jOiNEd For sUsTainability - bUilding climate REsilient communities in WB and EU

SUSTAINABLE CONSTRUCTUINS WORKSHOP

Prof. dr Mirjana Laban
UNIVERSITY OF NOVI SAD, Novi Sad, Serbia

Date: 18 April 2024
Place: IUAV, Venezia

Co-funded by the European Union

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Workshop plan

- UNS COURSES PRESENTATION 11.30 – 11.45
- UoM COURSES PRESENTATIONS 11.45 – 12.00
- UTZ COURSES PRESENTATIONS 12.00 -12.15
- DISCUSION – COMPARATIVE ANALYSIS – IMPLEMENTATION OF SUSTAINABLE CONSTRUCTION TOPICS IN UoM AND UTZ CURICULUM 12.15 – 12.45
- CONCLUSIONS AND LITERATURE REVIEW 12.45 – 13.00

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UoM AND UTZ COURSES

Workshop Group 4
Construction
UNS UTZ UoM
Physical Hazards (UTZ)
Project Management (UOM)
Construction Company Management (UOM)
Risk management in the implementation of construction projects (UOM)
Construction Management (UOM)
Special chapters in construction management (UOM)
Maintenance, rehabilitation and reconstruction of buildings (UOM)

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Sustainable and Resilient Cities – UNS courses

UNS Study visit

University of Novi Sad (UNS)

Date: 04 December 2023
Place: Novi Sad

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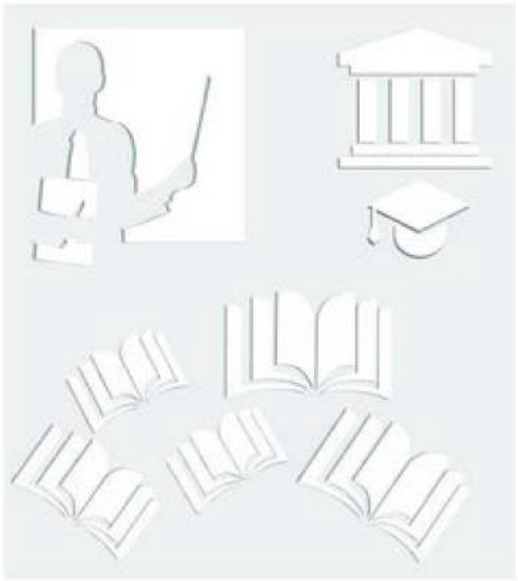
Undergraduate Academic Studies



Disaster Risk Management and Fire Safety

Disaster Risk Management and Fire Safety

General information

Type of studies
Undergraduate Academic Studies

Academic degree
Bachelor with Honours in Disaster Risk Management and Fire Safety (B.Dis.Ris.Managem.Fir.Saf.)

Educational field
Technical-Technological Science

Scientific, professional or art field
Environmental and Occupational Safety Engineering

Duration (year/sem)
4 / 8

Total ECTS
240

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Undergraduate Academic Studies / Disaster Risk Management and Fire Safety

Disaster Risk Management and Fire Safety

Year: 2, Semester: Summer

- Hazards
- Devices and Systems in Fire Protection
- Risk Management and Sustainable Settlements' Development
- Risks in Manipulating Hazardous Substances
- Applied Information Technologies

Interdisciplinary	yes
ECTS	7

Year: 3, Semester: Winter

- Fundamentals of Thermodynamics and Heat Transfer
- Elements of a Building and Installation
- Modeling and Simulation in Risk Management
- Institutional Frameworks in Risk Management
- Safety Aspects in the Built Environment

Interdisciplinary	yes
ECTS	7

Year: 4, Semester: Winter

- Disaster risk management cycle
- Flood Defence Measures
- Izborni predmet 7
- Izborni predmet 8
- Elective Course 6
- Professional Practice

Interdisciplinary	yes
ECTS	5

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Undergraduate Academic Studies / Disaster Risk Management and Fire Safety

Course: Risk Management and Sustainable Settlements' Development

Year: 2, Semester: Summer

Course specification

Basic informations | Educational goal | Educational outcomes | Course content | Teaching methods | Literature | Knowledge evaluation | Lecturers

Types of plan documents in urban and spatial planning. Current regulations in the field of spatial planning and urban design. Sustainable elements of the settlement development. Importance and development of towns through history. Urbanization as a process. Modern cities, their characteristics and problems. Functioning of the city systems. Sustainable development of the town. Modern approach to planning sustainable towns. Analysis of the incorporation possibilities, risk analysis within the existing law solutions. Risk identification and analysis in catastrophic events and fire in preparation of the plan documentation. Vulnerability concept. Analysis of the existing plans and consideration of the applied conceptual solutions from the aspect of prevention against catastrophic events and fire. Case studies – analysis of existing plan documents (of all levels) and analysis from the previous period.

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Course: Risk Management and Sustainable Settlements' Development

Year: 2, Semester: Summer

Course specification

Basic informations | Educational goal | Educational outcomes | Course content | Teaching methods | Literature

Knowledge evaluation | Lecturers

Course activity	Pre-examination	Obligations	Number of points
Test	Yes	Yes	30.00
Exercise attendance	Yes	Yes	5.00
Presentation	Yes	Yes	10.00
Lecture attendance	Yes	Yes	5.00
Term paper	Yes	Yes	20.00
Practical part of the exam - tasks	No	Yes	30.00

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Undergraduate Academic Studies / Disaster Risk Management and Fire Safety

Course: Safety Aspects in the Built Environment

Year: 3, Semester: Winter

Course specification

Basic informations | Educational goal | Educational outcomes | Course content | Teaching methods | Literature | Knowledge evaluation | Lecturers

Typology and classification of the construction materials and construction, planning and design of object, with an emphasis on architectural-civil engineering preventive measures of object safety in the conditions of catastrophic events and fire and behavior of construction materials and constructions in fire. Introduction to the basic elements of municipal system and their protection: hydrotechnical systems, water supply systems, drainage and treatment system, flood control system, infrastructure complexes, corridors and facilities, energy system, power supply, power distribution networks, heat supply system, heating systems, gas systems, telephone and cable distribution systems, undeveloped land, underground objects, subways, tunnels, pedestrian passes, underground garages. Case studies – event analysis from the previous period. Analysis of the planed objects – project documentation, analysis of the built objects and consideration of applied conceptual solutions from the aspect of protection against catastrophic events and fire.

