GREEN ECONOMIC DEVELOPMENT (GED)

PROJECT

MID-TERM REVIEW REPORT

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Acronyms and Abbreviations

B&H	Bosnia & Herzegovina
CO	UNDP Country Office
CO_2	Carbon Dioxide
EMIS	Energy Management Information System
EPBD	Energy performance in buildings directive
EU	European Union
FA	Focal Area
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GDP	Gross Domestic Product
GED	Green economic development
GHG	Greenhouse Gases
KfW	German Development Bank
kW	Kilowatt
kWh	Kilowatt-hour
M&E	Monitoring and Evaluation
MWe	Megawatt Electrical
MWh	Megawatt-hour (million watt-hours)
MTR	Mid-Term Review
NGO	Non-governmental Organization
OECD	Organization for Economic Cooperation and Development
PM	Project Manager
PMU	Project Management Unit
ProDoc	Project document
RES	Renewable Energy Sources
SDG	UN Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SMEs	Small and Medium-sized Enterprises
ToR	Terms of Reference
tCO_2	Tonne of Carbon Dioxide
toe	Tons of Oil Equivalent
WB	World Bank

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1. Executive Summary

1.1. Project Description

1. This UNDP-implemented Project, which is supported financially by SIDA as well as various sources of national and public co-financing, seeks to achieve green economic development through energy savings and avoided greenhouse gas (GHG) emissions by focusing on institutional capacity building, raising awareness and creating market demand for energy efficiency services as well as on improving policy and legislative framework related to energy performance in public buildings.

2. The overall objective of the Project is to create a favourable environment resulting in economic and local development through reallocation of public budget funds (from energy/water expenses to investments in education, health, infrastructure, culture and further energy efficiency projects etc.) and generation of employment, the identification and adoption of EE financial mechanisms to support the public sector in its energy conservation activities.

3. The Project evolved from early UNDP awareness raising activities during 2010 – 2013, into institutionalization of a systematic approach to energy management in public buildings after 2013 when SIDA also started supporting the Project since 2015.

4. Now the Project aims to create favourable environment for investment into EE. The Project addresses the aspects required to assure long-term project's goals sustainability. The strategy is built around five interlinked and complementing Project components:

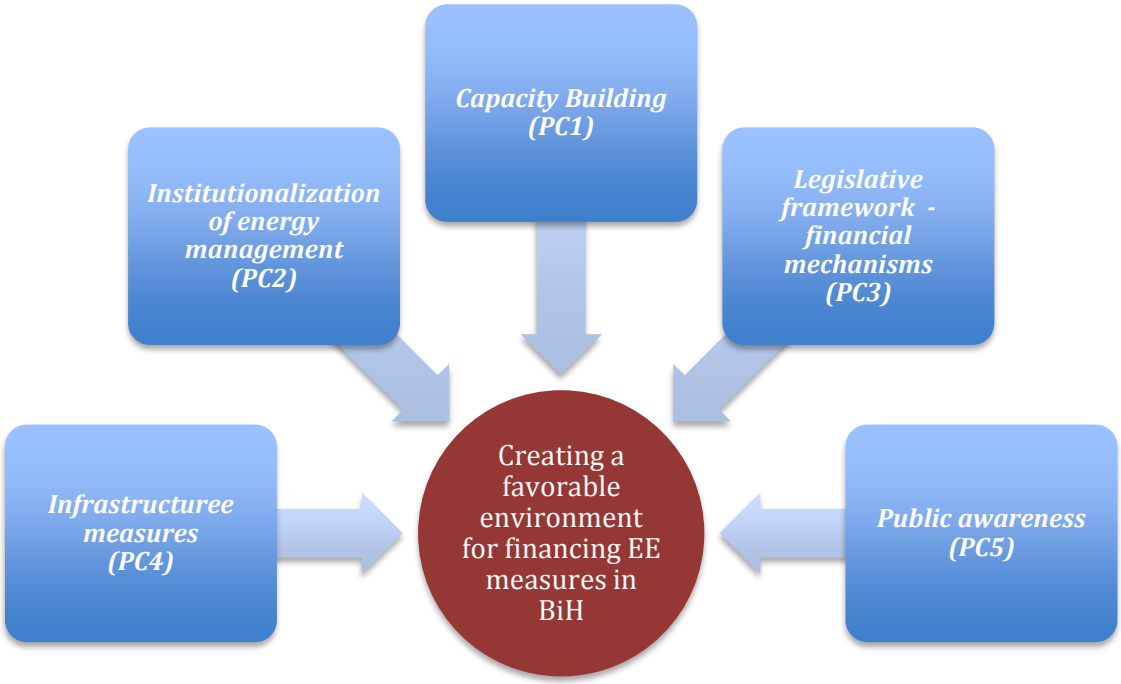
   I. ***Capacity Building (PC1)*** – Development and capacity building of Environmental Funds and energy professionals.

   II. ***Institutionalization of energy management (PC2)*** – Institutionalization of energy, costs and emission management and monitoring in public sector buildings of BiH.

III. ***Legislative framework / financial mechanisms (PC3)*** – Development and adoption of sustainable financial mechanisms within Environmental Protection Funds.

IV. ***Infrastructure measures (PC4)*** – Implementation of energy efficiency measures in public buildings.

V. ***Public awareness / marketing campaign (PC5)*** – increasing public awareness on energy efficiency



1.2. MTR Ratings & Achievement Summary Table

Project Strategy	Midterm Level & Assess-ment	Achieve-ment Rating
OBJECTIVE: to create a favorable environment for investing in EE infrastructure measures in BiH.		**S**
Outcome 1: To develop capacity and strengthen skills of Environmental Fund staff and energy professionals		**HS**
Outcome 2: To develop capacity and strengthen skills of energy professionals		**S**
Outcome 3: To establish energy monitoring and reporting mechanisms in BiH		**HS**
Outcome 4: To enable financing for EE infrastructure projects in BiH		**HS**
Outcome 5: To increase general public's understanding of EE benefits		**S**
OVERAL RATING		**HS**

Indicator Assessment Key	Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

HS – Highly Satisfactory; S - Satisfactory; MS - Moderately Satisfactory;

MU - Moderately Unsatisfactory

1.3. Summary of project contribution to SDGs

Relevant SDG sub-goals and indicators	GED Project contribution
SDG 1: Poverty reduction	
Sub-goal 1.1.1: Population below the international poverty line, by employment status	Decrease by at least 123 people (as a result of new employment).
Indicator 1.a.2: Proportion of government spending on essential services (education, health and social protection)	Increase by at least 0,1%
SDG 3: Health and SDG 4 Education	
Sub-goal 3c: Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing	Health financing increased by 1-5% compared to average national level (per patient/per year)

States	
Sub-goal 4a: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	62 schools and kindergartens with improved thermal comfort and lighting systems
SDG 5 Gender empowerment	
Sub-goal 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	224 (50%) women acquired new technical skills and knowledge to enable their active and equal participation in the economic life
Sub-goal 5.b: Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	1,800 (60%) women trained on use of EMIS
SDG 7 Energy access	
Indicator 7.1.2: Population with primary reliance on clean fuels and technology	15,567 end-users of public buildings relying on clean fuels (biomass) for heating
Sub-goal 7.3: By 2030, double the global rate of improvement in energy efficiency	Improved energy efficiency of public buildings from over 220 kWh/m2 down to 86 kWh/m2, by over 50%
SDG 8 Prosperity and Jobs	
Sub-goal 8.5: By 2030, achieve full and productive employment and decent work for all women and men	538 FTE jobs or 6,467 man-months created by the project
SDG 13 Climate Change	
Sub-goal 13.2 Integrate climate change measures into national policies, strategies and planning	5 energy efficiency action plans developed and adopted by regional/local authorities
Indicator: 13.2.1: GHG emission reduction over investment life-cycle (tCO2)	5,854 tCO2e/year or 146,350 tCO2e over investment lifetime
Indicator 13.2.2: Cost-effectiveness of GHG emission reduction	38 USD/tCO2e

1.4. Concise summary of conclusions

5. Overall impressions of project results achieved so far based on the documentary review, interviews with project stakeholders and site visits are positive. Project team is well structured and effective, the project interventions covered all geographical areas of BiH, the quality of work on visited site is good, and building users are satisfied with the improvements achieved, comfort levels increased and energy costs reduced.

6. Project has achieved or surpassed all targets which in itself is a reason for high

ratings, but what is also important to emphasize is that the project's counterparts in Federation, RS and Kantons are also satisfied with joint work on the projects which they are co-financing.

7. Moreover, Kanton Sarajevo and Municipality of Teslić are already making plans to expand their activities beyond the scope of jointly financed project. This is an important result of all the Project components in changing perception of local authorities toward importance of EE in public buildings and it is a cornerstone for project sustainability.

8. EE Fund in Federation has introduced new financial mechanisms and EE Fund in RS is going to follow soon. Public awareness activities are changing perception of general public towards energy, as well as decision makers on the local level. They do demonstrate understanding of needs for proper EE planning and are increasingly ready to co-finance and finance implementation of EE projects.

9. It can therefore be concluded that project has successfully initiated EE market transformation for public buildings and that it is on a strong path of achieving sustainability through further actions over the next 2-3 years.

10. The project has made tangible contribution to a number of SDGs, including to poverty reduction (SDG1), improvement of health (SDG 3) and education (SDG4), gender empowerment (SDG5), access to sustainable energy (SDG 7) and fight against climate change (SDG 13).

11. The concept note for the next phase GED activities was reviewed as well and it addresses the important aspects for the follow up activities. Some comments are provided in the MTR and summarized in the recommendation section.

1.5. Recommendation Summary Table

Rec #	Recommendation
A	**Outcome 1**
A.1	*Supporting Energy performance certificates (EPC):* EPC are gaining acceptance and certification process is going to expand. In order to provide support for relevant Ministries for monitoring the process and assuring quality of accredited certificators work, EMIS should be extended with a module which supports related calculations for preparation EPC in an objective, transparent and comparable manner.
B	**Outcome 2**
B.1	*Universal acceptance:* Project should aim to achieve universal acceptance of EMIS as a tool for fostering EE in public buildings across both entities and all cantons, as well as on the state level.
B.2	*EMIS upgrade:* EMIS platform is already of a mature age and requires upgrade both in terms of user-friendliness and functionality. The graphical user interface has to be upgrade in line with current similar products standards (GIS aspects, google map, satellite images of cites and buildings, interactive dashboard, etc.). In terms of functionally, an

building energy intensity mapping feature should be added. Once all public buildings are entered in the data base, these feature will allow immediate colour coded insight into energy efficiency of individual buildings

B.3 *Adding Street lighting:* Street lighting efficiency improvement is very important for municipalities because publuc lighiting accounts for signficant part of municipal budgets. In this respect, it is important to note that from a safety perspective, light from LED fixtures can be aimed and controlled to eliminate the dark spots and shadows that are common with more traditional metal halide or high pressure sodium street lights. Also, modern solar LED street light may incorporate a small but high definition cameras which are important tools for increasing safety on less frequented roads, car parking's and parks, thus contributing to people's safety, and particular women security. Therefore, we recommend introduction of this new component into the project scope.

Therefore it is recommended to add street lighting module to EMIS.

C Outcome 3

C.1 *Performance-based granting*: consider introduction of performance-based granting modality in lieu of "classic" upfront grant-making scheme.

C.2 Consequently, EMIS should be upgraded with a monitoring and verification module, which will provide unbiased report on energy savings achieved.

D Outcome 4

D.1 *Enlarging scope of retrofit projects:* line with the EU EPBD directive which requires that every new public building from the year 2018 has to be of Net Zero Energy Building Standard (NZEB), retrofit project should include appropriate RES measures and integrate them with EE measure aiming at achieve nearly NZEB standard

D.2 *Extending coverage:* In line with universal acceptance, Project should aim to spread retrofit project across all entities and cantons.

E Outcome 5

E.1 *Projects Fact Sheets*: Prepare and make publicly available information about investment projects in the form of simple fact sheets containing key information about achieved results, as well as visual (like "before and after" pictures)

E.2 Integrate in the scope of communication strategy and plan impact monitoring, in terms of improved awareness and behavioural changes among various targeted categories. In particular, the focus on monitoring changes in awareness and motivation among investment decision-makers could be additionally assessed and monitored

E.3 Put more emphasis on communicating sustainable development impacts of EE investment (i.e. those which go beyond budgetary and energy saving), in particular such aspects as improved comfort and occupancy conditions for building users, health and education impacts of such investment, as well as gender dimension (see also recommendations from the gender section)

2. Introduction

12. This report summarizes the findings of the Mid-Term Review (MTR) process for the UNDP-SIDA financed project entitled "Green Economic Development" (herein referred to as the "Project"). The Midterm Review Missions for the Project were fielded to Sarajevo, Nova Bila, Teslić and Banja Luka. The midterm review timeframe of this report is August - September 2017. The MTR covers the project implementation period from January 2015 till July 2017.

2.1. Purpose of the MTR and objectives

13. The purpose of the mid-term review (MTR) for this Project was to assess the progress towards attainment of project objectives and outcomes, capture lessons learned and suggest recommendations on major improvements. The MTR serves as an agent of change and plays a critical role in supporting accountability.

14. Key issues to be addressed by this MTR include:
    - Project progress to date;
    - Effectiveness in achieving project objectives and outcomes
    - Sustainability of Project interventions
    - Contribution to socio-economic development, including gender equality and poverty reduction,
    - Communication and outreach.

2.2. MTR methodology and scope

15. The MTR Team has developed a methodology for execution of MTR in accordance with the Guidance for Conducting Midterm Reviews of UNDP Projects[1], according to which the MTR among others shall include a review of:
    - Project strategy (Project design, Project planning matrix, use of SMART[2] indicators and targets);
    - Progress towards the Project objective and outcomes;
    - Project implementation and adaptive management;
    - Sustainability

16. In addition. MTR team has taken into considerations additional guidance and advice received from SIDA, one of the main project donors, namely the need to assess project effectiveness, put more emphasis on socio-economic and gender dimensions, as well as various aspects related to communication, outreach and visibility.

17. In order to prepare draft inception report and elaborate detailed mission programme, just after the signing the contract, the MTR team has established close working relations with the Project manager and UNDP CO Sector Leader. From them the MTR team has got initial information (out of that one included into the MTR ToR) on the Project as well as Project-related materials available

[1] http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance_Midterm%20Review%20_EN_2014.pdf

[2] Specific, Measurable, Achievable, Relevant and Time-Bound

in the electronic format. The team also has developed approach for the MTR, which is based on the clear understanding of the task and ways of its addressing. The main elements of the applied approach were as follows:

- The scope of the MTR to cover the entire Project and its components for the period of the Project implementation from January 2015 to August 2017.
- The MTR to be based on the analysis of Project-related documents as well as the evidenced information from different sources, which shall be cross-checked against the consistency.
- In order to use the mission period effectively the interviews of the stakeholders to be thoroughly prepared in order to better understand the sustainable energy policy priorities in B&H, overall environment in which the project was being implemented, status of the stakeholders' involvement, prospects scaling-up including future financing opportunities, etc.
- During the field visits along with the status of the pilot projects: checking of level of engagement of local municipalities, end-users and various impacts of the project on the local level.

