United Nations
Framework Convention on
Climate Change

NAMA Seeking Support for Implementation

University of Banja Luka
Faculty of Architecture, Civil Engineering and Geodesy
Bosnia and Herzegovina

CARBON FORUM ASIA Workshop / Macao

NAMA Project:

SUSTAINABLE AND ENERGY EFFICIENT BUILDING OF FACULTY OF ARCHITECTURE, CIVIL ENGINEERING AND GEODESY

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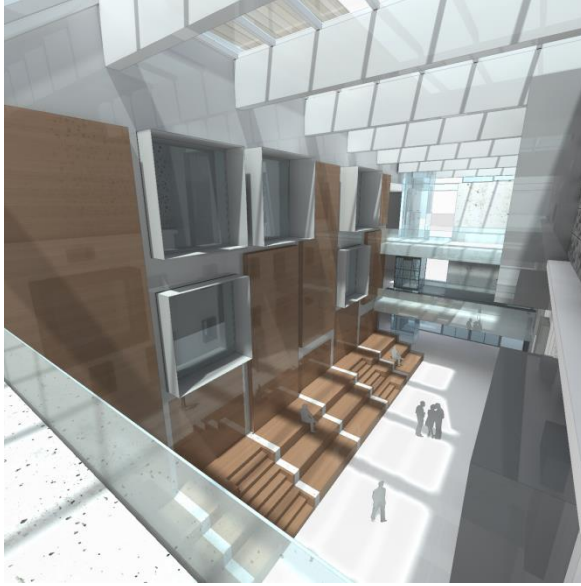
Brief context:

PROBLEM OF ENERGY EFFICIENCY OF BUILDINGS IN BOSNIA AND HERZEGOVINA AND POTENTIAL FOR MITIGATION ACTIONS

According to data from the **Draft of National Energy Efficiency Action Plan (NEEAP, 2012)**, buildings are responsible for the highest share of end consumption of energy in Bosnia and Herzegovina. Approximately this share is **60%** at the national level, but in some cities and municipalities it goes above **80%**. So, buildings are responsible for a major share of greenhouse gas emissions directly and indirectly through electricity consumption.

In the city of Banja Luka (second largest in the country) **90% of CO2 emissions comes from building sector**, while 10% comes from traffic sector. 80 - 90% of the energy in the exploitation phase of buildings goes to the basic conditions of living and working comfort in space, such as heating, cooling, ventilation, heating of water and lighting.

According to **Climate Change Adaptation and Low-Emission Development Strategy for Bosnia and Herzegovina** emission reduction in the building sector should therefore be considered as a key priority. The Banja Luka SEAP goal is to **reduce CO2 emission for 25% till 2025** by applying the appropriate norms and standards in the design and (re) construction of buildings.



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NAMA Objective:

The main objective of the project is to reduce GHG emissions from building sector and at the same time set a prototypical example for solving the problem of spatial and technological capacity for teaching and scientific research by designing and construction of environmentally friendly and energy efficient building of FACEG. The goal is to establish sustainable instrument for managing the energy of the building which will result in a reduction of CO2 emission by 50% compared to the CO2 emission of educational facilities with a typical spatial configuration and materialization in Banja Luka. **EXEMPLAR EDUCATIONAL FACILITY.**

Planned activities:

I. NAMA: Making NAMA project (Period: 2 months)

II. BUILDING: Construction works of the building – the second phase (Period: 24 months). Construction works are divided into four groups.

III. GREEN SOURANDING: Works on the construction of systems and devices of the collection, disposal and recycling of atmospheric, ground and sanitary wastewater around the building and surrounding green structures (*BlueGreenDream* principles). (Period: 6 months)

IV. MRV: Measuring, reporting and verification system (Period: after 1 year of building funcioning)

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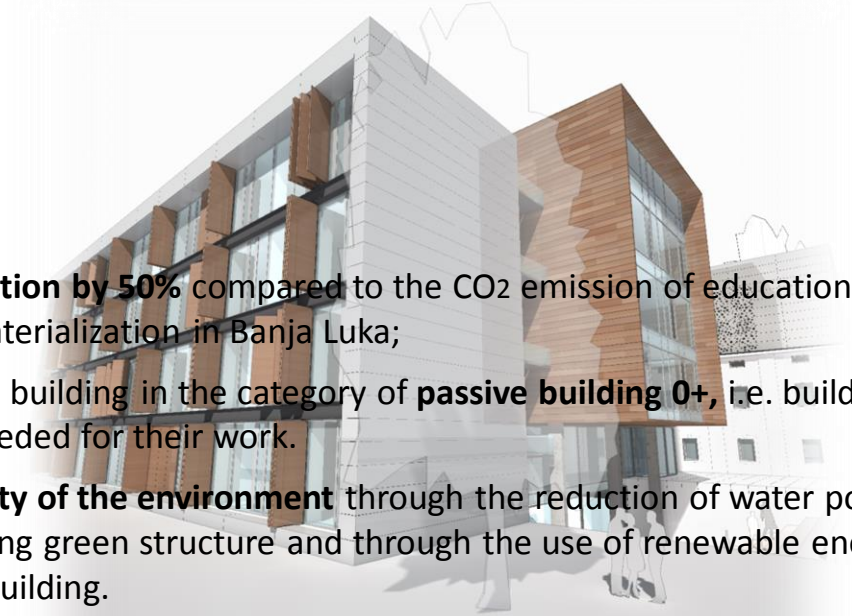

Planned targets:

- **CO_2 emission reduction by 50%** compared to the CO_2 emission of educational facilities of typical spatial configuration and materialization in Banja Luka;
- Construction of the building in the category of **passive building 0+,** i.e. buildings that are able to produce as much energy as is needed for their work.
- Improving the **quality of the environment** through the reduction of water pollution, maintenance and preservation of existing green structure and through the use of renewable energy sources for heating and cooling of air in the building.
- **Transfer of knowledge** and new technologies through application of the principles and infrastructure of energy efficiency in buildings.