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Undergraduate Academic Studies / Disaster Risk Management and Fire Safety

Course: Safety Aspects in the Built Environment

Course specification

Year: 3, Semester: Winter

Basic informations | Educational goal | Educational outcomes | Course content | Teaching methods | Literature

Knowledge evaluation | Lecturers

Course activity	Pre-examination	Obligations	Number of points
Test	Yes	Yes	30.00
Exercise attendance	Yes	Yes	5.00
Written part of the exam - tasks and theory	No	Yes	30.00
Presentation	Yes	Yes	10.00
Lecture attendance	Yes	Yes	5.00
Term paper	Yes	Yes	20.00

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UNIVERSITY OF NOVI SAD

FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6

Study Programme Accreditation

MASTER ACADEMIC STUDIES — Disaster Risk Management and Fire Safety

Table 5.1 Courses schedule by semester and year of study

Study programme: Disaster Risk Management and Fire Safety

No.	Course ID	Course name		S	Type	Status	Active lessons				Other classes	ECTS
							Lec	Pra	SRW	OTT		
FIRST YEAR												
1	17.ZP501	Integrated Natural Disaster Risk Management		1	TM	M	2	0	0	0	0	4
2	17.URZP62	Assessment of Damaged Structures		1	TM	M	2	2	0	0	0	4
3	17.ZP512	Protection and Rescue Plans		1	SA	M	2	2	0	0	0	3
4	17.URZP73	Organization of Construction Works in the Reconstruction of the Settlement		1	TM	M	2	0	0	0	0	4
5	17.ZPMI0	Elective Course 1 (select 1 out of 2)		1		EB	2	2	0	0	0	4
		17.URZP55	Fire and Explosion Protection due to Electricity	1	NS	E	2	2	0	0	0	4
		17.ZP506	Crisis Management	1	NS	E	2	2	0	0	0	4
6	17.ZPMI1	Elective Course 2 (select 1 out of 2)		1		EB	2	0-2	0	0	0	4
		17.ZP509	Fire and Explosion Investigation	1	SA	E	2	0	0	2	0	4
		17.URZP64	The Role of Media in Risk Reduction	1	NS	E	2	2	0	0	0	4
7	17.URZ504	Professional Practice		1	SA	M	0	0	0	0	6	4
8	17.ZP510	Risk Analysis in Decision Making Process		2	TM	M	3	2	0	0	0	5
9	17.ZPMI3	Elective Course 4 (select 1 out of 2)		2		EB	2	2	0	0	0	4
		17.ZP507	Design and Maintenance of Fire Suppression Systems	2	SA	E	2	2	0	0	0	4
		17.ZP511	Financial Resistance to Risks	2	TM	E	2	2	0	0	0	4
10	17.URZP74	Evacuation Calculation and Modelling		2	SA	M	2	0	0	0	0	3
11	17.URZP02	Study Research Work on theoretical basis of the master thesis		2	NS	M	0	0	12	0	0	15
12	17.URZP01	Master Thesis – Elaboration and Defence		2	SA	M	0	0	0	0	5	6
						Active lessons - total:	49					
											Total ECTS:	60

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Study Programme Accreditation

MASTER ACADEMIC STUDIES — Disaster Risk Management and Fire Safety

Table 5.2 Course specification

Course:		Assessment of Damaged Structures			
Course id:	URZP62				
Number of ECTS:	4				
Teacher:		Lukić M. Ivan			
Course status:		Mandatory			
Number of active teaching classes (weekly)					
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:	
2	2	0	0	0	
Precondition courses		None			

1. Educational goal:

Acquiring knowledge about basic types of structure damage after catastrophic events and fire, as well as about methodologies and methods for the assessment of the actual state and safety of the damaged structures.

2. Educational outcomes (acquired knowledge):

Acquired knowledge is used in professional courses and in engineering practice. The student is competent for the use of different non-destructive and destructive methods of examination, registration and classification of defects and damages, identification of the cause for the appearance, and for rough estimation of the state and safety of the structures after catastrophic events and fire.

3. Course content/structure:

Destructive and non-destructive methods of examination (equipment, procedures, application possibilities). Classification and manifestation of damage on the structures after catastrophic event (fire, earthquakes, explosions, floods, overload, etc.). Examination methodology and assessment of the structure. Technical regulations. Examples of examination and damage assessment of the structures.

4. Teaching methods:

Within lectures, presentations in the form of photographs, tables, diagrams, formulas and highlighted texts-definitions are used to explain the course content of the syllabus to the students. Short topic movies are also presented. Within laboratory practice, students can see and independently carry out non-destructive examinations. During auditory practice students are presented with different structures which were assessed with an objective to better understand methodology, data processing and methods of making conclusions. During the semester, part of the exam may be taken in the form of two colloquiums. The examination is oral.

Knowledge evaluation (maximum 100 points)					
Pre-examination obligations	Mandatory	Points	Final exam	Mandatory	Points
Complex exercises	Yes	20.00	Written part of the exam - tasks and theory	Yes	70.00
Exercise attendance	Yes	5.00	Coloquium exam	No	20.00
Lecture attendance	Yes	5.00	Coloquium exam	No	20.00

Literature

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UNIVERSITY OF NOVI SAD

FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6

Study Programme Accreditation

MASTER ACADEMIC STUDIES — Disaster Risk Management and Fire Safety

Table 5.2 Course specification

Course:		Protection and Rescue Plans
Course id:	ZP512	
Number of ECTS:	3	
Teacher:		Laban Đ. Mirjana
Course status:		Mandatory

Number of active teaching classes (weekly)

Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:
2	2	0	0	0

Precondition courses	None

1. Educational goal:

The course objective is to acquire necessary knowledge for protection and rescue of people under the circumstances of natural disasters, catastrophic events and fire.