18. The methodology of triangulation of information and data was used, thus requiring verification of at least three sources of information: perception, validation and documentation, and validated the information through cross-referencing of data sources. Mainly four sources of primary data and information has been examined:

    ✓ A wide variety of documents (Project Documents / UNDP Documents, see Annex 2) covering project design, implementation progress, monitoring, amongst others:

        a. PRODOC;
        b. Minutes of Project Board (PB) meetings etc.,
        c. The Project Document, project reports including Annual Project Review, project budget revisions, technical reports produced during the project implementation.
        d. National strategic and legal documents

    ✓ Face-to-face consultations with a wide range of stakeholders, using "semi-structured interviews" with a key set of questions in a conversational format during the mission to BiH (August 14 - 18, 2017) had discussions with many project stakeholders (see Annex 1 – Agenda of MTR mission). Triangulation of results, i.e. comparing information from different sources, such as documentation and interviews, or interviews on the same subject with different stakeholders, has been used to corroborate or check the reliability of evidence.
    ✓ Direct observations of project results and activities at selected field sites.
    ✓ Access to Energy management information system (EMIS)

19. The project's "Strategic Results Framework" provides a set of mid-term targets

for each of its Outcomes. For the review, the MTR team compared the results achieved to date with these targets, as well as with the end-of-project results that are expected to be achieved in 2.5 years from the time of the MTR.

20. The limitations of the evaluation methodology are mostly related to the limited time available for the interviews. Over 20 stakeholders were interviewed in total. The site visits were selected however in a way to represent a broad spectrum of project stakeholders and beneficiaries. The evaluation was completed over a period of 30 work days, including 5 days of field work, starting August 14, 2017.

21. Based on the above mentioned it is the MTR team's opinion that the information obtained during the MTR and included in this report is credible and reliable.

22. The scope of the MTR covers the entire project and its components as well as the co-financed components of the project with a particular emphasis on SIDA co-financed components. The MTR assesses Project implementation taking into account the status of Project activities, outputs and the resource disbursements made up to September 2017. The MTR also reports on the progress against the objective, each outcome, output, activity (including sub-activities) and impact indicators listed in the Project document. The MTR report concludes with recommendations, as appropriate, for the key stakeholders of the project. In addition to descriptive assessment, the achievements of targets were assessed on the following rating scale: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), and Unsatisfactory US). Sustainability was ranked along the following scale: Likely (L); Moderately Likely (ML); Moderately unlikely (MU), and Unlikely (U).

2.3. Structure of the Mid-Term Review Report

23. This MTR report is structured according to the MTR ToR, which in turn is compliant with the Guidance for Conducting Midterm Reviews of UNDP-Supported, Projects. The report consists of four main parts and annexes:

- ✓ ***Chapter 2 presents MTR methodology***
- ✓ ***Chapter 3 describes the project and strategy***
- ✓ ***Chapter 4 presents the Findings***, organized along 6 dimensions:

  Project Results

  Project Implementation

  Effectiveness

  Socio-economic impacts, including gender

  Communication, outreach and visibility

  Sustainability
- ✓ ***Chapter 5 presents Conclusions and Recommendations***

- ✓ ***Annexes – MTR ToR, Mission agenda, List of persons interviewed, list of documents reviewed, GHG emission reduction estimates, and other background technical data and information.***

3. Project Description and Strategy

3.1. Project background

24. The energy sector in BiH is organized in accordance to the General Framework Agreement for Peace in Bosnia and Herzegovina, positioning entity line ministries as the key players in the EE / RES framework while giving the state-wide level, represented by the Ministry of Foreign Trade and Economic Relations (MOFTER), a coordinating/reporting role for multilateral binding agreements. As such, the direct implementation of EE / RES related activities and EU acquis (such as achieving energy saving targets, energy monitoring, enforcements of legislations, financing mechanisms etc.) is to be carried out on the entity/cantonal levels. At this time Bosnia and Herzegovina has no official Energy Policy or Strategy and is not in the position to purposefully absorb or allocate required funds for EE investments. As of now, development and capacity building projects to meet BiH's EE / RES EU accession obligations focused solely on the state level while the involvement of entity and cantonal level authorities has been limited, resulting in limited success of EE/RES projects.

25. Due to stated facts, due to limited and therefore relatively slow state-level planning processes, the complexity of state-entity interactions and the country's administrative divisions and responsibilities, this situation analysis argues that further enforcement of energy efficiency / renewable energy in BiH should focus on a bottom-up (local-ministries/canton/entity-state) rather than top-down (state-ministries/canton/entity-local) approach while creating MVR, market and financial EE / RES mechanisms in Bosnia and Herzegovina. This would contribute to faster the creation of an environment attractive for EE /RES investments in the public and residential sector, generation of new employment and would result in the creation of clear energy monitoring and target achieving mechanisms within the country.

3.2. Problems to be addressed and the project strategy

26. The most of the energy in Bosnia and Herzegovina is consumed within the public and residential building sector – about 55% of total final energy consumption. The rest is consumed by the industry, service and transportation sector. The energy characteristic of public and residential sector is described as very energy-intensive due to high energy inefficiency. The average public building in BiH is consuming 220 kWh/m2 for thermal heating purposes, while the average residential building consumes 180 kWh/m2 . Both are categorizing them as completely energy inefficient buildings with strong energy conservation potential. Moreover, about 90% of the current BiH building stock does not meet the current technical standards in BiH. Due to its inefficiency, the average public building in Bosnia and Herzegovina can achieve an energy

consumption reduction of up to 60% with investments resulting in a rather short pay-back period (up to six years). However, a systematic approach and allocation of investments into energy efficiency and the utilization of renewables is missing.

27. There are several factors influencing the present energy (in)efficiency situation in BiH – however, the two most damping forces are the current energy prices (primarily for residential buildings) and the lack of binding legislative commitment factors within the energy efficiency / renewable energy primary and secondary legislation (primarily for public buildings). Namely, the energy pricing policy in BiH is not market driven but politically influenced and reflected though social-cross subsidizing resulting in one of the lowest energy price markets in the region and Europe. There are no emission taxes for fossil fuels, electricity generated to large extent from fossil fuels is often used for heating purposes and district heating services are usually paid on a fix-term basis while consumption based billing is very rare. These facts do not contribute to a motivating environment to invest in energy efficiency and renewable energy sources in the residential sector by the general public. On the other hand, the public sector should lead by example the increasing of energy efficiency and utilization of renewable energy processes in the country and communicate its benefits to the wider audience.

28. However, in the absence of clear legislation framework, strategy and action plans, as well as reporting and monitoring mechanisms, which all together shall enable an investing environment, a systematic and comprehensive undertaking to increase energy efficiency and utilize renewables in the public sector in BiH will not occur! Moreover, one major concern is that, once adopted, the primary and secondary legislation framework drafted for FBiH and RS will not be implementable due to lack of human and technical resources, lack of understanding and planning on various authority/government levels, as well as fragmented energy related cost covering jurisdictions (and therefore responsibilities) of public buildings throughout BiH. Since the legislation on EE / RES is only partially drafted and has not been fully adjusted to BiH context during the drafting stage, once adopted (Law on EE adopted in RS, in FBiH to be adopted by the end of 2014), an additional concern is that it will not be ready for implementation and will require additional interventions by line Ministries. The most challenging and basic issue to address energy efficiency and utilization of renewable energy in BiH public buildings is however the non-existing data and overview of current public building stock. Namely, due to the fragmented and complex inter-authority jurisdictions, especially in FBiH, authorities and line ministries do not possess a clear overview (in most cases even amount) of public buildings under their jurisdiction, not to mention energy and water related consumption and the costs they bear on a monthly basis.

29. Due to omission of lower level governments during and after EE / RES legislation drafting, due to the fragmented jurisdiction of different types of public buildings and not present communication and knowledge and information sharing on expected obligations and actions which will be required to be undertaken, it is highly recommended that further EE / RES activities

focus on a bottom-up approach in order to be in the position to achieve and communicate energy savings while creating sustainable energy monitoring and reporting mechanisms on entity and state level in BiH and an systematic approach to decision making process on energy efficiency and renewables. This would highly contribute to BiH obligations under the Energy Community Treaty.

30. Therefore the intentions of GED Project activities are to:
    - develop and adopt sustainable financial mechanisms within Environmental Protection Funds for EE project financing (performance based granting, revolving mechanisms, soft-loans, guarantees etc.),
    - achieve budget cost savings through implementation of EE projects in public sector buildings,
    - reinvest savings into energy efficiency or other infrastructure projects,
    - to generate employment of domestic workforce, and
    - increase awareness and understanding on EE benefits and proof that energy efficiency investments are economically and financially attractive and cost-effective in BiH.

31. The Project strategy was built around five components:

Project Component 1

32. ***Technical assistance – Environmental Protection Funds capacity building:*** UNDP staff providing technical assistance to the Environmental Protection Fund in the field of energy efficiency, energy management and management of EMIS, in the form of consultative, advisory and technical support, as well as hiring consultants for niche expertise/knowledge.

33. ***Developing and strengthening the technical and economic capacity of energy experts in BiH :*** Developing and strengthening the capacity of energy experts, and create understanding of the legislative framework in FBiH/RS/BiH on EU directives in the field of energy efficiency and energy management. Improvement of techno-economic skills necessary to perform energy audits and making bankable documents will be made through the realization of capacity building activities via training programs and the establishment of the Association of Energy Professionals in BiH. Project

34. ***Implementation of detailed energy audits for public sector buildings:*** Based on the collected energy, economic and emission data through EMIS, and the resulting indicators, a techno-economic prioritization will be conducted and about 100 buildings during project implementation will be chosen to conduct detailed energy audits. Capacity building and skills development of Funds internal capacities on energy efficiency investments decision making processes will be ensured through these evaluation, analysis and prioritization activities.

Project Component 2

35. ***Implementation of Energy Management Information System in 5.000 public***

buildings in BiH : UNDP BiH and the Environmental Protection Funds in joint activities will contribute to the implementation of Energy Management Information System (EMIS) in more than 5.000 public buildings in BiH (3.000 in FBiH and 2.000 in RS).

36. ***Training and capacity development for end-users on EMIS, energy efficiency and energy management :*** Training for end-users on EMIS, energy efficiency / energy management in public buildings for 5.000 identified public sector buildings end users.

37. ***Preparation of energy efficiency baseline Study for public sector buildings:*** The baseline Study on the energy efficiency of public buildings in BiH is complementary to the implementation of EMIS. The study complements EMIS in terms of investment calculations of energy efficiency measures and their environmental effects. Using the methodology of "walk-through audits", 500 buildings per year in FBiH will be processed and analysed through a single Study that in addition of individual assessment for each facility will provide an analysis of all the buildings together, according to the type and sector (educational institutions, health care, etc.). This baseline Studies will be used as baseline data for EE Action Plans.

Project Component 3

38. ***Drafting legislative documents and development of financial mechanisms for energy efficiency financing within Environmental Funds:*** Drafting legislative and guidance documents on financing energy efficiency in BiH includes the creation of guideline documents and secondary legislation, in order to create a sustainable financial model for the establishment of financial mechanisms for energy efficiency financing within Environmental Protection Funds. The financial mechanisms will include revolving mechanisms, performance based granting, soft loans, guarantees and other financial modalities which could be provided by the Environmental Funds with the aim to create a legal framework for sustainable investments and reinvesting possibilities in energy efficiency.

Project Component 4

39. ***Implementation of infrastructural energy efficiency measures in public sector buildings:*** On the basis of detailed energy audits findings, infrastructure measures will be implemented in up to five public sector buildings per year in order to conduct so called "Deep retrofits" (in accordance with the requirements of EU directives EED and EPBD) and respecting newly developed and adopted construction and energy conservation standards (EPBD directive).

Project Component 5

40. ***Raising public awareness in the field of energy efficiency, energy management and reduction of emissions to air:*** A comprehensive marketing campaign including TV spots, radio jingles and social network will be developed and implemented through the Programme duration. Raising public awareness events in 15 BiH cities are planned to be conducted. Designing,

printing and distribution of educational publications that explain EE from the basics to the technical details related to energy savings, energy management and emission reduction. Publications would be intended for a wider audience - from young people, who are first confronted with these issues, to professionals working in the energy sector. In addition, the development of an informative web portal on energy efficiency, energy management and reducing air emissions will be conducted.

41. Out of five GED Project Components (PC) SIDA'a involvement in the GED project contributes and creates add-value on *Capacity building* (PC 1), *Infrastructure EE measures* (PC 4) and *Public awareness* (PC 5) components (marked orange in Figure 1).

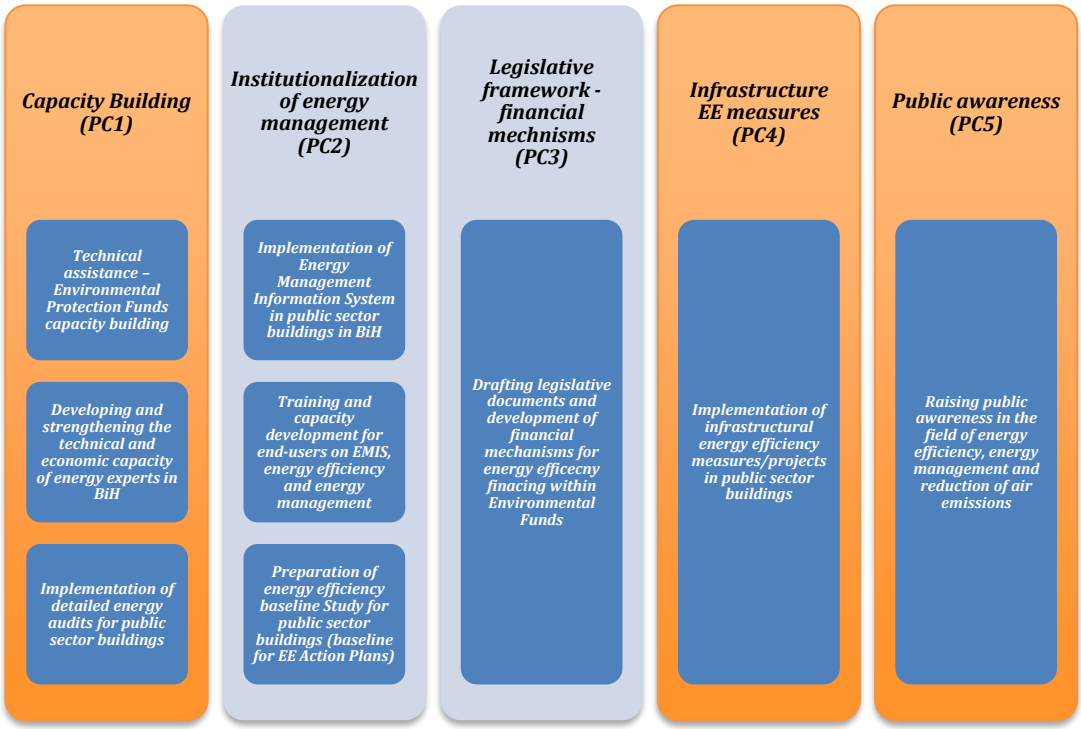


Figure 1 – Overview of identified potential for SWEDEN's involvement

42. From an EE financing perspective, SIDAs participation in the project accelerated Environmental Protection and Energy Efficiency Fund's shifting process from "grant financing of EE projects" to "loans provided to end-users for EE projects" and "risk minimized/guarantees provided" within the public (and potentially private) sector in BiH, as well as risks mitigated and awareness created for commercial financial institutions (Figure 2).

