegovina to reach the objective of joining the European Union.

Findings of the SWOT analysis:

The legislation and guidelines for different national plans exists in Bosnia and Herzegovina, but is currently often not implemented into practice. Additionally, there is an unclear distribution of responsibilities of the state institutions combined with a lack of capacity of the different entities. Further, the national plans need to be included in the university curricula. However, the adoption of EU regulations will help Bosnia and Herzegovina with their current challenges and increase the chance of becoming an EU member state.

5.4.2 Reducing car dependency

In Bosnia and Herzegovina, there exist a large number of cars, but no significant programmes for reducing car dependency have been established so far. In fact, CO₂ emissions even rose significantly in recent years coming from the transportation sector. The initiative of introducing bicycles and scooters should be enlarged.

Findings of the SWOT analysis:

Regarding the reduction of car dependency in Bosnia and Herzegovina, the legal framework is existing, but again not implemented into practice. There is a lack of infrastructure for public transport, but its expansion could be achieved with the will of politics since the transport companies are state-owned. The current focus on E-mobility is beneficial for the climate, but shows no effect in reducing the car dependency. Therefore, the focus should be shifted to public transport and cycling for reaching the goal. Furthermore, the cooperation between municipalities and universities should be enhanced.

5.4.3 Waste management

In Bosnia and Herzegovina, waste separation is rarely carried out. The legislation for waste management is available, but often not implemented. Only a low number of facilities for recycling or incineration exist in the country. Additionally, a problem with the high amount of demolition waste remains present. All these circumstances lead to the development of “wild” landfills, which are not authorised and affect the environment negatively.

Findings of the SWOT analysis:

Again, in the case of waste management, guidelines exist, but are currently not implemented leading to a lack of infrastructure, e.g. waste collection and waste processing facilities. Additionally, there seems to be a lack of awareness in the general public on the consequences of illegal waste dumping. However, an improvement of waste management in Bosnia and Herzegovina could lead to newly created jobs and business opportunities leading to a reduction of young people leaving the country.

5.4.4 Water management

In Bosnia and Herzegovina, water management is very complex from a legal, economic, financial and institutional point of view due to inconsistencies between water law at the state level and water management at the entity level. Furthermore, large losses in water supply systems and a lot of illegal use of water occur. There is an insufficient number of wastewater treatment plants in the country. Moreover, often water is used in a wasteful way, e.g. drinking water is used for washing the streets.

Findings of the SWOT analysis:

Similar to waste management, the legal framework for water management is in existence, but not implemented sufficiently. This leads to a lot of old and damaged water supply pipe systems with substantial leakage. Also, regarding wastewater collection and treatment, there is a lack of infrastructure, and wastewater often gets released directly into the soil leading to a pollution of the groundwater. Improving the awareness of the public and repairing the water management systems with the help of EU funding would help Bosnia and Herzegovina to reduce the pollution issues and would increase the chance of becoming an EU member state.

6 Conclusions and outlook

This report covered on the one hand the consolidation of the reports 2.1 – 2.3 and on the other hand the workshop on climate-friendly and innovative solutions: current and future challenges, which was held in Vienna from May 31st to June 2nd 2023.

Report 2.1 focused on Western Balkan regional issues related to urban development. Different topics related to CSUDs have been analyzed for the countries Montenegro, Bosnia and Herzegovina and Albania. For Montenegro, the following current circumstances and objectives related to CSUD have been identified as crucial: A general lack of awareness for efficient use and sustainable disposal of natural resources prevails in the country. Therefore, the focus of measures should be set on energy efficient design of buildings, implementing a circular economy and establishing sustainable infrastructure for water and waste management and climate-friendly mobility. The complex administrative and political structure of Bosnia and Herzegovina impedes climate smart urban development. Therefore, all national plans need to be optimized in a way that the objectives can be reached efficiently and sustainably. In Albania, providing sustainable infrastructure for water, waste and climate-friendly transport is of top priority due to the massive urbanization movement including informal settlements.

Report 2.2 provided an overview of EU initiatives and policies related to urban development and climate change. Additionally, the implementation into national law as well as examples of best practices were listed for the EU Member States (+ Norway and Serbia). These examples should act as role models for Montenegro, Bosnia and Herzegovina and Albania in becoming EU Member States.

Report 2.3 focused on the analysis of existing curricula related to CSUD both in EU Member States and Montenegro, Bosnia and Herzegovina and Albania. The wider objective is to improve the quality of higher education all over western Balkan countries. Therefore, the report focused on identifying the gaps of BSc. and MSc. university courses between EU Member States and the three western Balkan countries in order to define the necessary change of curricula.

At the workshop in Vienna, the findings of the three reports 2.1 – 2.3 were presented. Moreover, the core program was a SWOT-analysis using the method of a World Café for four key issues in all three western Balkan countries. This helped to identify differences and synergies of CSUD in Montenegro, Bosnia and Herzegovina and Albania. The following topics were overlapping for all three western Balkan countries:

- The legal framework and guidelines are usually in existence, but the implementation of strategies and policies is often missing.
- Change to more sustainable forms of mobility and a reduction of car dependency.
- Improvement of infrastructure for water and waste management.
- Public awareness of sustainability should be increased.
- The protection of the environment should be prioritized.

All these topics should not only be realized in practice, but also be taught intensively at Western Balkan universities. The pathway to this aim will be addressed in detail in WP3 – Capacity building of WB HEIs.

List of Tables

Table 1: Evaluation of EU policies and initiatives.....	18
Table 2: Evaluation of national policies from several EU Member States (+ Norway and Serbia)	19
Table 3: Evaluation of best practices in several EU Member States (+ Norway and Serbia)	22
Table 4: Number of modules where the courses will be modernized for each university	25
Table 5: Summary of database about HEI in BSc and MSc study programs	27
Table 6: Comparison of curricula from group 2 with curricula from group 1 (BSc. study program)	28
Table 7: Comparison of curricula from group 2 with curricula from group 1 (MSc. study program) ...	29

List of Figures

Figure 1: Comparison of BSc. curricula from group 2 with curricula from group 1	28
Figure 2: Comparison of MSc. curricula from group 2 with curricula from group 1	29
Figure 3: Program of the workshop	32
Figure 4: Basic framework of a SWOT analysis	33