2. Educational outcomes (acquired knowledge):

After the passed examination students will be able to identify and classify risks for inhabitants, vulnerability of people, and to formulate, define and plan protective measures for people rescue under the conditions of natural disasters, catastrophic events and fire.

3. Course content/structure:

Organization and the methods of alarming the people in case of natural disaster and natural catastrophe (earthquakes, floods, landslides). Technical-technological accidents (dangerous substances, terrorism) and bigger fires (in the open, in the facilities, on reservoirs of flammable liquids, on transportation vehicles, in industrial plants). Phenomena, concept and organization of the rescue of people, material goods and cultural property. Protective and rescue measures. Preventive measures. Needs and possibilities of the protection of people, material goods and environment from the consequences of catastrophic events. Protective facilities. Methodology of planning the needs for shelters. Maintenance of shelters. The concept and objective of people evacuation, place of evacuation, time of evacuation, elements of evacuation. Planning and designing the plans of evacuation. Rescue from the rubble. Power, means and equipment for the protection from rubble. Planning and protection from earthquakes and landslides. Planning the flood defense and rescue. Protective and rescue measures from natural disasters: wind, snow, hail, ionizing radiation, and chemical contamination. Protective and rescue measures from fire in the open space-wood fire. Protective and rescue equipment.

4. Teaching methods:

The course is held via auditory lectures accompanied by slides and auditory practice which further encourage solving certain problems. Both lectures and practice are followed by a great number of examples from the practice. Besides, it is planned that representatives from institutions and firms also give a lecture, and that students visit institutions and firms typical for the field of interest in the lecturing units.

Knowledge evaluation (maximum 100 points)

Pre-examination obligations	Mandatory	Points	Final exam	Mandatory	Points
Exercise attendance	Yes	5.00	Written part of the exam - tasks and theory	Yes	70.00
Lecture attendance	Yes	5.00			
Term paper	Yes	20.00			

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FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6

Study Programme Accreditation

MASTER ACADEMIC STUDIES — Disaster Risk Management and Fire Safety

Table 5.2 Course specification

Course:	Organization of Construction Works in the Reconstruction of the Settlement
Course id:	URZP73
Number of ECTS:	4
Teachers:	Trivunić R. Milan, Mučenski Lj. Vladimir, Peško N. Igor
Course status:	Mandatory

Number of active teaching classes (weekly)

Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:
2	0	2	0	0

Precondition courses	None

1. Educational goal:

Acquiring knowledge about the process of building and reconstruction of buildings and ways of organizing works.

2. Educational outcomes (acquired knowledge):

Ability to create global elaborates for the development of dynamic construction and reconstruction plans, defining measures for safe and healthy work. The acquired knowledge is directly applied in engineering practice.

3. Course content/structure:

The project of technology and construction organization. Construction conditions. The relationship between building technology and reconstruction and site organization. Schemes of the site organization. Measures for safe and healthy construction work. Construction organization and adopted technology. Methods of planning (network plan, gantogram). Processing plans on a computer.

4. Teaching methods:

Teaching is realized as lectures in the form of presentations on individual methodical units and graphic practice performed individually by students during the class and assisted by an assistant. In practice classes, based on the obtained information (lectures, literature, consultations and general introduction at the beginning of exercises) students solve the set tasks (graphic practice). All completed and positively graded papers are a prerequisite for taking the examination. Examination includes the entire course content presented during the semester, and it is in written and oral form. Written part of the examination can also be taken as two modules during the teaching process. Examination grade is formed on the basis of lecture and practice attendance, points from graphic papers, written and oral examination.

Knowledge evaluation (maximum 100 points)

Pre-examination obligations	Mandatory	Points	Final exam	Mandatory	Points
Graphic paper	Yes	20.00	Coloquium exam	No	20.00
Homework	Yes	5.00	Coloquium exam	No	20.00
Lecture attendance	Yes	5.00	Theoretical part of the exam	Yes	30.00
			Practical part of the exam - tasks	Yes	40.00

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FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6

Study Programme Accreditation

MASTER ACADEMIC STUDIES — Disaster Risk Management and Fire Safety

Table 5.2 Course specification

Course:		Financial Resistance to Risks			
Course id:	ZP511				
Number of ECTS:	4				
Teachers:		Mrkšić Lj. Dragan, Popović M. Ljiljana			
Course status:		Elective			
Number of active teaching classes (weekly)					
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:	
2	2	0	0	0	
Precondition courses		None			

1. Educational goal:

The objective of this course is to introduce students to basic economic instruments that contribute to reducing the socio-economic vulnerability of society to catastrophic events. Also, the objective of the course is that students acquire the competencies and knowledge necessary to improve the financial resilience of the society.

2. Educational outcomes (acquired knowledge):

Students gain competitions necessary to improve the financial resilience of societies. Students will be able to identify financial instruments for reducing the vulnerability of the society by analyzing potential capabilities of community and individuals.

3. Course content/structure:

Financial models of risk management are being studied in the context of preparedness of community for catastrophic events. Different financial instruments for risk management are analyzed and compared, prior to a catastrophic event (relocation of funds with the aim of preventing and mitigating damage) and after a catastrophic event (risk transfer for reconstruction and recovery of society).

4. Teaching methods:

Lectures and auditory practices.

Knowledge evaluation (maximum 100 points)

Pre-examination obligations	Mandatory	Points	Final exam	Mandatory	Points
Exercise attendance	Yes	5.00	Written part of the exam - tasks and theory	Yes	50.00
Lecture attendance	Yes	5.00			
Project	Yes	40.00			

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CIRCULAR ECONOMY TOPICS SHOULD BE INCLUDED IN COURSES INOVATION

QUESTION FOR MoU AND UTZ:
WHICH COURSES COULD BE INNOVATED BY CE TOPICS?