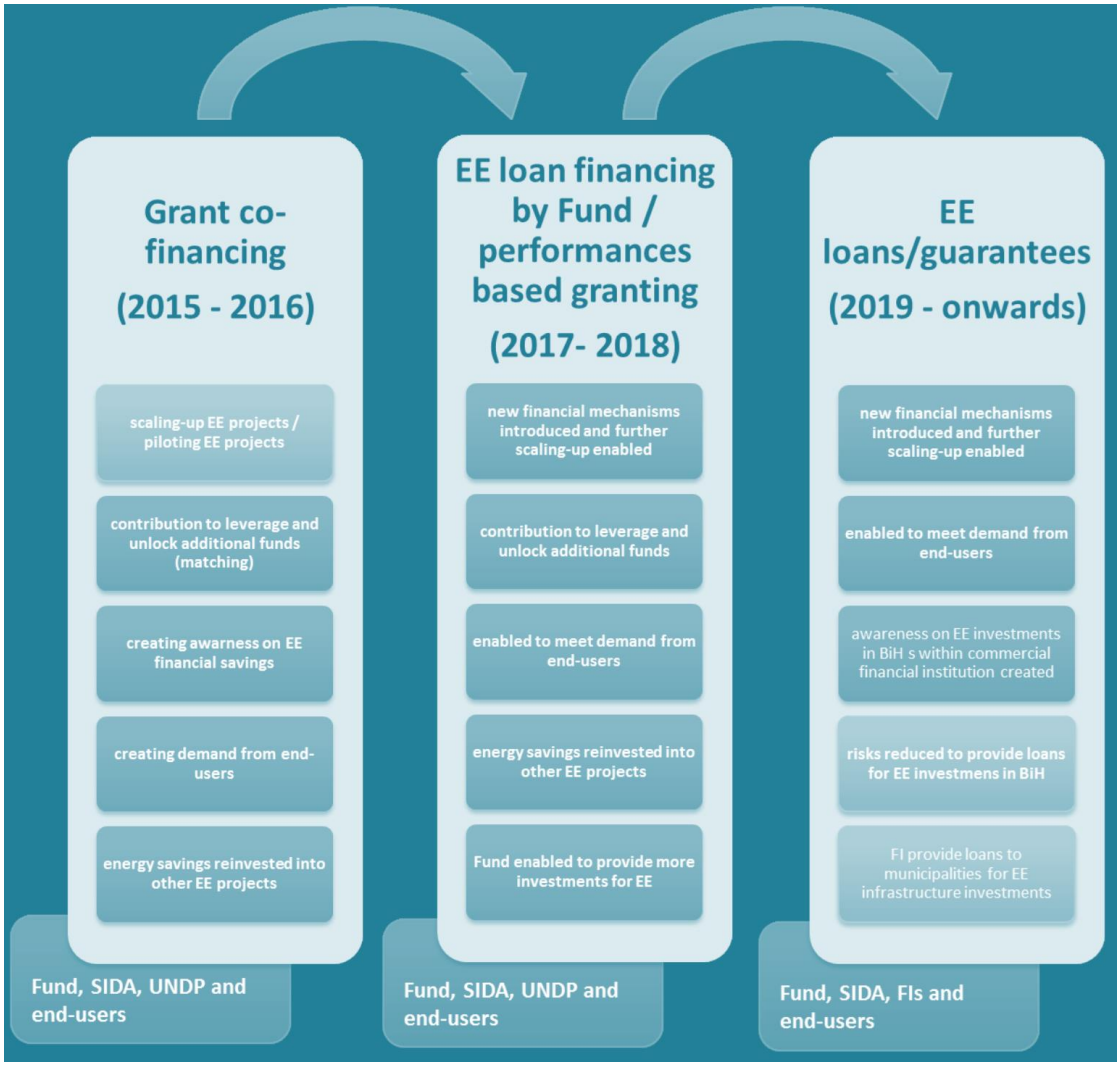


Figure 2 Progression of development of financing models

4. MTR Findings

4.1. Progress towards achieving intended results

43. Overall impressions of project results achieved so far based on the documentary review, interviews with project stakeholders and site visits are positive. Project team is well structured and effective, the project interventions covered all geographical areas of BiH, the quality of work on visited site is good, and building users are satisfied with the improvements achieved, comfort levels increased and energy costs reduced.

44. Project has achieved or surpassed all targets which in itself is a reason for high ratings, but what is also important to emphasize is that the project's counterparts in Federation, RS and Kantons are also satisfied with joint work on the projects which they are co-financing.

45. Moreover, Kanton Sarajevo and Municipality of Teslić are already making plans to expand their activities beyond the scope of jointly financed project. This is an important result for the Project in changing perception of local authorities toward EE in public buildings and it is a cornerstone for project sustainability.

46. Furthermore Ministry of Spatial planning in Federation sees the project as the key support and enabler for achieving commitments toward transpositions of EU - EPDB requirements. Of particular importance for the Ministry is the building stock register as being established within EMIS. Soon all the public buildings in Federation will be included in EMIS and this will present powerful tool for EE policy making for building sector.

47. EE Fund in Federation sees the project support as essential in enabling them to move from grant financing to loan based financing. They value particularly support for preparation of necessary acts, and EMIS as a logistic support for selecting projects for financing and for monitoring results of implemented projects.

48. The Ministry of Spatial planning and EE fund in RS share the views of their counterparts in the Federation. They are considering various options for IT support for overall EE program implementation, i.e. not only in buildings, but as of building sector EMIS is the key tool for their program implementation.

49. Project has established good cooperation with the related World Bank EE projects, particularly in the RS. There is also good cooperation with USAID project EIA, and with GIZ. The UNDP and GIZ activities have a number of common points, but apparently there is an agreement on division of work in order to avoid overlaps.

50. GED Project has also collaborated well with UNDP-implemented Biomass Market Promotion project (funded by the Czech Development Agency). Through this collaboration a number of investments featuring both EE and RE/fuel switch (biomass) measures in public buildings have been supported

demonstrating practical benefits of "low-energy" buildings, as well as environmental, social and economic feasibility of integrated EE-RE solutions.

51. Project conducted extensive communication and outreach campaign regarding energy efficiency targeting a wide range of stakeholders.

52. Brief account of the results by individual project components and related ratings are provided below. An overview of consolidated outcomes, indicators, targets and results is provided at the end of section.

4.1.1. Outcome 1

53. This project component is directly supported by SIDA.

54. UNDP staff provided technical assistance to the Environmental Protection Fund in the field of EE, energy management and management of EMIS in the form of consultative, advisory and technical support, as well as by hiring consultants to carry on specific tasks and assignments and address specific knowledge gaps in the Fund.

55. During annual capacity development training for Environmental Fund of the FbiH there were 4 participants and for the EF RS - 3 participants. The training programme for skill and knowledge development of energy professionals held in four cities of FbiH (Bihac, Sarajevo, Tuzla and Mostar) and two in RS (Banja Luka and Trebinje). Professional sessions were held in two groups in each city, based on professional orientation. Total number of training participants was 556.

56. The rating for achieving the target of Outcome 1 is Highly Satisfactory (HS) - seeTable 1 for assessment of progress under Project Component 1.

Table 1 Assessment of progress: Project Component 1

Indicator	Baseline	End-of-project target 2018	Progress at mid-term review 2015-2016	Rating
Outcome 1				
1.1 Number of detailed energy audits assessed and prioritized for funding	0	140	>300	HS
1.2 Number of energy professionals participating on training programme for skills and knowledge development	0	500	556	HS
Outputs				
1.1. Number of detailed energy audits conducted	0	140	>300	HS
1.2 Number of investment decisions made based on evaluation of detailed energy audits	0	85	64	S
1.3 Number of Fund staff (FBiH and RS each) participating on		10	Data n/a	

annual capacity development training on energy efficiency, EMIS and EE policy			
1.4 Number of Fund staff (FBiH and RS each) actively working on EMIS/EE investment decision making process cycle, monitoring, assessing and evaluating energy indicator	5	7	HS
1.5 Number of energy professionals participated on training programme for skills and knowledge development	500	556	HS
1.6 Number of female energy professionals participated on training programme for skills and knowledge development	150	224	HS
1.7 Change of in-depth understanding of energy efficiency and renewable techniques and technology, ability to conduct detailed energy audits with "deep-retrofitting" measures – measured using baseline and post CB questionnaires (qualitative)	Moderate-to-high in-depth understanding and ability	Moderate-to-high in-depth understanding and ability	HS
1.8 Number of members of BiH Association of Energy Professionals	25	>200	HS

Indicator Assessment Key	Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

4.1.2. Outcome 2

57. Maintaining an information system for energy consumption monitoring and reporting is a legal obligation for all public buildings. EMIS (Energy Management Informational System) is web based tool which serves this purpose and presents database of public sector buildings and their energy consumption. Decisions on obligatory data entry into EMIS database are adopted in 5 cantons. Una-Sana Canton Government was the first one to establish reporting mechanism in December 2014. Afterwards, West-Herzegovina Canton Government adopted Decision on 22.10.2015., Canton 10 adopted Decision on 05.11.2015. Bosnian Podrinje Canton adopted Decision on 14.07.2016. and Sarajevo Canton on 25.08.2016. Only buildings with regularly entered data are qualified to be chosen for energy audits and/or infrastructure works under the Project interventions. Total number of public sector buildings monitored through EMIS database is 4.114. (Statistics on

29.03.2017).

58. By the 29.03.2017, there were 1.518 participants on EMIS trainings. It should be noted that there are cases where one person from a public institution is in charge for more than one building. Total number of public buildings with trained active EMIS users is 2,999.

59. The baseline Study on the energy efficiency of public buildings in BiH was also prepared. It is complementary to the implementation of EMIS in a sense of providing investment calculations of energy efficiency measures and their environmental effects. 550 public sector buildings in FBiH have been processed and analysed in the study during the 2016.

60. The rating for achieving the target of Outcome 2 is Satisfactory (S). Please refer to Table 2 for assessment of individual outputs under Project Component 2.

Table 2 Assessment of progress: Project Component 2

Indicator	Baseline	End-of-project target 2018	Progress at mid-term review 2015-2016	Rating
Outcome 2				
2.1 Number of sub-national authorities with reporting mechanisms in place (target value: 7 – e.g. 5 cantons in FBiH, 2 ministries in RS).	0	7	5	S
Outputs				
2.1. Number of public sector buildings monitored through EMIS database	1,000	5,000	4,114	HS
2.2. Number of end-users trained on EMIS	1,000	5,000	2,999	S
2.3. Number of EEAPs developed and adopted by sub-national authorities (target value: 7 – e.g. 5 cantons in FBiH, 2 ministries in RS)	0	7	5	S

Indicator Assessment Key	Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

4.1.3. Outcome 3

61. UNDP is engaged with EE Fund in Federation since 2014 consciously supporting its capacity buildings and development of financial mechanisms aiming to reduce grant based financing and introduce revolving fund for EE project financing (Figure 3).

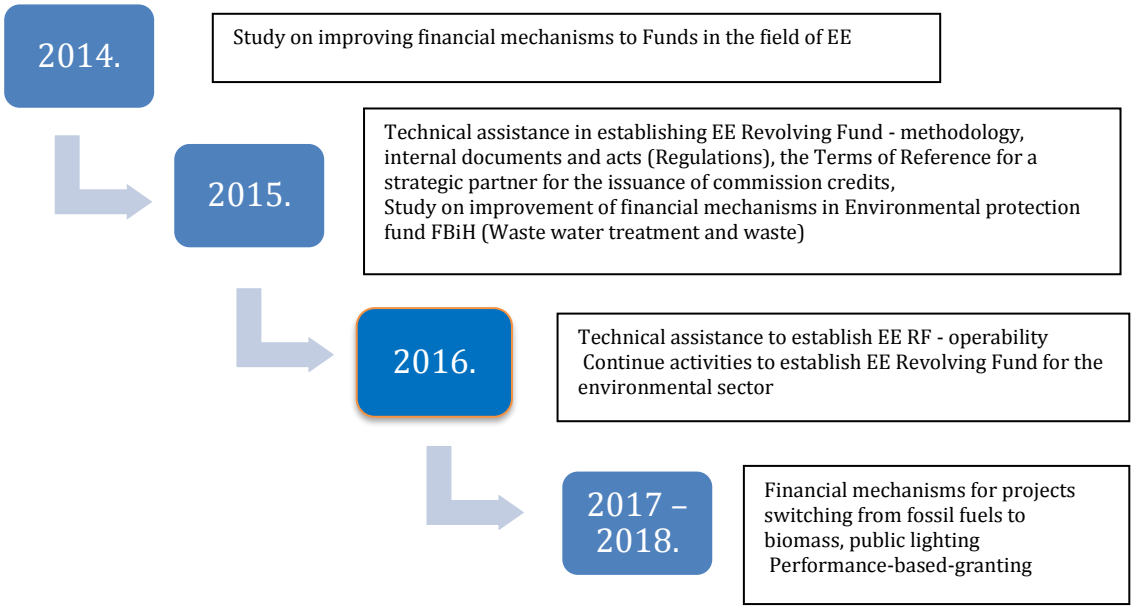


Figure 3. Evolution of financial mechanisms at the EE Fund in Federation

62. Since studies on financial mechanisms and viability of same were prepared by UNDP, Environmental Fund of FBIH entered agreement with Union bank d.d. Sarajevo on establishing Revolving fund for financing energy efficiency projects. The first public call for financing projects though the Revolving fund on energy efficiency was announced in August 2016 with total budget of BAM 2,000,000.00. Funding was available for three categories: public sector buildings, SME commercial buildings and industrial processes, where maximum amount for single project was BAM 200,000.00. Three projects were allocated funds, and approved in December, so number of EE infrastructure projects approved with loan financing modality in 2016 is 3.

63. Total budget allocated by EF FBiH to finance EE projects through the revolving fund was BAM 2,000,000 in 2016 and BAM 2,000,000 in 2017 with an increased projection of 50% (e.g. targeting at least BAM 3,000,000) in FBiH with the aim to reduce as much as possible grant financing and allocate as much as possible funds into the revolving fund (grants are intended to be used only for project preparation activities, such as energy audits, technical design, pre and feasibility studies and similar), while in RS the first year allocation for the revolving fund, once established and operational, is projected at up to BAM 500,000 for the first call.

64. The rating for achieving the target of Outcome 3 is High Satisfactory (HS).

Table 3 Assessment of progress: Project Component 3

Indicator	Basel ine	End-of-project target	Progress at mid-term review	Rating

		2018	2015-2016	
Outcome 3 3.1 % of increase of financial resources allocated for EE measures through the Fund by the end of 2018	0	100%	100%: 2,000,000 BAM – FBiH 500,000 BAM - RS	HS
Outputs 3.1. Number of EE infrastructure projects implemented with grant co-financing modality	0	60	69	HS
3.2. Number of EE infrastructure projects implemented with loan and performance based granting financing modality	0	25	3	S

Indicator Assessment Key	Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

4.1.4. Outcome 4

65. This project component is directly supported by SIDA.

66. The activities under this component are related to implementation of EE improvements measures in public buildings throughout BiH. The methodology of selecting the buildings, contracting a service provider and monitoring the savings was described earlier and in the Annex 4.