Estimated GHG reductions:

Parameters	Building I (1915)		Building II (2007)		**Building III** (2015) FACEG	
	Before	After measures	Before	After measures	Before	After measures
CO_2 emission, kg/m² a	136,3	111,2	67,5	47,9	-	**11**
CO_2 emission, t/y	376,6	307	102,9	72,9	-	**74,6**
CO_2 emission, t/y **Eq. to size of FACEG building**	-	757,4	-	326,2	-	**74,6**
CO_2 emission, MtCO_2e/y	-	687	-	296		**67,1**
Emission savings, MtCO_2e/y	-	619	-	**228**	-	-
Emission savings, %	-	90	-	**77**	-	-

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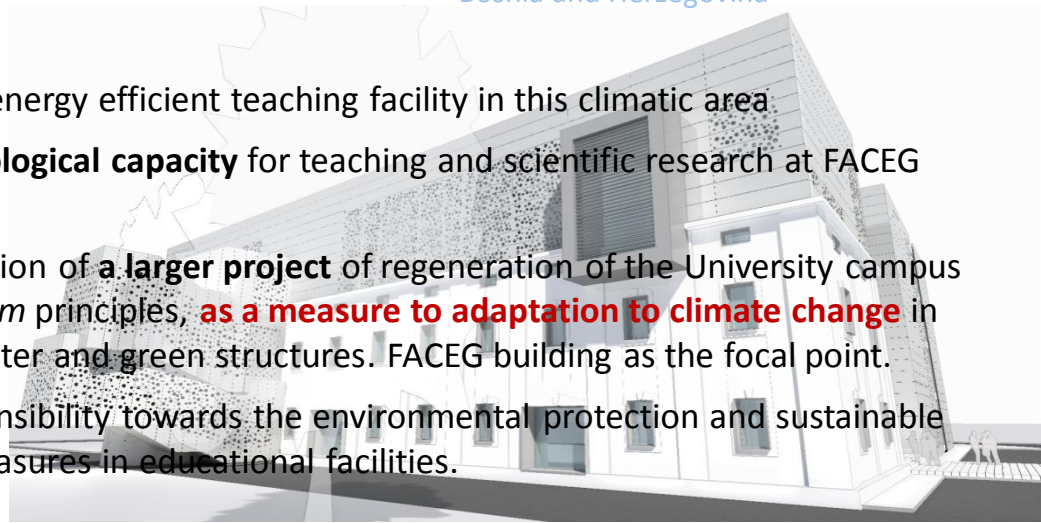
Co-benefits:

-A set model for environmentally friendly and energy efficient teaching facility in this climatic area

- Significant improvement of **spatial and technological capacity** for teaching and scientific research at FACEG and University of Banja Luka;

- **Initiation** of the conceptualization and realization of **a larger project** of regeneration of the University campus and the waterside, according to *BlueGreenDream* principles, **as a measure to adaptation to climate change** in urban systems by exploiting the synergies of water and green structures. FACEG building as the focal point.

- **Increase of citizens' awareness** on their responsibility towards the environmental protection and sustainable use of energy, by applying energy efficiency measures in educational facilities.



Institutional arrangements and MRV plan:

	ACTORS	Activities and financial responsibility	TIME
1.	**UBL** University of Banja Luka	Construction land (owner)	
		Existing facility "Teresa" (owner)	
		Preparation of tender documents	
2.	**FACEG** Faculty of Architecture, Civil Engineering and Geodesy	Preliminary design	
		Elaborate on geomechanical investigations	
		Urban and technical requirements	
		Location permit	
		The main project	
		Exploratory drilling and geothermal works	
		Elaborate on harmful ionising radiation	
3.	**GRS** Republic of Srpska Government	A study on the feasibility, energy efficiency and transfer of knowledge and technology	
		Building permit	
		1st phase of the building construction	
4.	**MSDCEE** Ministry of Spatial Development, Civil Engineering and Ecology	**NAMA application approval**	3 months
5.	**NAMA** support **FACEG**	End of the building construction, Ecological systems and devices around the building and surrounding green structures.	24 months 6 months
6.	**MSDCEE** **Independent body** **FACEG, NAMA** donors	**MRV system** Measurement of energy and environmental parameters Reporting and Verification	After 1 year of building functioning

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Financial needs:

	Activities	BAM	EURO	$
	Already invested	5 706 771,89	2 926 549,68	**3 099 110,90**
	FIRST PHASE - Construction of the building			
1.	I group – prirority one	641 312,91	328 878,41	
2.	I group – priority two	2 542 568,23	1 303 881,14	
3.	I group – priority three	1 901 652,83	975 206,57	
4.	II group	2 669 958,83	1 369 209,65	
5.	III group	3 404 734,26	1 746 017,56	
6.	IV group	1 317 222,00	675 498,46	
7.	MRV	456 622,44	234 165,35	
	TOTAL	12 934 071,50	6 632 857,17	**7 023 958,00**
8.	**SECOND PHASE** Construction of systems and devices of the collection, disposal and recycling of atmospheric, ground and sanitary wastewater around the building and surrounding green structures.	4 655 000,00	2 387 179,48	2 527 937,00
	TOTAL	17 589 071,50	9 020 036,66	**9 551 895,00**

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