Workshop Group 4
Construction
UNS UTZ UoM
Physical Hazards (UTZ)
Project Management (UOM)
Construction Company Management (UOM)
Risk management in the implementation of construction projects (UOM)
Construction Management (UOM)
Special chapters in construction management (UOM)
Maintenance, rehabilitation and reconstruction of buildings (UOM)

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THE EUROPEAN GREEN DEAL

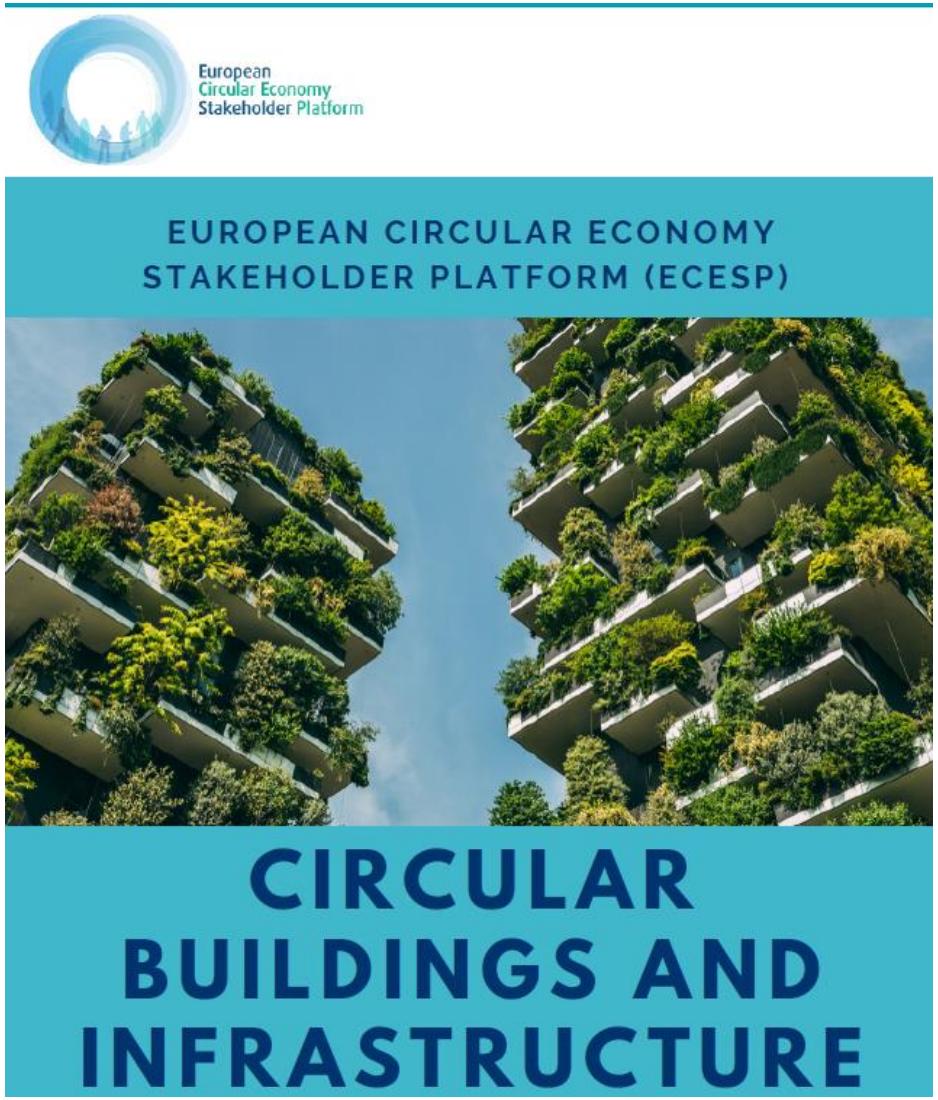
https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

Key figures:

- The first climate-neutral continent by 2050
- At least 55% less net greenhouse gas emissions by 2030, compared to 1990 levels
- 3 billion additional trees to be planted in the EU by 2030

European Climate Pact

https://climate-pact.europa.eu/index_en



https://circulareconomy.europa.eu/platform/en

Europe's state of the environment 2020:
change of direction urgently needed to face climate change challenges, reverse degradation and ensure future prosperity

https://www.eea.europa.eu/highlights/soer2020-europes-environment-state-and-outlook-report