67. The progression of number of implemented retrofit projects shows significate increase after partnership with SIDA was agreed upon:

- 2013/2014 – 4 buildings
- 2014/2015 – 13 buildings
- 2015/2016 – 25 buildings
- 2016 – in progress - 43 buildings

68. Figure 4 shows geographical distribution of implemented projects.

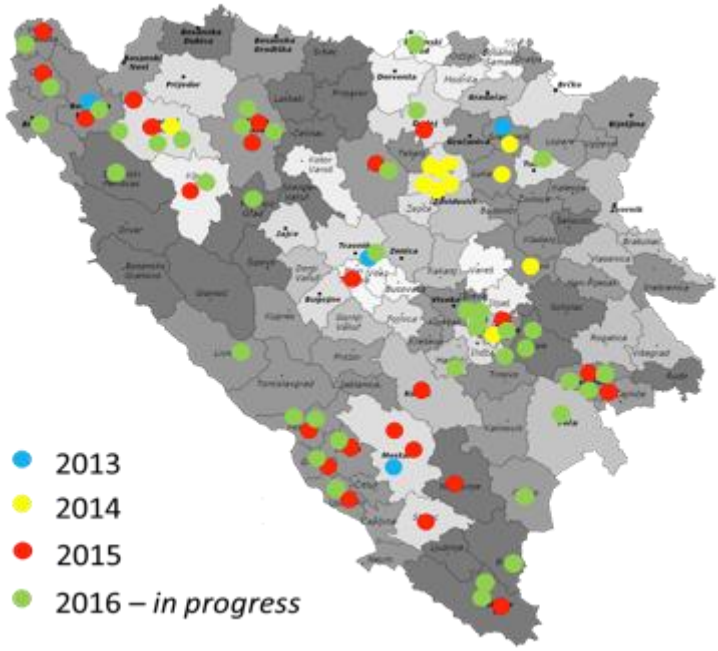


Figure 4 Geographical distribution of implemented buildings retrofit projects

69. The rating for achieving the target of Outcome 4 is Highly Satisfactory (HS).

Table 4 Assessment of progress: Project Component 4

Indicator	Baseline	End-of-project target 2018	Progress at mid-term review 2015-2016	Rating
Outcome 4				
4.1 Number of effectively implemented EE infrastructure projects in public sector buildings	0	85	69	S
Outputs				
4.1. Number of implemented EE infrastructure projects in public sector buildings	0	85	69	S
4.2. % of total energy consumption savings within implemented public sector buildings	0	>50%	52%	HS
4.3. Achieved energy class of public sector buildings after EE infrastructure measures	Energy class "E" (>220 kWh/m2 a)	Energy class "B" (average consumption <95 kWh/m2 a)	86 kWh/m2 a	HS
4.4. % of total energy cost savings within implemented	0%	20%	50%	HS

public sector buildings			
4.5 Amount of direct CO2 emission reduction	4,760	4,377	S
4.6 Number of generated man-months "green jobs"	1,465	>800	S
4.7 Amount of co-financing infrastructure projects during SIDA's involvement (by end-users/institutions/Environmental Fund)	2,538,000 Eur	3,276,478 Eur	HS
4.8 Number of end-users/institutions reinvesting generated savings into other infrastructure projects	85	23	S

Indicator Assessment Key	Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

4.1.5. Outcome 5

70. This project component is directly supported by SIDA.

71. A comprehensive marketing campaign including TV spots and guest appearances, radio jingles and social network channels has been conducted by the Project. During this media campaign 10 educational videos 30 seconds long, created in 2015, were adapted and distributed on local and national TV stations. Final number of seconds outreached was 6,630. Besides that, during the campaign TV appearances and media reports on national stations were distributed in total duration of 6,701 seconds. Also, all events were covered by local TV and Radio stations, which published the announcements of events, but also often filmed reports and statements on site, and broadcast them multiple times. It is estimated that these broadcasts covered more than 4,500 seconds. Including all mentioned, total number of seconds achieved through Media campaign is around 18,000.

72. 15 Open-air events were held in cities in BiH, 1 events was held within EnviroDay in August, 1 events was held during the Night of inventors in September, as a part of global event, and 3 events were held during the holiday's time. This event spreading enabled slightly different approach to target group — kids. Besides these events, we also organized 15 workshops in schools with target group of kids aged 10-11.

73. The Facebook page Professor Atom published various tips for smart energy use, as well as various places of interest concerning energy efficiency, which are often shared with other users of social networks. Special interest was paid to the newly created web page and online game "Like for smart energy". Web page provides smart energy tips, as well as educational materials and platform presenting renewable energy sources.

74. The rating for achieving the target of Outcome 5 is Satisfactory.

Table 5 Assessment of progress: Project Component 5

Indicator	Baseline	End-of-project target 2018	Progress at mid-term review 2015-2016	Rating
Outcome 5				
5.1 Change of attitudes and perception on EE of targeted audiences (children age 13+, youth and general public)in targeted 15 cities countrywide– measured using pre and post campaign survey, using questionnaires and online surveying tools (qualitative and qualitative)	low knowledge	moderate-to-high general knowledge positive perception and attitudes	Not available	-
Outputs				
5.1. Media campaign outreach achieved (seconds)	0	90,000	43,964	S
5.2. Number of awareness raising events held in BiH	0	75	35	S
5.3. Number of promotional materials distributed	0	150,000	80,172	S
5.4. Number of people reached through marketing campaign	0	500,000	850,000	HS
5.5. Number of posts at GED public awareness campaign social networks (professor Atom)	0	4,000	1,700	S

Indicator Assessment Key	Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

4.1.6. Cumulative progress

75. This analysis is conducted based on the review of indicators in the Results Framework against progress made towards the end-of-project targets, i.e. Project's achievement against objective and outcomes; for each outcome all outputs are analysed as well. The assessment of progress has been based on the findings of the MTR mission, interviews with the project stakeholders, Project Progress Reports (2015, 2016), and minutes of Project Board meetings. Cumulative Project Progress towards results ay the outcome level is presented in **Error! Reference source not found.**.

Table 6 Assessment of project results

Effectiveness	Rating
Outcome 1	Highly Satisfactory (HS)
Outcome 2	Satisfactory (S)
Outcome 3	Highly Satisfactory (HS)
Outcome 4	Highly Satisfactory (HS)

Outcome 5	Satisfactory (S)
Overall	Highly Satisfactory (S)

Indicator	Baseline	End-of-project target 2018	Progress at mid-term review 2015-2016	Rating
Outcome 1				
1.1 Number of detailed energy audits assessed and prioritized for funding	0	140	>300	HS
1.2 Number of energy professionals participating on training programme for skills and knowledge development	0	500	556	HS
Outcome 2				
2.1 Number of sub-national authorities with reporting mechanisms in place (target value: 7 – e.g. 5 cantons in FBiH, 2 ministries in RS).	0	7	5	S
Outcome 3				
3.1 % of increase of financial resources allocated for EE measures through the Fund by the end of 2018	0	100%	100%: 2,000,000 BAM – FBiH 500,000 BAM - RS	HS
Outcome 4				
4.1 Number of effectively implemented EE infrastructure projects in public sector buildings	0	85	86	HS
Outcome 5				
5.1 Change of attitudes and perception on EE of targeted audiences (children age 13+, youth and general public)in targeted 15 cities countrywide– measured using pre and post campaign survey, using questionnaires and online surveying tools (qualitative and qualitative)	low knowledge	moderate-to-high general knowledge positive perception and attitudes	Not available	-

4.2. Project implementation

76. The project is implemented by UNDP with close cooperation and coordination with EE funds in Federation and RS. The project organigram is provided on Figure 5.

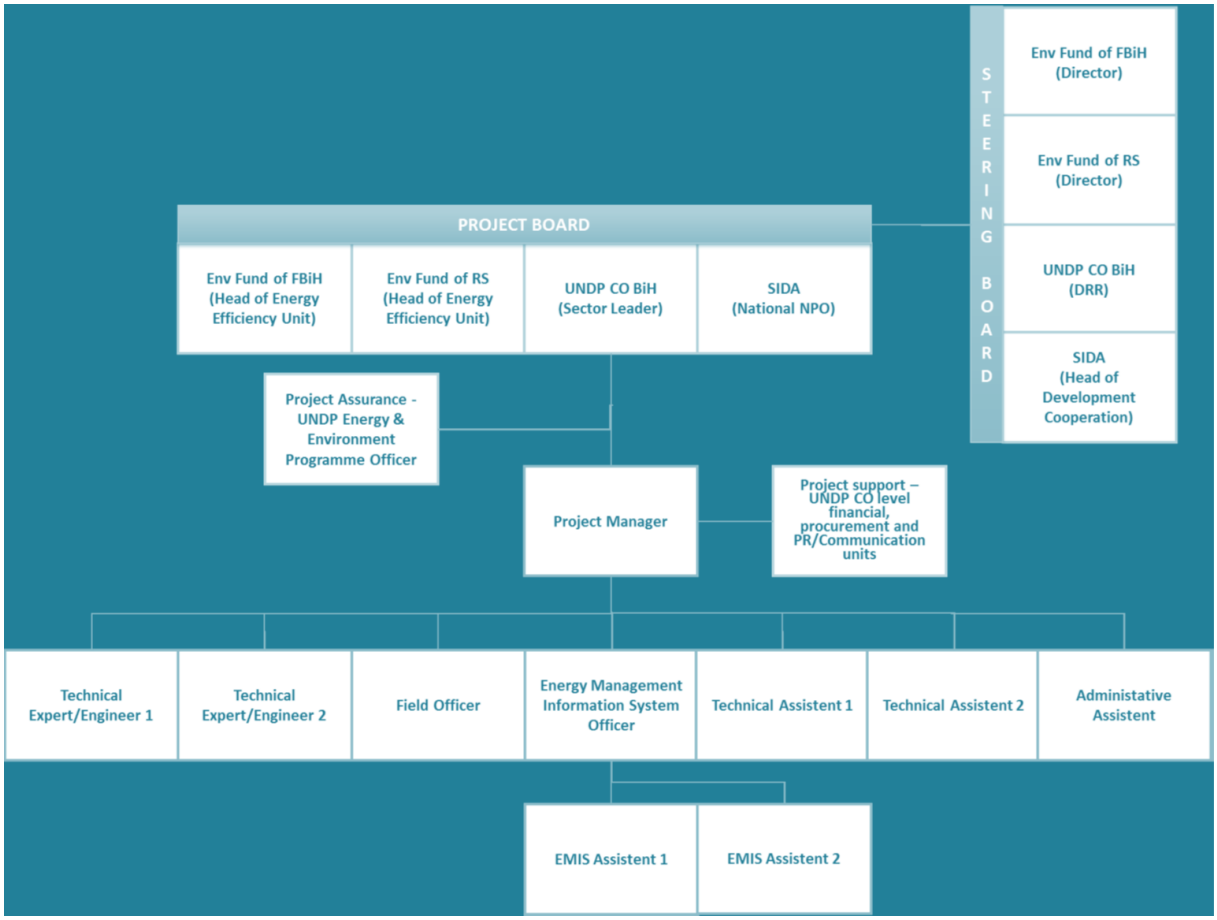


Figure 5. Project Implementation organigram

77. Project Board was established consisting of the representatives of the project's main stakeholder as follows:

- EE Fund of RS
- EE Fund of FBiH
- MOFTER
- SIDA

78. The Project Board was meeting on semi-annual basis, and the Minutes of the meetings were maintained.

79. The Project team has adopted an effective and transparent approach to project implementation related to the component 4: 'Implementation of infrastructural energy efficiency measures in public sector buildings' which is the key component supported by SIDA.

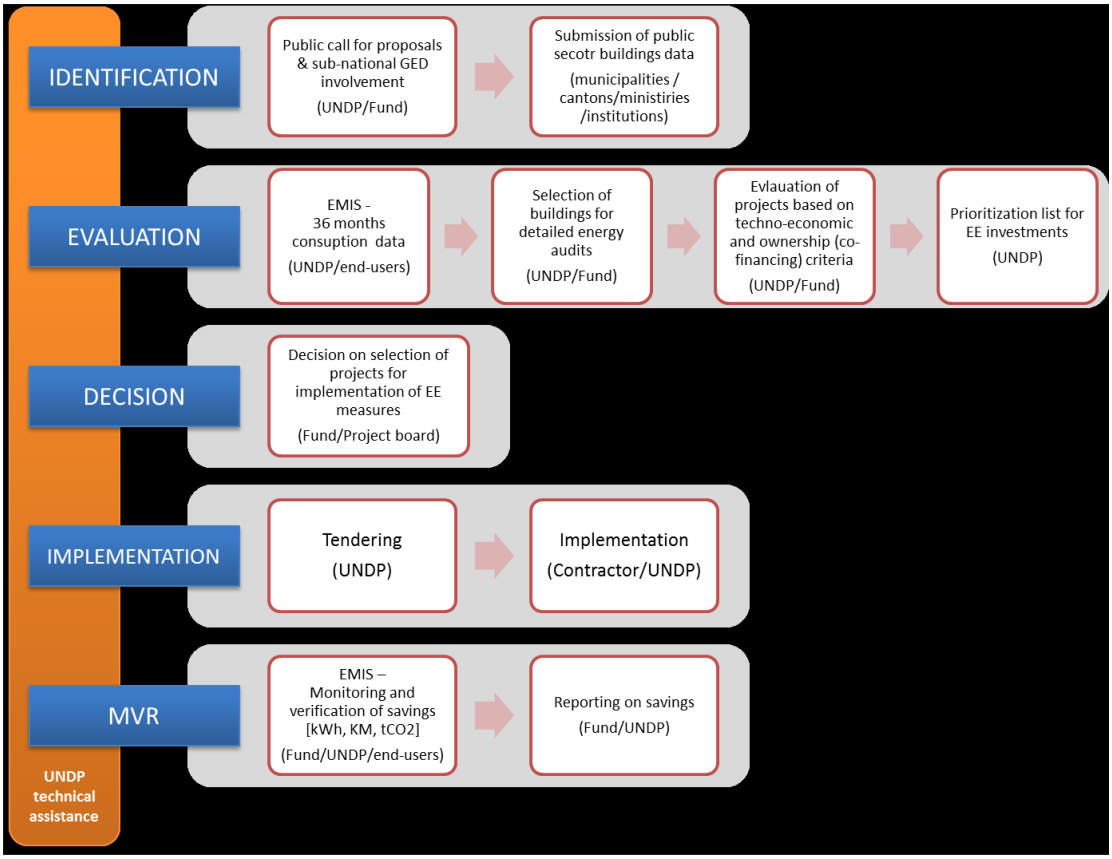


Figure 6. Approach to project implementation

80. Figure 6 illustrates the implementation approach which starts with public call for proposals for cooperation with the Project. This is followed by evaluation of energy consumption and building data and prioritization of received proposals. The whole procedure is described in details in the Annex 5.

81. The UNDP's Energy Management Information System (EMIS) is a backbone of the implementation strategy, as well as of the project-level monitoring system. EMIS contains data received on particular buildings and maintains inventory of registered public buildings. Based on the collected energy, economic and emission data through EMIS, and the resulting indicators, a techno-economic prioritization has been conducted in order to choose the public sector buildings with the highest energy conservation potential in order to conduct detailed energy audits. As such EMIS provides for objective and transparent approach in prioritizing investments in EE improvements of public buildings.

82. The elements of the project level monitoring are based mostly om EMIS which contains records of public buildings, and track the results of implemented retrofit projects – See Annex 3 for details. While EMIS is an extremely effective and powerful tool to monitor key project results, such as real energy and cost savings, as well as associated GHG emission reduction, its functionality to track other socio-economic impacts is rather limited. For now it only provides data on the building end-users, without further disaggregation by gender and/or other socio-economic factors. Additional efforts are needed to systematically collect such information for pilot projects.

83. Stakeholder Engagement: Due to the complex nature of the BI& administrative structure, as well as complex nature of the GED Project itself which covers de factor different sectors of economy (energy supply and demand, local development); the Project is assisting/cooperating with various market stakeholders. The main Project stakeholders include:

B & H MOFTER

FBIH

- Environmental Fund of the FBiH
- Ministry of Spatial Planning of FBiH
- Tuzla Canton
- Una-Sana Canton
- Central Bosnia Canton
- Canton 10
- West Herzegovina Canton
- Canton Sarajevo
- Bosnian-Podrinje Canton

RS

- Environmental Protection and Energy Efficiency Fund of the Republic of Srpska
- Ministry of Education and Culture
- Ministry of Health and Social Welfare
- Ministry of physical planning, civil engineering and ecology of RS (WB PIU)

International development partners

- World Bank Energy Efficiency Project
- GIZ
- USAID
- Czech Development Agency

Beneficiaries

- End-users of pilot/technical demonstration projects– primarily responsible for the post-implementation monitoring & evaluation

4.3. Effectiveness: Extent of Attainment of planned Outcomes

84. Outcome Objective 1 ”To develop capacities and strengthen skills for energy efficiency and energy management”: GED project supported a range of activities aimed at building skills and capacities for energy efficiency, energy management and EE financing, including preparation of detailed energy audits, delivering training programme for energy professionals, undertaking baseline study and preparing typology of public buildings, as well as rule books for Environmental Funds. All these activities were essential in laying the foundation for successful identification, implementation and eventual financing of investment in EE buildings (under Outcome 4). The rating for effectiveness of

Outcome 1 is Satisfactory (S).

85. Outcome Objective 2 "To establish energy monitoring and reporting mechanism for public building sector in BiH": GED supported wide-scale introduction and institutionalization of the Energy Management Information System (EMIS) for public buildings, which enables monitoring and management of energy consumption and GHG emissions at building and sector level. EMIS currently covers 50% of all public sector building in BiH. With continued GED project support EMIS will be rolled out to cover all public building making BiH the only country in the world with such comprehensive building-sector MRV in place. The rating for effectiveness of Outcome 2 is Satisfactory (S).

86. Outcome Objective 3 "To enable financing for EE infrastructure projects in BiH": GED project contributed to the establishment of an Energy Efficiency Revolving Funds (EE RFs) within the Environmental Funds (EFs) of FBiH and RS (the latter is expected to be operational towards the end of 2017) by developing internal acts of the Fund and providing technical and advisory support to EFs staff. Total budget allocated by EF FBiH to finance EE projects through the revolving fund was BAM 2,000,000 in 2016 and BAM 2,000,000 in 2017 with an increased projection of 50% (e.g. targeting at least BAM 3,000,000) in FBiH with the aim to reduce as much as possible grant financing and allocate as much as possible funds into the revolving fund (grants are intended to be used only for project preparation activities, such as energy audits, technical design, pre and feasibility studies and similar), while in RS the first year allocation for the revolving fund, once established and operational, is projected at up to BAM 500,000 for the first call. The rating for effectiveness of Outcome 3 is Highly Satisfactory (S).

87. Outcome Objective 4 "EE in public buildings scaled-up in most cost-efficient way": GED project provided over 5 mln EURO in financing for EE retrofits of public buildings and progressive increased the co-financing ratio for SIDA's contribution from 50% in the beginning of the project up to 140%, as illustrated in Table 7. High co-financing ratio has not only achieved high cost-effectiveness of the GED investment, but also helped ensure stronger buy-in and ownership of the project by the end-users. Equally important is the high level of energy and cost saving achieved through EE retrofit measures, i.e. 50% on average against initial target of 20%. Collaboration with parallel WB Energy Efficiency Project and UNDP Biomass Promotion project further contributed to over-all effectiveness of project results: by realizing synergies and additional opportunities to increase the level of energy saving and co-financing. Lastly, the project led to cumulative GHG emission reduction in the amount of 5,854tCO2/year or 146,350 tCO2 over lifetime thus exceeding initial target of 4,760 tCO2 by project end, as well as yielding cost-effective ratio for SIDA's financial contribution, i.e. 16 $/tCO2. The rating for effectiveness of Outcome 4 is Highly Satisfactory (HS).

Table 7 Investment in EE retrofits in public buildings: SIDA and Co-financing (EURO)

	2015	2016	Total
SIDA	936 552	1 396 000	2 332 552
Co-financing	1 323 343	1 953 135	3 276 478

TOTAL	2 259 895	3 349 135	5 609 030
Co-financing ratio	141%	140%	140%

88. Outcome Objective 5 "To increase general public understanding of EE benefits": GED project conducted wide-scale awareness raising and advocacy campaign effectively reaching out to 78% of the country's population and directly to over 500,000 people. However, the effectiveness of PR activities in terms of changed awareness, perception and behaviour cannot be assessed at this stage. Once the project conducts social survey (schedule for the year 2018), such assessment and conclusion regarding effectiveness in achieving the intended outcome can be made.

89. Overall effectiveness of project in attaining intended outcomes is rated as Satisfactory (S) – see Table 8Table 8.

Table 8 Assessment of project effectiveness

Effectiveness	Rating
Outcome 1	Satisfactory (S)
Outcome 2	Satisfactory (S)
Outcome 3	Highly Satisfactory (HS)
Outcome 4	Highly Satisfactory (HS)
Outcome 5	Satisfactory (S)
Overall effectiveness	Satisfactory (S)

4.4. Social, economic and environmental impacts: contribution to SDGs

90. Apart from the achievement of intended project outcomes, GED project has resulted in a number of broader socio-economic and environmental benefits. These benefits have been assessed and evaluated by MTR team using appropriate UN Sustainable Development Goals (SDGs) in line with the "Indicators and Monitoring Framework for the UN Sustainable Development Goals[3]" (See also Text Box 1 for details on SDGs). It has been established that GED project made contribution to a number of SDGs, as follows:

- Positive impact on net income generation and increase in public spending on health, education and other social sectors contributed to **SDG 1** "End poverty in all of its form everywhere"
- Retrofitted public buildings provided for improved occupancy conditions, adequate warmth in schools and hospitals, as well as increased availability of public funds for investment in medical services (**SDG3** "Ensure healthy lives and promote wellbeing for all at all ages");
- Energy saving and associated budgetary saving in education sector made additional funding available for investment in improved educational services and improved learning conditions for pupils (**SDG 4** "Ensure

[3] https://sustainabledevelopment.un.org/content/documents/2013150612-FINAL-SDSN-Indicator-Report1.pdf

inclusive and equitable quality education and promote lifelong learning opportunities for all")

- Implementation of EMIS and energy management system in public buildings empowered women – majority of managers and users of public buildings – to acquire new skills and knowledge making them better prepared to fulfil their professional and domestic tasks (**SDG 5** "Achieve gender equality and empower all women and girls")
- Significant energy saving achieved by the project resulted in improved access of local communities, including vulnerable groups, to clean, safe and affordable energy (**SDG 7** "Ensure access to affordable, reliable, sustainable and modern energy for all");
- Sizable investment in infrastructure works led to additional job creation and revenue generation effects for local economy (**SDG 8** "Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all").
- Global environmental benefits in the form of GHG emission reduction represent project's direct contribution to **SDG 13** "Take urgent action to combat climate change and its impacts".

91. The following sub-sections explain proposed approach to assess SDG-related benefits and impacts of the GED project and the key results of this assessment.

Text Box 1 - Sustainable Development Goals (SDGs)

At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. The 17 goals for SDGs are as follows:
1) End poverty in all its forms everywhere
2) End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3) Ensure healthy lives and promote wellbeing for all at all ages
4) Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5) Achieve gender equality and empower all women and girls
6) Ensure availability and sustainable management of water and sanitation for all
7) Ensure access to affordable, reliable, sustainable and modern energy for all
8) Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all
9) Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation
10) Reduce inequality within and among countries
11) Make cities and human settlements inclusive, safe, resilient and sustainable
12) Ensure sustainable consumption and production patterns
13) Take urgent action to combat climate change and its impacts

14) Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15) Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation, and halt biodiversity loss
16) Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17) Strengthen the means of implementation and revitalise the global partnership for sustainable development

4.4.1. SDG 1: Poverty Reduction

92. BiH suffers from high level of poverty. Almost half of the country can be considered to be at risk of poverty and social exclusion: 27 % is at risk of poverty, 27 % lives in severe material deprivation, and 28 % live in households with very low work intensity[4]. Poverty reduction is not a primary objective of the GED project but it did contribute to the achievement of SDG 1 in BiH in several ways.

93. *Jobs translate economic growth into sustainable poverty reduction*. BiH has a very low employment rate: increasing employment rates and reducing unemployment is the main political and national priority in the area of poverty reduction, particularly among hard-to-employ population groups and in areas and regions characterised by sustained high unemployment. By providing and leveraging additional investment in EE building retrofits (for the total of 5,6 mln Euro over 20015-2016) the project has directly generated 1,6 mln Euro in net salaries, including 0,6 mln Euro for low-skilled workers (i.e. the category of people who are more likely to be unemployed and face the risks of poverty[5]). Assuming minimum monthly wage for BiH of 202-210 Euro/month (as of January 2017), this translates into direct poverty reduction impact for at least 122 people (counting only net salaries for low-skilled workers).

94. *Increased and more efficient public investment in health, education and other priority social sectors.* BiH Mid-Term Development Strategy (Poverty Reduction Strategy Paper) calls for reorientation and increased efficiency of public spending in priority social sectors, such as health-care and education. GED project has provided a tangible and practical example how such reorientation can be achieved: as a result of GED project interventions, a total of 2,1 mln BAM/year has been re-allocated from non-core expenditures in public services sectors (i.e. payment for energy bills by public building end-users) to investment in core activities, i.e. spent on procurement of new medical equipment, educational needs, etc, leading to increased share of the

[4] Poverty and Social Exclusion in Bosnia and Herzegovina. Available at http://documents.worldbank.org/curated/en/149881468186564195/pdf/97641-ESW-P132666-and-P152786-Box385353B-PUBLIC-BIH-Poverty-and-Social-Exclusion.pdf
[5] Western Balkan Labor Market Trends 2017. World Bank 2017. Available at http://pubdocs.worldbank.org/en/336041491297229505/170403-Regional-Report-Western-Balkan-Labor-Market-Trends-2017-FINAL.pdf

governmental spending on essential services, such as education and health. This corresponds to an increase in 0,1% of the total BiH expenditures for goods and services in public sector[6].

95. Summary of GED project contribution to the achievement of SDG1 in BiH is presented in Table 9.

Table 9 GED Project Contribution to SDG 1

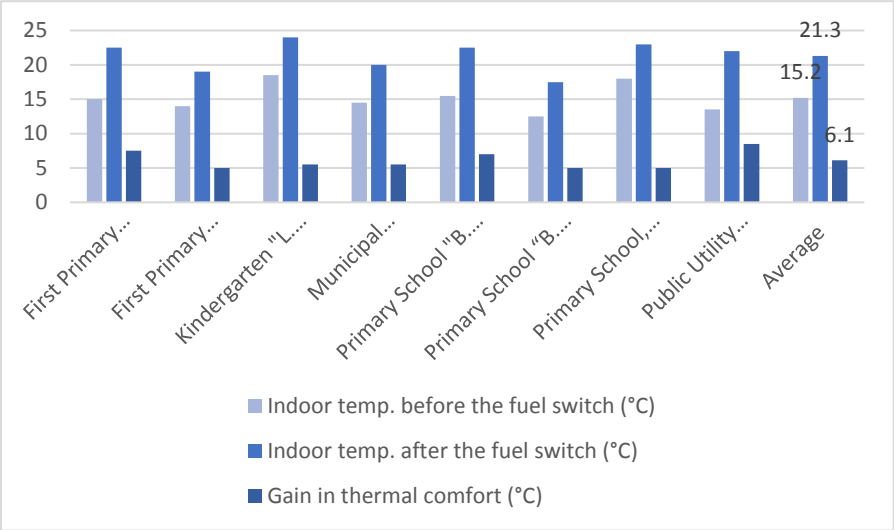
SDG 1 Indicators	GED Project contribution
1.1.1 Population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)	Decrease by at least 123 people (as a result of new employment).
1.a 2 Proportion of government spending on essential services (education, health and social protection)	Increase by at least 0,1%

4.4.2. SDGs 3 and 4: Health and Education

96. Under-heating and below-standard lighting are widespread in BiH public buildings: resulting in sub-optimal occupancy conditions: 44% of public sector buildings are under-heated in BiH and they use 20-30% less energy than required to ensure sufficient thermal comfort. Given the state of the buildings in BiH, their dilapidation, decrepitude, and other consequences of natural or other causes, thermal comfort cannot be achieved because the heat losses are so high that cannot be overcome only by improvement in heating systems. For example, there are public buildings where children spend their time or infirm persons, and where thermal comfort cannot be achieved. This means that the temperature of the interior space should be at 21/22 °C (depending on the purpose of the building), but due to the above facts, this temperature remains at 12/17 °C. Energy audits conducted by the project confirmed that under-heating is indeed particularly widespread in school buildings in BiH (see
97. Figure 77).

Figure 7 Thermal comfort in public buildings before and after EE-RE Measures

[6] Estimated based on data from Public Expenditure and Financial Accountability Assessment. World Bank: 2014. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/20768/826460WP0P13180Report0Sept020140eng.pdf?sequence=1&isAllowed=y



Source: UNDP 2016. *"Analysis of the Benefits of Wood Biomass Fuel Switch Projects"*

98. Consequently, GED-supported investment in energy efficiency improvements, complemented by fuel-switch measures (co-funded) in public buildings created conditions that support improved occupants' health and well-being, particularly among vulnerable groups such as children, the elderly and those with pre-existing illnesses. The observed benefits include improved physical health such as reduced symptoms of respiratory and cardiovascular conditions, rheumatism, arthritis and allergies, as well as fewer injuries. Though quantification of those benefits was not possible in the course of this study, several international studies that quantified total outcomes found benefit-cost ratios as high as 4:1 when health and well-being impacts were included, with health benefits representing up to 75% of overall benefits[7].

99. Health and well-being benefits are consistently strongest among vulnerable groups, including children and those with existing illnesses. In this respect, GED project's particular emphasis on educational and health facilities is commendable as it brought direct health benefits to over 39,000 children and close to 19,000 patients, occupants of the public buildings with improved thermal comfort and health conditions.

100. In addition to direct health benefits, the project has also led to increase availability of funds for investment in health and educational services, as a result of achieved energy and consequently cost-saving. Analysis of data for selected facilities (Table 10 and Table 11) demonstrated that availability of funding in health sector has increased on average by 1-4% or 12-40US$/patient/year, though in some cases the increase has been much more significant - up to 160US$/patient/year or 17% compared to national average (i.e. 957 $/patient/year)[8].