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1FUTURE

UNIVERSITAS STUDIORUM NEAPOLITANA MCMLX

Social Climate Fund

Emissions trading for road transport and buildings

Carbon Border Adjustment Mechanism

EU Emissions Trading System – for power, industry, maritime & aviation

Land Use, Forestry and Agriculture Regulation

Energy Taxation Directive

EU Forest Strategy

2030 CLIMATE TARGETS

Energy Efficiency Directive

Effort Sharing Regulation

Renewable Energy Directive

Alternative Fuels Infrastructure Regulation

CO_2 emissions standards for cars and vans

FuelEU Maritime Initiative

ReFuelEU Aviation Initiative

EUROPEAN GREEN DEAL

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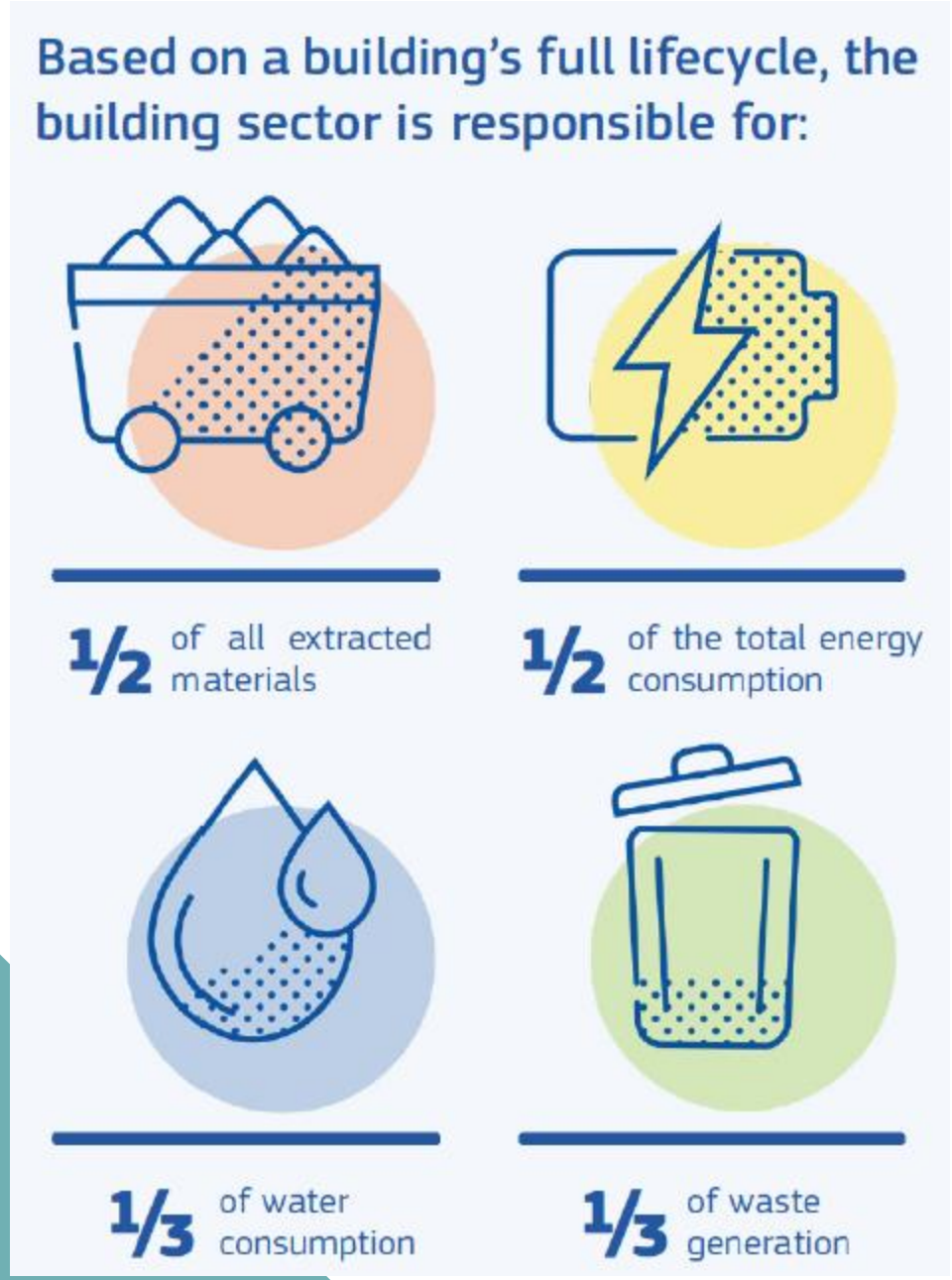
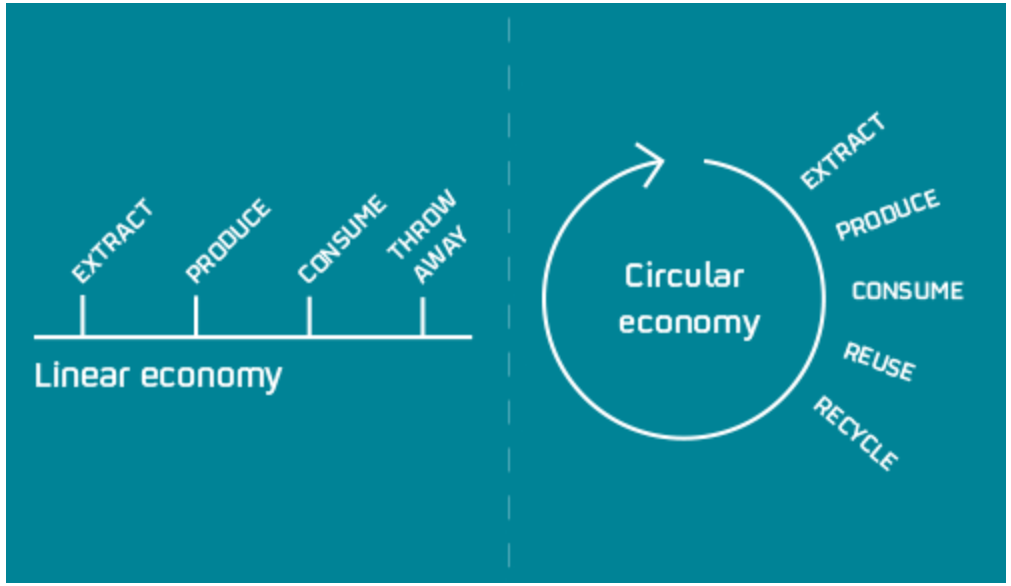
1FUTURE