Table 10 Cost saving in health sector

Facility	Annual cost saving	Number of	Saving	Increase from

[7] http://www.iea.org/publications/freepublications/publication/Captur_the_MultiplBenef_ofEnergyEficiency.pdf

[8] WHO

			patients	per patients	national average, %
	BAM	USD	ppl	USD/year	%
Hrvatska Bolnica Dr. fra Mato Nikolić	205 565	123 339	772	160	17%
JZU Kantonalna bolnica Goražde	65 073	39 044	2 500	16	2%
JU Dom zdravlja Maglaj	28 061	16 837	180	94	10%
Dom zdravlja Drinić	2 531	1 519	128	12	1%
JZU Bolnica Sveti apostol Luka	79 480	47 688	1 500	32	3%
Dom zdravlja Vogošća	34 467	20 680	550	38	4%

101. Similarly, in educational sector availability of funding has increased on average by 8-27% compared to national average or by 8-27US$/pupil/year, though again in certain cases much more significant increase has been observed, i.e. up to 79US$/pupil/year or 23% above national average (i.e. 345 $/pupil/year)[9]

Table 11 Cost saving in educational sector

Facility	Annual cost saving		Number of pupils	Saving per pupil	Increase from national average, %
	BAM	USD		USD/year	%
Srednja strukovna škola Orašje	21 205	12 723	472	27	8%
OŠ \Lukavac Mjesto	10424	6 254	828	8	2%
OŠ \Bužim	20565	12 339	1500	8	2%
Prva osnovna škola, PŠ Mala škola	7224	4 334	270	16	5%
OŠ \Ivana Brlić Mažuranić Ljubuški	17780	10 668	135	79	23%

Table 12 GED Project Contribution to SDG 4

Relevant SDG 3 and 4 Sub-goals and Indicators	GED Project contribution
3c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	Health financing increased by 1-5% compared to average national level (per patient/per year)

[9] Estimated based on data from Public Expenditure and Financial Accountability Assessment. World Bank: 2014. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/20768/826460WP0P13180Report0Sept020140eng.pdf?sequence=1&isAllowed=y

4a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	62 schools and kindergartens with improved thermal comfort and lighting systems

4.4.3. SDG 5: Gender

102. BiH has the lowest economic activity rates of women in the region with only 33% of the working age women being economically active. According to the official statistics, unemployment rate for women is at 31,2%[10] (compared to 25,2% for men). Furthermore, 67 % of working age women do not participate in the labor force, which increases their economic dependency and diminishes their role in public life. Often, women bear the "double burden" of unpaid housework, and caring for children and the elderly as well as paid work. The last census uncovers that out of 89.794 illiterates in total, the vast majority or 77.557 are women.[11] Adding a new dynamic to this economic inactivity and invisibility of women is the force of "re-traditionalising" which is being reported particularly in rural areas. The overall high levels of unemployment among women in BiH exacerbate economic dependency of women and diminish their role in public life.

103. GED project contributed to women economic empowerment and gender equality in several ways. First, women are the largest category of users and occupants of public buildings (See Text Box 2) and therefore have benefitted the most from the health and well-being improvements brought about by the investment in EE infrastructure measures: out of the total of *60,000 direct beneficiaries, 37,800 (60%) - women*.

104. Further, under Component 2 through its extensive training and capacity building activities the project have built essential technical skills and knowledge among women buildings end-users (who formed the majority of the target audience), i.*e. an estimated 1,800 female end-users trained in EMIS data management (out of the total 3,000 people trained)*. According to interviews with selected female EMIS end-users in the course of project evaluation, such training and direct exposure to EMIS has been beneficial and enhanced their professional competence, helped develop new technical skills and expanded knowledge to new domains, such as energy and environmental management. It also prompted some of the interviewees to put more emphasis on energy management in their daily household life and/or think of identifying new areas for improvement in the buildings under their direct responsibilities.

105. Finally, the project has increased participation of women, energy sector professionals in technical training: *224 or 50% of all trainees were women*. This is a signficant achievement, because the employment gap in industry in BiH is

10 BiH Agency for Statistics, 2016.
11 http://www.popis2013.ba/popis2013/doc/Popis2013prvoIzdanje.pdf

particularly high: the sector employs three times more men than women[12].

Table 13 GED Project Contribution to SDG 5

Relevant SDG 5 Sub-goals and Indicators	GED Project contribution
5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	224 (50%) women acquired new technical skills and knowledge to enable their active and equal participation in the economic life
5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	1,800 (60%) women trained on use of EMIS

4.4.4. SDG 7: Access to energy

106. Although BiH is a net exporter of electricity, all gas and petroleum products, which account for 42% of the Total Primary Energy Supply (TPES) have to be imported[13]. Measures to increase energy efficiency, but in particular fuel switch measures (i.e. from imported oil and gas to domestically available biomass) helped local communities to expand and improve access and affordability of essential energy services (in particular heating in winter time), effectively enabling them to supply energy to more people at lower costs through the existing energy infrastructure. As a result, over 15,000 people across BiH are now primarily relying on clean fuels as far as heat supply is concerned (See Table 14).

107. GED project practically demonstrated technical feasibility of achieving ambitious SDG 7 global goal of doubling the rate of energy efficiency improvements: in all retrofitted buildings energy performance characteristics have more than doubled, i.e. from 220 kWh/m2 and higher down to 86 kWh/m2.

108. An important aspect of GED project is its focus on EMIS as a tool to promote behavioural changes among building end-users. This is important because some of the measures for increasing EE that could reduce energy consumption by up to 20% do not require any additional investments. These are referred to as "free EE measures". These measures require a change in behaviour of the personnel, a modified operating regime for equipment and systems, and the introduction of energy management. The methodology is to implement free measures first, and then introduce the planned implementation of additional EE measures, which require financial investment. The achieved results and accumulated savings from the free EE measures could be a trigger for investing in further EE improvements. By introducing EMIS in over 2,000 public buildings, GED project has promoted such behavioural changes on a large scale

[12] Gender analysis report for Bosnia and Herzegovina. USAID. 2016. Available at http://measurebih.com/uimages/Edited20GA20Report20MEASURE-BiH.pdf

[13] Energy Statistics and Energy Balances for non-OECD countries. OECD/IEA. 2016. Available at http://www.iea.org/statistics/statisticssearch/report/?year=2015&country=BOSNIAHERZ&product=Balances

and results in the change of attitudes towards energy efficiency among thousands building managers. While specific estimates of such "no cost" energy measures (measures without investments, but only involving behavioural changes) have not yet been made in BiH. Based on similar experience in Croatia[14] with EMIS introduction, annual saving from such measures can be estimated at over 500,000 EURO.

Table 14 GED Project Contribution to SDG 6

Relevant SDG 6 Sub-goals and Indicators	GED Project contribution
Indicator 7.1.2: Population with primary reliance on clean fuels and technology	15,567 end-users of public buildings relying on clean fuels (biomass) for heating
Sub-goal 7.3: By 2030, double the global rate of improvement in energy efficiency	Improved energy efficiency of public buildings from over 220 kWh/m2 down to 86 kWh/m2, by over 50%

4.4.5. SDG 8: Prosperity and Jobs

109. High level of unemployment is one of the key development challenges BiH faces today: the total ILO-defined unemployment rate is 29%, while the official or registered unemployment rate is 46.1%. Energy efficiency has a variety of positive impacts that support economic growth, for example, by creating new employment opportunities for local population. Investment in EE are quite labor intensive and therefore are associated with strong local job creation impacts, in particular for skilled and semi-skilled work-force. Direct employment means employment generated as a result of the increase in demand for goods and services directly related to the implementation of EE-RE measures.

110. GED project conducted comprehensive assessment of direct employment generation effect of investment in EE and RE measures in public buildings (hospitals, schools, etc.) by analysing data on the EE-RE measures applied in 34 completed buildings with a total heated floor area of 77,147 m2. As a result, estimates of the number of full-time equivalent (FTE) jobs per €1 investment in EE-RE measures have been obtained: €1 million spent in EE-RE measures generates 96 full-time equivalent (FTEs). In other words, it is possible to employ 96 individuals on a full-time basis for one year. This number is suitable for comparison with other countries and projects, whereas for the in-country purposes it is more suitable to express it in national currency, where KM 1 million spent in EERE measures creates the potential for 589 man-months or 49 new jobs, primarily in the construction sector. The structure of these 49 new jobs includes mostly skilled workers – about 26, followed by about 18 semi-skilled workers, about three highly skilled workers, about three workers with university education and 0.2 unskilled workers.

111. By applying the established GED-project specific indices for job creation to the

[14] Lessons learnt from UNDP-GEF Project in Croatia. UNDP 2012.

total volume of investment in EE infrastructure 5,6 mln Euro), the total direct employment impact of the project can be estimated as 538 FTE jobs or 6,467 man-months (See Table 15).

Table 15 GED Project Contribution to SDG 8

Relevant SDG 8 Sub-goals and Indicators	GED Project contribution
Sub-goal 8.5: By 2030, achieve full and productive employment and decent work for all women and men	538 FTE jobs or 6,467 man-months created by the project

4.4.6. SDG 13: Climate Change

112. In the Intended Nationally Determined Contribution (INDC) under Paris Accord, BiH explicitly recognizes the potential of public sector buildings for GHG emission reduction and emphasizes that to "increase emission reduction amount and develop a sustainable system for public building renovation, international financial support is required".

113. Climate Change Adaptation and Low Emission Development Strategy of BiH features four priority sectors for climate change mitigation, of which energy efficiency in buildings is highlighted as having the strongest potential for emission reduction and is presented as a key priority at national level. The Strategy clearly indicates that fuel switch measures in buildings should be accompanied by energy efficiency measures. Finally, the Second National Communication to the UNFCCC (2013) also emphasizes the potential for considerable GHG emission reductions (up to 80%) from improving the thermal performance of building envelopes (thermal insulation of roofs, exterior walls, floors, better sealing, replacement of windows), replacing HVAC systems, as well as fuel switch measures (from fossil fuels to biomass) in buildings.

114. By supporting implementation of the above-referred climate change mitigation measures in public sector buildings, GED project therefore directly contributed to SDG 13 in the form of direct GHG emission reductions of 5,854 tCO2e/year or 146,350 tCO2 over investment lifetime at total cost of 38 USD/tCO2 or 16 USD/tCO2. The latter is cost-effective compared with relevant international benchmarks such as the value of enacted carbon taxes or similar carbon pricing mechanism in existence in Sweden (over 100 euro/tCO2), EU and other countries around the world.[15]

Table 16 GED Project Contribution to SDG 13

Relevant SDG 13 Sub-goals and Indicators	GED Project contribution
Sub-goal 13.2 Integrate climate change measures into national policies, strategies and planning	5 energy efficiency action plans developed and adopted by regional/local authorities
Indicator: 13.2.1: GHG emission reduction over investment life-cycle (tCO2)	5,854 tCO2e/year or 146,350 tCO2e over investment lifetime

[15] World Bank 2016. State and Trends of Carbon Pricing.

Indicator 13.2.2: Cost-effectiveness of GHG emission reduction	38 USD/tCO2e

115. Detailed assessment of the project's human and sustainable development benefits is currently being conducted and shall result in more precise definition and estimation of such impacts. The MTE team also recommends that the project team reflects on these issues when developing evaluation/lessons learnt reports for the pilots.

4.5. Gender mainstreaming

Gender mainstreaming in project design

116. Gender equality has been reflected in the original project design. In particular, provisions were made to ensure gender-sensitive design of regulatory and policy frameworks, to warrant that both men and women benefit equally from services, funding, employment and capacity development opportunities supported by the project, as well as to encourage women to participate equally in activities led by the project. However, there were no gender-related activities incorporate in the project design, no there were any specific indicators and targets set-up in the GED logical framework to enable monitoring and reporting on the progress and impacts of the project in this area.

Gender mainstreaming in project implementation and M&E

117. Already at project implementation stage, project team made initial progress in monitoring and reporting on gender-related aspects within the scope of Project Component 1: one additional gender indicator has been introduced and monitored (See Table 17). From the onset of project implementation in 2015, commitment has been made to improve and systematize the process of sex disaggregated data collection, to track, collect and codify gender impact of the project through collecting stories of the beneficiaries and publishing them in the form of blogs and social media inputs, as well as to ensure that any publications and report incorporate a gender dimension in its methodology and text. This commitment has been reflected in the GED Project Annual Report for the year 2015.

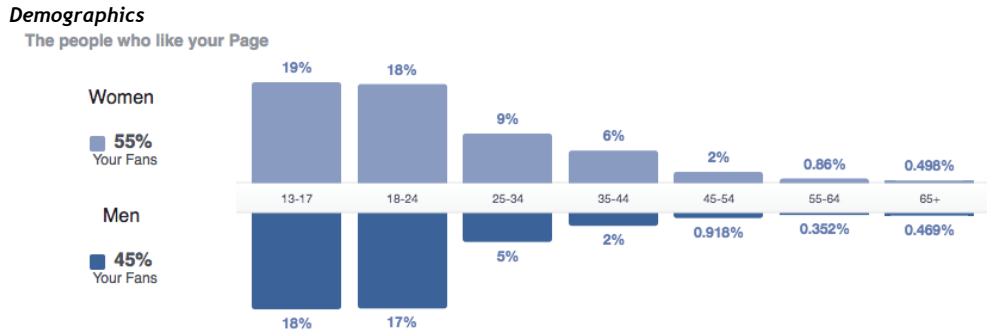
Table 17 Gender Indicators and Results in the GED Logical Framework

Indicator	Target	Results	
		2015	2016
Number of female energy professionals participated on training programme for skills and knowledge development	30	100	124

118. It has been established that the investment in EE retrofits of public buildings (under Component 4) it has reached out and directly benefitted 60% of female and 40% of male building end-users. Indeed, based on analysis of gender statistics regarding public sector employment and end-users (Text Box 2), more realistic and accurate estimate of women beneficiaries of GED project could stand at as high as 64,5% for employees and 50,9% for other end-users.

In addition, monitoring of the impacts of communication and outreach activities under Component 5 showed (Figure 8) that women were more active participants and recipients of information regarding EE than men, which indicate high potential for further strengthening their roles as energy managers and promoters of GED project ideas.

Figure 8 Gender in Communication and Outreach



Source: Media report

Text Box 2 Gender disaggregated data: employees and end-users of public buildings

Female employees in services sector including, public administration, defense, education, health and social works:

2014 -> 60,0%
2016 -> 64,5%

In education sector in particular, female employees account for much larger share:

98% of female educators in pre-school institutions
71% of female primary school teachers
60% of female secondary school teachers and associate and
43% of female teachers and assistants in higher education.

In public administration, the female employees as civil servants in the institutions of BiH represents 52,5%.

Female users:

48% of female users in pre-school education
49% of female users in primary education
50% of female users in secondary education
56% of female students in institutions of higher education

The total number/percentage of female users/employees in public buildings is therefore situated between 64,5% (employees) to 50,9% (users).
Source: Gender assessment "Women and Men in BiH" and Labour force survey

119. In terms of project management structure, GED team and Project Board have gender-balanced composition which includes 5 female and 7 male members of the Project team and 3 female and 2 male members of the Project Board.

Recommendation for gender mainstreaming in GED and follow-up initiatives

120. In order to further strengthen and emphasize gender-related aspects of the GED project, a three-pronged approach is proposed, in line with applicable international practices and guidance, including:
    - Gender analysis: to understand the specific aspects of gender inequality, if

exist, in the context of buildings energy (in)efficiency is concerned, and the social, economic and political factors underlying such inequalities, as well as the potential contributions of women and men to societal changes required to promote investment in energy efficiency;

- Gendered actions: identify and incorporate in the project design specific methods and tools to promote greater gender equality and reduce gender disparities in GED project activities.
- Gender-sensitive M&E: propose and measure the outcomes and impacts of project activities on women and men's through gender- responsive M&E. It is suggested that all Project Components of the GED project to include at least one gender-related indicator, as elaborated in
- Table 18.

Table 18 Proposed Gender-responsive M&E Framework for GED Project

Current Indicator	Proposed Revised Indicator
Component 1	
Number of Fund staff (FBiH and RS each) participating on annual capacity development training on energy efficiency, EMIS and EE policy	**Number of Fund staff (FBiH and RS each), including women, participating on annual capacity development training on energy efficiency, EMIS and EE policy**
Number of Fund staff (FBiH and RS each) actively working on EMIS/EE investment decision making process cycle, monitoring, assessing and evaluating energy indicators	**Number of Fund staff (FBiH and RS each), including women, actively working on EMIS/EE investment decision making process cycle, monitoring, assessing and evaluating energy indicators**
Component 2	
Number of EMIS end-users trained	**Number of EMIS end-users trained, including women**
Component 3	
N/a	**Number of financed applications with gender disaggregated indicators under the EFs calls for proposals**
Component 4	
N/a	**New Indicator: Number of direct beneficiaries of EE investment, including women**
Component 5	
Number of people reached through marketing campaign	**Number of people reached through marketing campaign, including women**

4.6. Communication and visibility

Communication Strategy and Results

121. From the onset the project has developed comprehensive Communication Strategy which has been regularly updated throughout implementation, including detailed Communication Plan. The latest update covers the period from April through December 2017; it specifies high-level messages, primary and secondary target groups, communication means, as well as M&E framework with SMART indicators to measure the results of communication activities. Specifically, for Outcome 5 "Public awareness and benefits of energy efficiency, energy management and reductions of GHG emissions is increased", the targets presented in the Project Results Framework consist of:

122. Target #1: Media campaign outreach achieved 90,000 seconds by project end (2018)
    - As part of Media Campaign supported by the project in 2015-2016, 10 educational videos (each 30 seconds long) were created and distributed on local and national TV stations. Number of seconds outreached was 14,430 in 2015 and 13,731 in 2016. As addition, promotional video for interactive on-line video game was also distributed on local TV stations. Number of seconds outreached was 1,320. Besides that, during the campaign TV appearances and media reports were distributed to local stations in total duration of 9,473 seconds in 2015 and 4,500 in 2016. Achievement of the target is on track.

123. Target #2: Number of awareness raising events: 75 by project end (2018)
    - The project supported a wide range of events, such as open-air events, side events within the framework of Investors' Night and Global Environment Day, workshops for children and youth. It also pro-actively used the opportunities associated with commissioning of new infrastructure projects (under Component 4) to bring attention of wider audience to project's achievements and popularize energy efficiency ideas among building end-users and beyond (See Figure 9). Achievement of the target is on track.

Figure 9 Examples of GED Project Events

124. Target #3: "Number of promotional materials distributed: 150,000 by project end (2018)

125. Wide range of promotion materials and products was produced and distributed, including brochures, flyers, leaflets, fact-sheets, smart tips on energy use, pins, dynamo torches, T-shirts. All Quality and content of published materials is generally high, including both content and design (Figure 10). It is also important the format and language of the materials adequately responds to the specific needs of the targeted audience. Achievement of the target is on track.

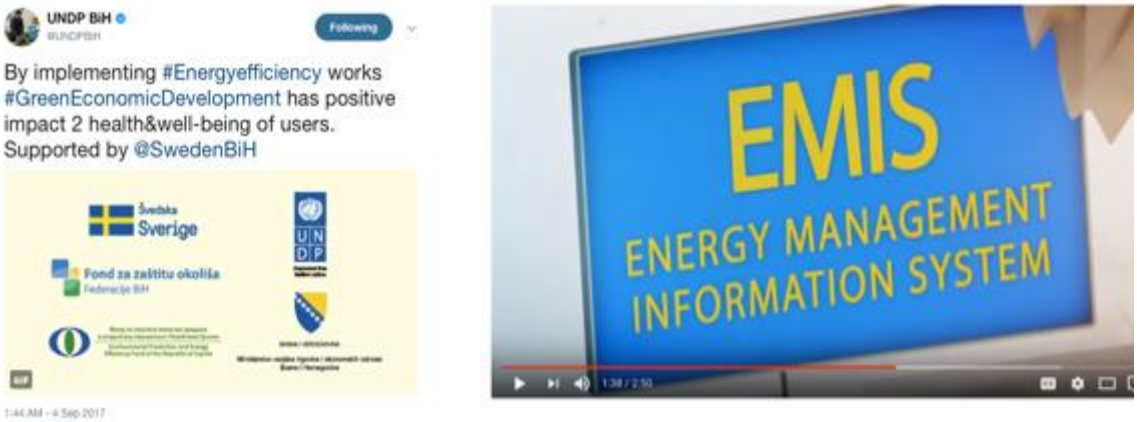
Figure 10 Examples of promotional and educational materials

126. Target #4: Number of people reached out through the campaign: 500,000 by project end (2018). As mentioned before, awareness raising campaign reached the audience through different means, depending on the targeted category, including more technical workshops for professionals, education activities for kids and advocacy for public at large. By far the most effective has been national TV broadcasts (educational videos, TV appearances, etc), which enabled the project to get its messages across to as much as 78.83% of BiH population (around 2,743,598 people). In terms of direct outreach, it was estimated (based on campaign reports) that over 500,000 people were reached out. Achievement of the target is therefore fully on track.

127. Target #5: "Number of posts at GED public awareness campaign social networks - 4,000 by project end (2018)

128. GED projects used multiple social media networks to advocate about its work and energy efficiency in general, including Facebook, Tweeter, YouTube (see Figure
129. Figure 11) with total number of posts gradually increasing from 700 in 2015 up to 1,000 in 2016. Achievement of the target is therefore on track.

Figure 11 GED Project on Social Media



130. Overall, implemented campaign is considered to be a successful one. Workshops in schools attracted a full attention of school representatives as well as children participating in the events. It is suggested to continuing with

this activity in the future, including more schools and children's all over Bosnia and Herzegovina. Also, summer open-air events attracted a lot of attention, especially due to the engagement of actor Dusko Mazalica who has been present at each event interacting with children, youth and parents. Contest for primary and high school clearly show that there are a huge potential among students in primary and secondary schools in BiH in field of science ideas development. Overall, the progress in achieving key indicators from the GED Results Framework is satisfactory, as summarized in the

131. Table 19.

132. The project has changed the perception and the business-as-usual practice concerning energy efficiency in the public sector. It also changed the awareness of and attitude to energy efficiency in the society through its wide-reaching information campaigns and outreach activities.

Table 19 Assessment of progress and results under Project Component 5

#	Indicator	2015	2016	2015-2016	Target: 2018	Progress status
5.1	Media campaign outreach achieved (seconds)	25,233	18,731	43,964	90,000	On-track
5.2	Number of awareness raising events	15	20	35	75	On-track
5.3	Number of promotional materials distributed	33,000	47,172	80,172	150,000	On-track
5.4	Number of people reached through campaign	350,000	500,000	850,000	500,000	Exceeded
5.5	Number of posts at GED public awareness campaign social networks	700	1,000	1,700	4,000	On-track

Visibility

133. Both GED project Document and Communication strategy clearly articulates provisions regarding project visibility: "GED project visibility will be ensured through consistent application of relevant UNDP corporate guidance and that of GED project donors and partners, including through the use of project partners' logos on all communication and promotional materials". Indeed, as evaluation team did observe during numerous project sites visits and inspection of relevant materials and products, visibility policies and branding guidance are being systematically applied (See for example Figure 12). It has however to be noted that one instance was observed when a UNDP sub-contractor was not aware on the project's visibility requirements and placed a plaque on the

project sites which was not complaint with the rules Figure 13. It is therefore important that not only GED project staff, but its sub-contractors as well were briefed and relevant provisions included in the contracts mandating suppliers to comply with project visibility policies and requirements.

Figure 12 Donor visibility in GED project

Figure 13 Example of non-compliance with visibility requirements

4.7. Sustainability

Sustainability provision in project design

134. The GED project document includes a separate chapter discussing the sustainability aspects. The aim of GED project is to ensure that savings generated through implemented energy efficiency infrastructure measures are continuously reinvested into other energy efficiency projects (or other infrastructure projects) thus providing for sustainable stream of finance for EE improvements in public sector. Specifically, it is stated that sustainability of the project will be ensured by:
    - Creation of energy efficiency revolving fund within Environment Protection Funds;
    - Sub-national government/end-user obligation to reinvest generated savings and/or to invest into other EE projects

- Law on Energy Efficiency, based on EU's EPBD and EED directives (which identifies Environmental Funds in both entities as responsible institutions to: i) monitoring energy consumption and savings, ii) supporting EE targets iii) supports the implementation of energy efficiency projects
- Selection of public sector buildings/decision making process on investments
- Complementary awareness raising and capacity building activities.

135. Overall, the approach of the initial project design to ensure the sustainability of the effort allows to comprehensively address underlying barriers to investment in public sector EE through appropriate policy and financial de-risking instruments, as well as complementary and targeted provision of investment support. It is in line with established international practices in the sector, as well as EU policies, and therefore can be considered as satisfactory.

Sustainability of achieved results

136. For sustainability, relevant UNDP Evaluation guidelines establish four areas for considering risks to sustainability, each of which should be separately evaluated and then rated as to the likelihood and extent that they will impede sustainability of the project outcomes. These risks include: 1) financial risks, 2) socio-economic risks, 3) institutional framework and governance risks; and 4) environmental risks.

137. Considering the financial risks, all public buildings with implemented EE measures have achieved targeted level of energy cost saving of 20%; in fact most of the building exceeded the target with 50% level of cost saving compared to baseline. This shall ensure availability of additional funding for continued investment in EE. In addition, GED project facilitated establishment of Revolving Funding windows under the Environmental Funds of FBiH and RS – the only dedicated source of financing for EE projects in public sector at appropriate terms for such investment. As such, the rating for project's financial sustainability at the outcome level is considered as Likely (L)

138. By looking at the issue from the future market growth point of view, it can be noted that certain type of EE projects in public sector will still require investment subsidies to make them viable, while certain projects (with short pay-back) can be implemented with involvement of private sector. Furthermore, the legislation in the FBiH enables multi-year heat supply contracts, which may make it easier for the public entities to leverage private sector financing for fuel-switch projects, which can be further explored and facilitated by the project.

139. For socio-economic risks, it can concluded that the current level of awareness about the benefits and possible ways of increasing efficiency of energy use in public sector is already at the high level due to wide-scale introduction of EMIS, as well as effective awareness campaign. The integration of concrete measures to support this awareness through the relevant Government policies, strategies, applicable incentives and other financial support is also evolving as evidenced by recent adoption of the EE Laws in both entities, as well as introduction of the

Revolving Funding windows by EFs. As such and similar to the rating of the financial sustainability, no major socio-economic risks are foreseen that would jeopardize achieved outcomes. Given the above, at the outcome level the socio-economic sustainability is considered as Likely (L).

140. For institutional framework and governance risks, the specific situation of Bosnia and Herzegovina consisting of two, largely autonomous political entities having its own regulations and administration governing environmental and energy issues with rather limited co-ordinations is placing some obstacles to the sustainability and effective follow-up of the project results at the national level. However, due in part also to project's efforts as well as BiH's commitments under the Energy Treaty and EU accession process, for the building sector, the approaches of the two political entities are sufficiently integrated and streamlined. Further, the strategy adopted by the GED project to work directly with local authorities is fully plausible. Again at the outcome level, no immediate institutional and governance risks are foreseen that would jeopardize the continuing implementation of EE investment in public sector. As such, the rating for sustainability versus this risk category at the outcome level is similar to the previous one i.e. Likely (L).

141. From the environmental point of view, there should be no environmental risks to the project sustainability since Project was designed to promote more effective use of fossil fuel resources and consequently GHG emission reduction from the public sector buildings. GED project collaboration with parallel Biomass Promotion Project implemented by UNDP is notable in this respect as it enabled integration of fuel-switch measures in targeted buildings thus further reducing environmental impact of buildings' energy use. It is therefore recommended that efforts to integrate more fuel-switch, in particular coal to biomass, in the scope of GED-supported investment be further promoted in the next phase of the project. At the outcome level the environmental risks are considered as negligible. Therefore, the rating Likely (L) for environmental sustainability at the outcome level.

142. Overall likelihood of sustainability of the project outcomes is therefore rated as Likely (L) – see Table 20.

Table 20 Assessment of project sustainability

Sustainability	Rating
Financial resources	Likely (L)
Socio-economic	Likely (L)
Institutional framework and Governance	Likely (L)
Environmental	Likely (L)
Overall likelihood of sustainability	Likely (L)

4.8. Comments on the Concept note for next phase of GED project

143. The concept note is attached in the Annex 6. The concept note recognizes the importance of addressing the relevant Sustainable Development Goals (SDG) as well as supporting BiH in its efforts to implement EU policies in energy field. The addressed SDGs are**:**

- SDG 5 – Achieve gender equality and empower all woman and girls
- SDG 7 – Ensure access to affordable, reliable, sustainable and modern energy for all
- SDG 11 – Make cities and human settlements inclusive, safe, resilient and sustainable
- SDG 13 – Take urgent action to combat climate change and its impacts

144. It is important that the full project document when developed have provisions for monitoring impact of project activities on the SDGs, and for evidence based reporting of results in line with Indicators and Monitoring Framework for SDG, as elaborated in the section 4.4. of this report. Further, impacts on other SDGs (SDG 1, SDG3, and SDG 4) can be considered.

145. This recommendation is also applicable to other project 'soft' activities, such as training, capacity building for local authorities, public awareness and communication.

146. The project will directly contribute to BiH's EU accession process and support BiH state and entity level Ministries to fulfil the Energy Community Treaty obligations of Bosnia and Herzegovina. Specifically, the project will support BiH to fulfil following EU directives:

- Energy Performance Building Directive - EPBD
- Energy Efficiency Directive - EED
- Renewable Energy Sources Directive – RESD

147. The concept note proposes continuity of project activities, which is important for achieving lasting EE market transformation in BiH.

148. Additionally, the concept note proposes introduction of activities related to use of renewable energy sources (RES), such as:

- Solar hot water systems in public sector buildings
- Solar public lighting systems
- Renewable energy solution to marginalized families living in rural areas off the power grid

149. Regarding street lighting system it is important to note that from a safety perspective, light from LED fixtures can be aimed and controlled to eliminate the dark spots and shadows that are common with more traditional metal halide or high-pressure sodium street lights. Also, modern solar LED street light may incorporate a small but high definition cameras which are important tools for increasing safety on less frequented roads, car parking's and parks, thus contributing to people's safety, and particular women security. Therefore, we support introduction of this new component into the project scope.

150. Having in mind that from 2018 all new public buildings in the EU will need to comply with Net Zero Energy Building (NZEB) standard, which of course includes use of RES in public buildings, we propose that the Project's

infrastructure component integrate EE and RES measures when planning retrofit of public buildings.

151. EMIS shall remain a backbone of the project implementation. A number of technical improvements for EMIS have been suggested by MTE team, as reflected in the recommendation's section of this report.

5. Conclusions and Recommendations

5.1. Conclusions

152. Overall impressions of project results achieved so far based on the documentary review, interviews with project stakeholders and site visits are positive. Project team is well structured and effective, the project interventions covered all geographical areas of BiH, the quality of work on visited site is good, and building users are satisfied with the improvements achieved, comfort levels increased and energy costs reduced.

153. Project has achieved or surpassed all targets which in itself is a reason for high ratings, but what is also important to emphasize is that the project's counterparts in Federation, RS and Kantons are also satisfied with joint work on the projects which they are co-financing.

154. Moreover, Kanton Sarajevo and Municipality of Teslić are already making plans to expand their activities beyond the scope of jointly financed projects. This is an important result for the Project in changing perception of local authorities toward EE in public buildings and it is a cornerstone for project sustainability.