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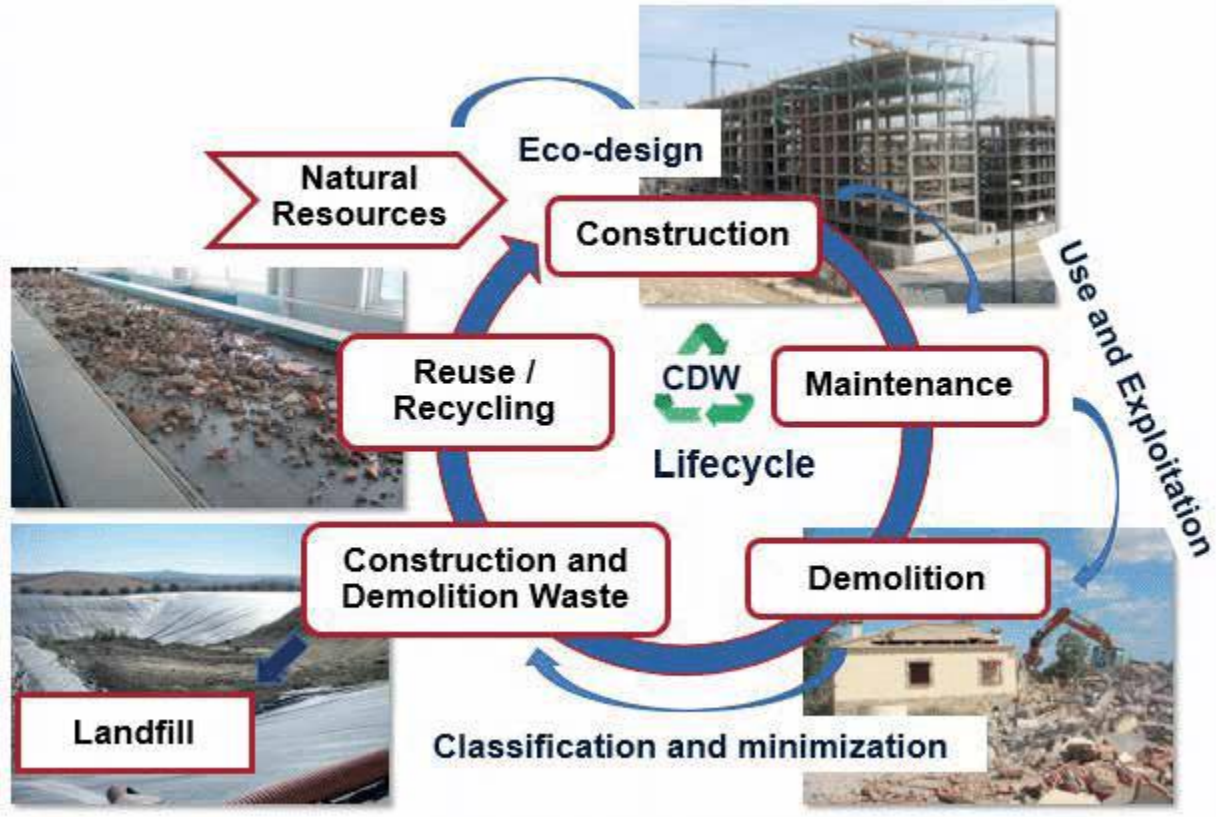
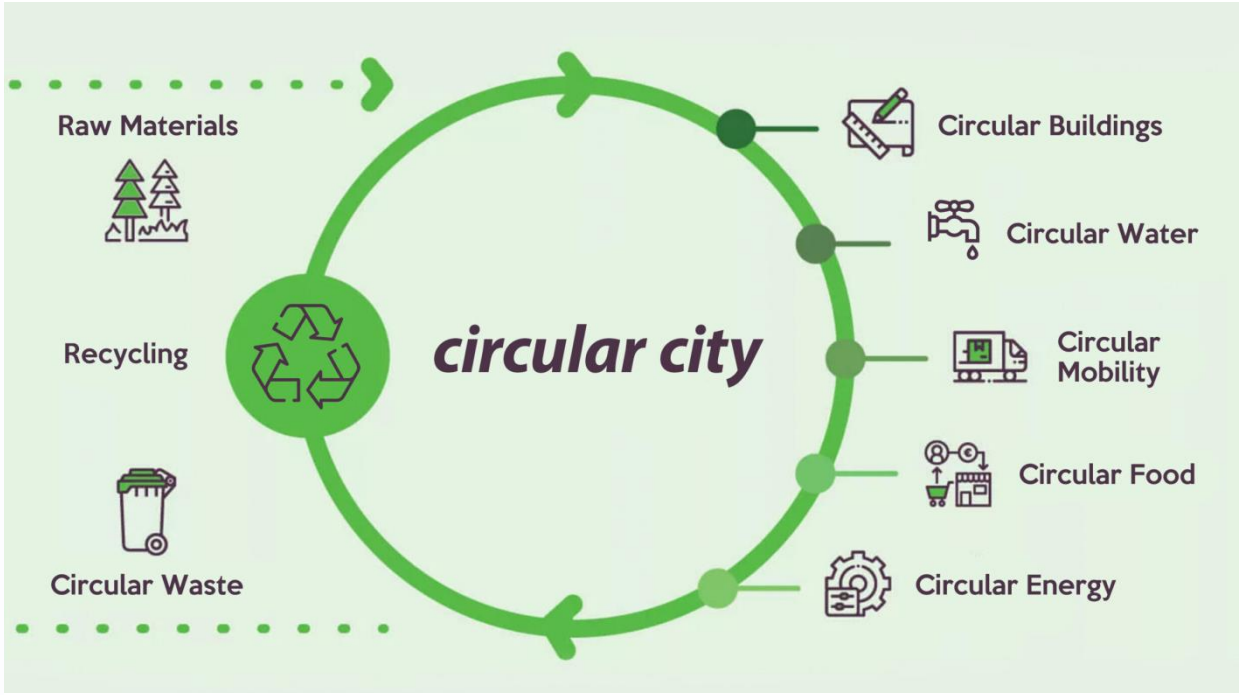
Circular Economy in Construction Industry





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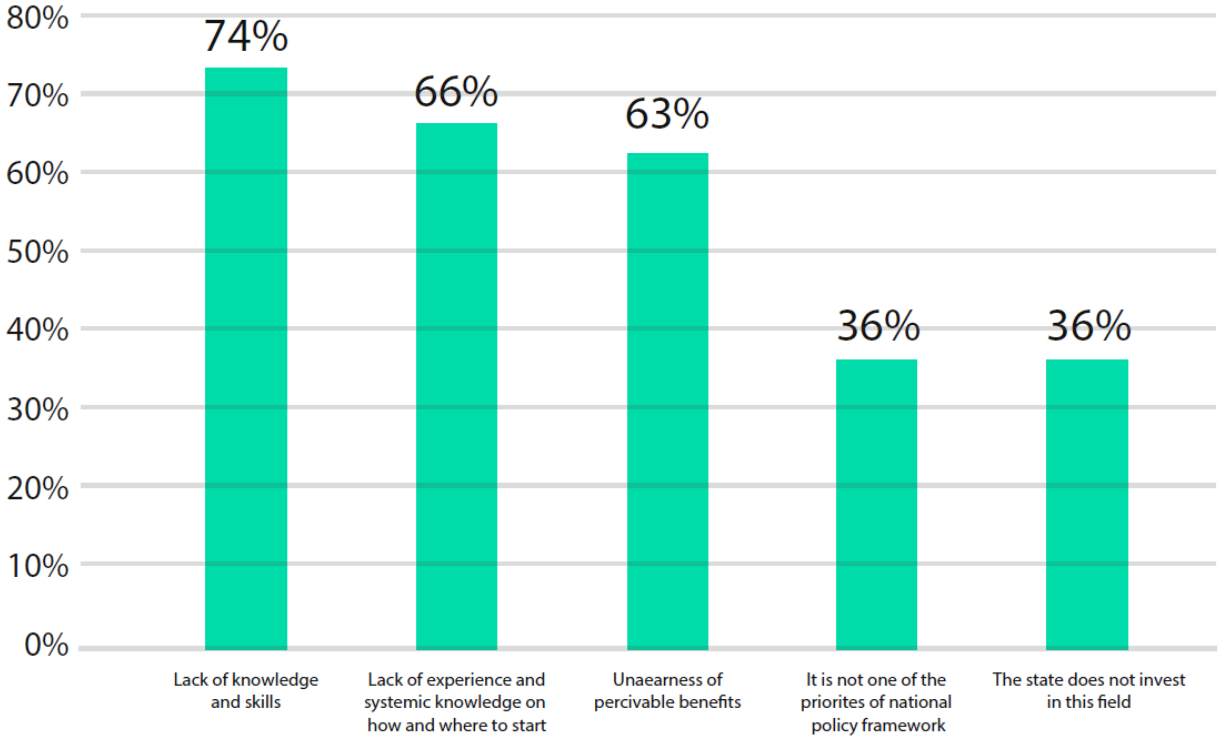
Summary Needs Assessment Report

WESTERN BALKAN COUNTRIES ON THE ROAD TO THE CIRCULAR ECONOMY

This report suggests an indicative pattern of needs of Western Balkan countries in Public Governance, Research and Innovation and Business. It may serve for strategic impact-driven portfolio planning of support actors and decision-makers.

Despite the different policy situations in all the countries, main barriers to implementing the circular economy are:

- lack of knowledge and skills
- unawareness of perceivable benefits
- lack of experience of where and how to start
- lack of multidisciplinary professions and skills



Main barriers to implementing circular economy in Western Balkan countries

Barriers to bringing new policies that anticipate circular economy in Western Balkan Countries

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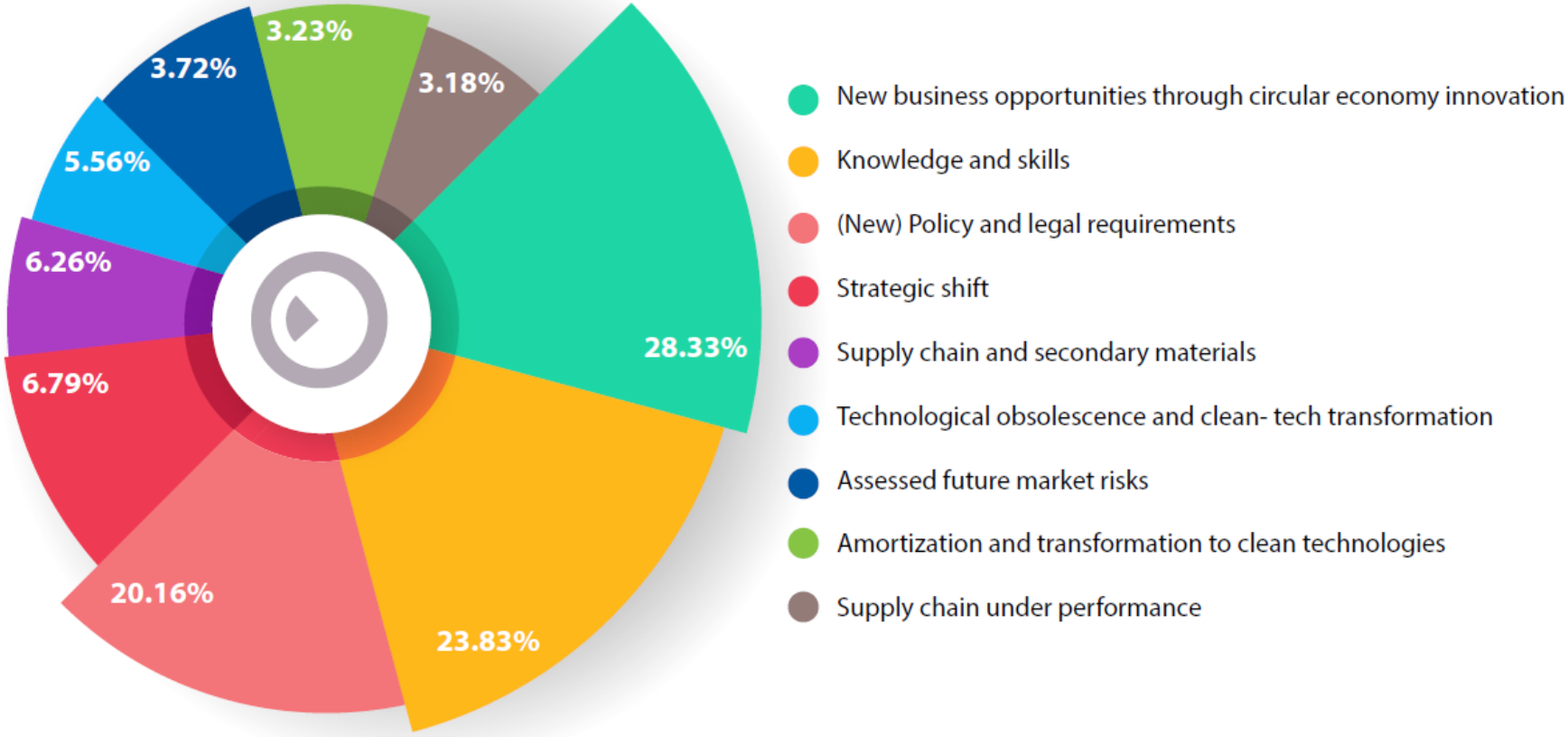
Biggest challenges in future development of companies in Western Balkans



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SOFIA DECLARATION ON THE GREEN AGENDA FOR THE WESTERN BALKANS (10 NOV 2020)

II. Circular economy

We commit to the process of transition from linear to a circular economy being fully aware of the necessity for research and innovation system to support this transition. With the aim to further contribute in this way to the environmental protection and minimization of the amount of waste generated in the region we envision the following actions:

- **Integrate the Western Balkans into the EU industrial supply chains by:**
  - Taking decisive action to improve the **sustainability of primary production of raw materials;**
  - Applying an **industrial ecosystem approach** to attain an environmentally sustainable, balanced economic recovery across the region, in particular for key future-proof industrial ecosystems such as renewable energy, digital, mobility; and resource-intensive industrial sectors such as tourism, textile, transport-automotive and energy-intensive industries;
- Develop **circular economy strategies** looking at the entire lifecycle of products, waste prevention, modern waste management and recycling, re-use, repair and re-manufacturing;
- Make further progress in constructing and maintenance of **waste management infrastructure** for cities and regions;
- Design and implement **consumer-targeted initiatives** raising awareness of citizens on waste, separate collection and sustainable consumption;
- Conclude and implement a **regional agreement on prevention of plastic pollution**, including specifically addressing the priority issue of marine litter;
- Further implement **Smart Specialisation Strategies**, place-based, innovation-led transformation agendas for sustainability.

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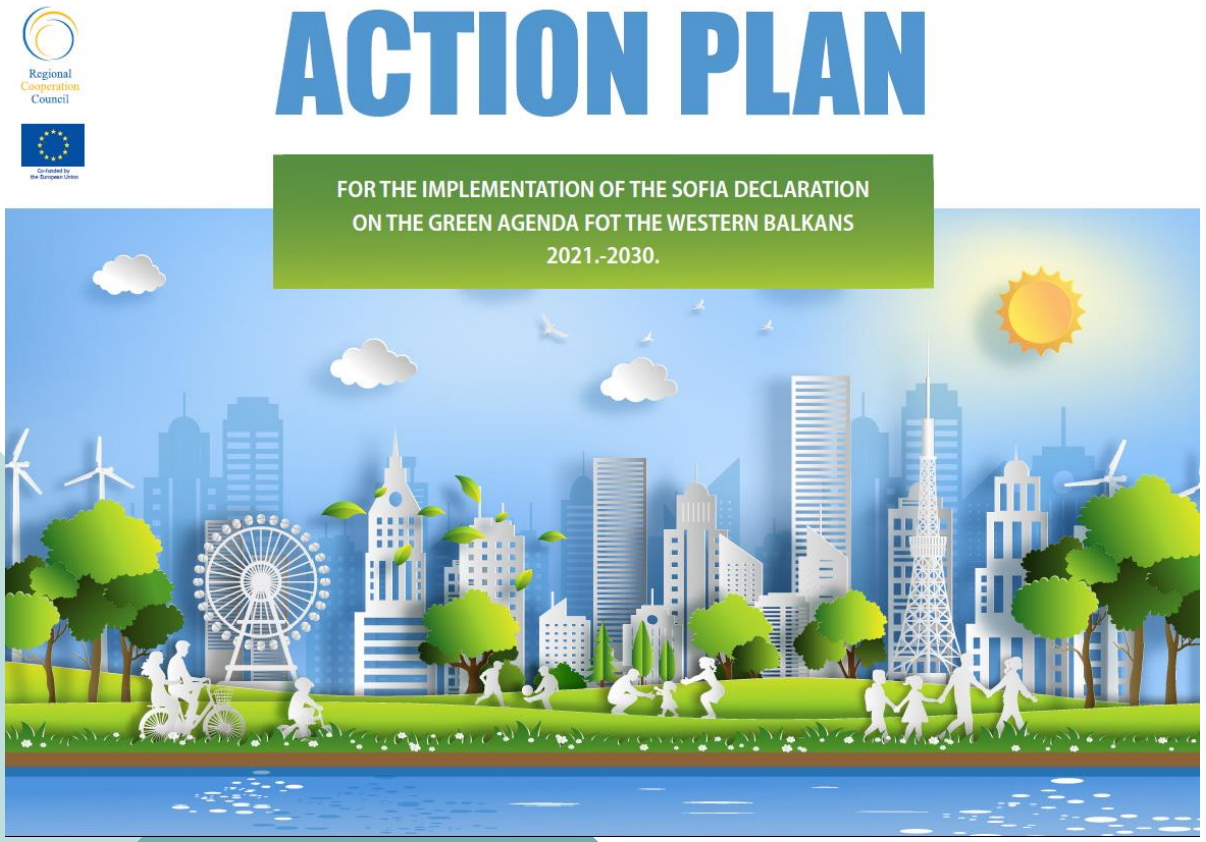
https://www.rcc.int/docs/596/action-plan-for-the-implementation-of-the-sofia-declaration-on-the-green-agenda-for-the-western-balkans-2021-2030



ALB

MNG

BH

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Thanks for the attention !

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