155. EE Fund in Federation has introduced new financial mechanisms and EE Fund in RS is going to follow soon. Public awareness activities are changing perception of general public towards energy.

156. It can therefore be concluded that project has successfully initiated EE market transformation for public buildings and that it is on a strong path of achieving sustainability through further actions over the next 2-3 years.

5.2. Recommendations

157. ***Universal acceptance:*** Project should aim to achieve universal acceptance of EIMS as a tool for fostering EE in public buildings across both entities and all cantons, as well as on the state level

158. ***Extending coverage:*** In line with universal acceptance, Project should aim to spread retrofit project across all entities and cantons.

159. ***Enlarging scope of retrofit projects:*** n line with the EU EPBD directive which

requires that every new public building from the year 2018 has to be of Net Zero Energy Building Standard (NZEB), retrofit project should include appropriate RES measures and integrate them with EE measure aiming at achieve nearly NZEB standard.

160. ***Upgrading EMIS:*** EMIS platform is already of a mature age and requires face lifting both in terms of user-friendliness and functionality. The graphical user interface has to be upgrade in line with current similar products standards (GIS aspects, google map, satellite images of cites and buildings, interactive dashboard, etc.). In terms of functionally, an building energy intensity mapping feature should be added. Once all public buildings are entered in the data base, this feature will allow immediate colour coded insight into energy efficiency of individual buildings. Another additional function should be for monitoring, verification and reporting of savings achieved in support for performance based granting and ESCO business model.

161. ***Adding street lighting:*** Street lighting efficiency improvement is very important for municipalities because public lighting accounts for signficant part of municipal budgets, but also because efficient lighting is critical for creating safe and comfortable public space and living environment for the citizens. Therefore street light module should be added to EMIS.

162. ***Supporting Energy performance certificates (EPC):*** EPC are gaining acceptance and certification process is going to expand. In order to provide support for relevant Ministries for monitoring the process and assuring quality of accredited certificators work, EMIS should be extended with a module which supports related colocations for preparation EPC in an objective, transparent and comparable manner.

163. ***SDGs:*** develop and implement monitoring framework to regularly monitor and assess SDG-related benefits of the project interventions, at the level of individual investment sub-projects and broadly for the whole project.

164. ***Gender:***
    - Gender analysis: to understand the specific aspects of gender inequality, if exist, in the context of buildings energy (in)efficiency is concerned, and the social, economic and political factors underlying such inequalities, as well as the potential contributions of women and men to societal changes required to promote investment in energy efficiency;
    - Gendered actions: identify and incorporate in the project design specific methods and tools to promote greater gender equality and reduce gender disparities in GED project activities.
    - Gender-sensitive M&E: propose and measure the outcomes and impacts of project activities on women and men's through gender- responsive M&E. It is suggested that all Project Components of the GED project to include at least one gender-related indicator, as elaborated in
    - Table .

165. ***Communication:***
    - Integrate in the scope of communication strategy and plan impact monitoring, in terms of improved awareness and behavioural changes among various targeted categories. In particular, the focus on monitoring changes in awareness and motivation among investment decision-makers could be additionally assessed and monitored
    - Put more emphasis on communicating sustainable development impacts of EE investment (i.e. those which go beyond budgetary and energy saving), in particular such aspects as improved comfort and occupancy conditions for building users, health and education impacts of such investment, as well as gender dimension (see also recommendations from the gender section)
    - Prepare and make publicly available information about investment projects in the form of simple fact sheets containing key information about achieved results, as well as visual (like "before and after" pictures)
    - Every retrofit project upon completion should be described in simple fact sheet as a particular case study.

166. ***Donor's visibility:*** Project should take care that on all project documents – intermediary and final – donor visibility requirements are properly observed. Also, it is important to make sure that all sub-contractors are duly informed about project's visibility requirements and relevant provisions are incorporated in the TORs and sub-contracts. Nominate dedicated GED project staff member to regular monitor compliance of sub-contractors with such requirements.

6. Annexes

6.1. Annex 1: Mission agenda

Monday 14.08.2017. (Sarajevo)

- UNDP – Q&A discussion GED project
  09:00h
- SIDA - Briefing on mission/MTR goals
  (**Marie Bergstrom**, Head of Cooperation, **Aiša Bijedić**, Env & CC Programme Officer)
  15:00h

Tuesday 15.08.2017. (Sarajevo)

- Environmental Fund of FBiH
  (**Jasmina Kafedzic**, Head of EE Department)
  08:00h
- Ministry of Spatial planning and environment of Canton Sarajevo
  (**Cedomir Lukic**, Minister)
  09:30h
- WB loan PIU FBiH / Ministry of spatial planning FBIH
  (**Mustafa Copelj**, BEEP FBiH Coordinator, **Jasmina Katica**, Head of EE Depart.)
  11:00h
- CzDA/UNDP's Biomass project
  (**Amila Selmanagic Bajrovic**, as UNDP PM for Biomass project)
  12:30h
- GiZ
  EE project (**Goran Krstovic**, Head of project)
  14:30h
- USAiD EIA project
  (**Mak Kamenica**, Deputy Chief of Party)
  16:00h

Wednesday 16.08.2017. (Sarajevo - trip to Banja Luka)

- Dom Bjelave, Sarajevo
  08:30 – 09:30
  (09:30 – 11:00 trip from Sarajevo to Nova Bila)
- Hospital Nova Bila, Nova Bila
  11:00 – 12:00
  (12:00 – 13:00 lunch break)
  (13:00 – 16:00 trip from Nova Bila to Teslic)
- Kindergarden "Palcic" Teslic
  Mr. Misic (Local Community representative) and Mayor of Teslic Mr. Milicevic
  16:00 – 17:00
  (17:00 – 18:30 trip from Teslic to Banja Luka)

Thursday 17.08.2017. (Banja Luka – trip to Sarajevo)

- Environmental & EE Fund of RS
  (**Srdjan Todorović**, Director)
  09:00h
- WB loan PIU RS / Ministry of spatial planning RS
  (**Miloš Jokić**, Assistant Minister)
  10:30h

- Public sector building / end-users, Banja Luka (PMF) meeting
  12:00h
- Ministry of Spatial planning and civil engineering of West Herzegovina Canton
  (**Miroslav Ramljak**, Minister)
  13:30h

Friday 18.08.2017. (Sarajevo)

- De-briefing @ UN House
  UNDP DRR/E&E Sector Leader/SIDA
  09:00h
- MoFTER
  (**Admir Softić**, Assistant Minister)
  11:00h
- EU Delegation in BiH
  (**Amila Ibričević**, Political Adviser - Political and Economic Affairs)
  12:30h

6.2. Annex 2: Energy and cost saving and GHG emission reduction

rb	Objekat	CO2 savings [tCO2/m2] a	Energy savings [kWh/m2 a]	Cost savings [BAM/m2 a]	CO2 savings [tCO2/ a]	Energy savings [kWh/a]	Cost savings [BAM/a]	Površina [m^2]
1	OŠ \Rapatnica\""	-0,051809	-152,10	-3,86	-101,03	-296 592,09	-7 535,27	1 950,00
2	OŠ \Duboki Potok\""	0,001379	-18,08	1,02	2,96	-38 879,27	2 182,62	2 150,00
3	Srednja strukovna škola Orašje	0,008740	23,51	5,30	34,96	94 040,69	21 204,80	4 000,00
4	OŠ \Lukavac Mjesto\""	0,046594	129,61	5,00	97,13	270 200,27	10 423,58	2 084,68
5	ZU Dom zdravlja Velika Kladuša - kompleks	0,013830	-10,57	2,39	78,18	-59 759,51	13 534,07	5 653,00
6	JU Dječije obdanište i Dom učenika	0,004583	-32,28	6,81	3,99	-28 084,26	5 922,89	870,00
7	\Druga osnovna škola - Bosanska Krupa	0,010509	-3,28	4,68	38,57	-12 034,78	17 181,46	3 670,00
8	JU Dječije obdanište \Hasnija Omanović\""	0,025293	25,16	6,62	23,32	23 200,79	6 103,16	922,00
9	Mješovita srednja škola Sanski Most	0,007384	134,40	3,86	38,16	694 454,82	19 962,99	5 167,00
10	OŠ \5. oktobar\""	0,013449	52,25	1,31	33,89	131 675,36	3 309,72	2 520,00
11	JU Mješovita srednja škola Ključ	0,001025	-1,33	-0,14	8,55	-11 117,45	-1 199,34	8 341,00
12	OŠ \Bužim\" "	0,067635	357,46	20,40	68,18	360 320,44	20 565,34	1 008,00
13	JU Centar \Los Rosales\""	0,007701	2,45	2,44	17,22	5 486,72	5 461,46	2 235,40
14	Centar za stara i iznemogla lica - Radna jedinica 1	0,017466	53,94	14,26	27,37	84 530,48	22 346,52	1 567,00
15	\Dječiji vrtići Mostar\" - \"Radobolja\""	0,009158	26,61	11,97	10,20	29 633,44	13 327,53	1 113,60
16	Prva osnovna škola Široki Brijeg	0,003338	7,15	1,40	11,54	24 705,89	4 825,09	3 457,00
17	Prva osnovna škola, PŠ Mala škola	0,011419	27,52	9,63	8,56	20 642,32	7 224,24	750,00
18	OŠ \Ante Brune Bušića\" Rakitno"	0,016935	-29,43	8,93	28,96	-50 319,12	15 270,43	1 710,00
19	OŠ \Franice Dall\"era\" Vir"	0,004669	11,00	2,11	10,82	25 489,54	4 883,50	2 317,25
20	Zgrada općine Posušje	0,016718	-38,27	7,36	23,24	-53 195,18	10 225,80	1 390,00
21	OŠ \Ivana Brlić Mažuranić Ljubuški	0,013356	28,63	7,39	32,16	68 937,23	17 789,27	2 408,00

22	Dječiji vrtić Ljubuški	-0,017158	-62,07	-6,26	-14,76	-53 380,64	-5 384,20	860,00
23	OŠ \Ruđer Bošković\""	0,007076	18,07	8,64	15,60	39 841,05	19 036,92	2 204,57
24	Dom za socijalno i zdravstveno zbrinjavanje osoba sa invaliditetom i drugih osoba Stolac	0,019684	48,14	9,04	64,96	158 866,53	29 825,17	3 300,00
25	JU Dječije obdanište \Zulejha Begeta\""	0,006913	78,52	8,69	4,65	52 765,39	5 842,53	672,00
26	KJU Dom za djecu bez roditeljskog staranja Bjelave	0,055234	196,34	26,79	132,56	471 224,04	64 291,87	2 400,00
27	Općina Novo Sarajevo	0,019684	48,14	9,04	101,33	247 831,79	46 527,27	5 148,00
28	OŠ \Aleksa Šantić\""	0,010966	-28,44	4,47	31,87	-82 636,73	12 992,66	2 906,15
29	OŠ \Hasan Kikić\" "	0,106745	343,23	13,57	157,77	507 286,68	20 049,40	1 478,00
30	JU za predškolski odgoj i obrazovanje - vrtić \Dunja\""	-0,006330	-50,19	2,32	-7,72	-61 178,76	2 829,46	1 219,00
31	Hrvatska Bolnica Dr. fra Mato Nikolić	0,034176	74,57	23,13	303,76	662 743,23	205 565,59	8 888,00
32	\Dječiji Vrtić\" Novi Travnik"	0,003119	5,60	4,16	3,01	5 400,98	4 010,55	964,85
33	JZU Kantonalna bolnica Goražde	0,019684	48,14	9,04	141,72	346 617,89	65 073,10	7 200,00
34	OŠ \Fahrudin Fahro Baščelija\""	0,046313	167,58	37,68	143,57	519 497,09	116 808,73	3 100,00
35	Zgrada Općine Maglaj	0,025143	12,54	16,78	36,84	18 377,59	24 587,21	1 465,00
36	JU Dom zdravlja Maglaj	0,019149	10,09	8,77	61,28	32 274,48	28 061,54	3 200,00
37	MSŠ Maglaj i gimnazija \Edhem Mulabdić\""	0,019684	48,14	9,04	92,59	226 457,02	42 514,43	4 704,00
38	OŠ \Maglaj\" - Zgrada 1"	0,019684	48,14	9,04	36,18	88 493,47	16 613,52	1 838,20
39	OŠ \Maglaj\" - Zgrada 2"	0,019684	48,14	9,04	17,72	43 327,24	8 134,14	900,00
40	Prva osnovna škola Maglaj	0,015252	29,53	12,77	45,76	88 594,83	38 320,12	3 000,00
41	JU Dječiji vrtić Maglaj	0,000000	46,29	3,10	0,00	55 542,43	3 717,94	1 200,00
42	Dječiji vrtić \Sunčani most\""	0,089555	42,68	18,57	25,77	12 280,76	5 344,05	287,72
43	OŠ "Orašje"	0,019684	48,14	9,04	38,88	95 079,21	17 849,91	1 975,00
44	NK Zvijezda Gradačac	0,019684	48,14	9,04	134,83	329 768,41	61 909,82	6 850,00
45	OŠ "9. maj", Pazarić	0,019684	48,14	9,04	36,81	90 024,37	16 900,93	1 870,00
46	Dom zdravlja Vogošća	0,019684	48,14	9,04	75,07	183 590,98	34 466,87	3 813,58
47	JU "Druga osnovna škola" Hrasnica	0,019684	48,14	9,04	69,76	170 606,77	32 029,25	3 543,87
48	OŠ "Fatima Gunić"	0,019684	48,14	9,04	97,13	237 551,68	44 597,31	4 934,46

49	JU Pozorište mladih Sarajevo	0,019684	48,14	9,04	30,25	73 983,18	13 889,40	1 536,79
50	OŠ "Mirsad Prnjavorac"	0,019684	48,14	9,04	31,57	77 218,76	14 496,84	1 604,00
51	OŠ Kočerin, Široki Brijeg	0,019684	48,14	9,04	35,71	87 347,71	16 398,42	1 814,40
52	OŠ "Antuna Branka i Stanislava Šimića" PŠ "Tihaljina"	0,019684	48,14	9,04	42,44	103 792,80	19 485,78	2 156,00
53	OŠ "Tin Ujević" PŠ "Grab"	0,019684	48,14	9,04	5,39	13 190,74	2 476,39	274,00
54	Gimnazija fra Grge Martića Posušje, Srednja škola Posušje i Osnovna glazbena škola Posušje	0,019684	48,14	9,04	78,24	191 361,96	35 925,77	3 975,00
55	Općinski sud Goražde	0,019684	48,14	9,04	21,91	53 593,87	10 061,57	1 113,26
56	Zgrada Vlade BPK	0,019684	48,14	9,04	31,49	77 026,20	14 460,69	1 600,00
57	Srednja stručna škola "Džemal Bijedić"	0,019684	48,14	9,04	30,43	74 426,56	13 972,64	1 546,00
58	Obdanište "Travnik" i Centar za socijalni rad Travnik	0,019684	48,14	9,04	20,61	50 404,02	9 462,71	1 047,00
59	OŠ "Todorovo" Velika Kladuša	0,019684	48,14	9,04	41,89	102 444,84	19 232,72	2 128,00
60	OŠ "Konjodor" Bužim	0,019684	48,14	9,04	25,45	62 246,80	11 686,04	1 293,00
61	Mješovita srednja škola "Safet Krupić"	0,019684	48,14	9,04	57,87	141 535,64	26 571,52	2 940,00
62	OŠ "Gornja Koprivna" Cazin	0,019684	48,14	9,04	47,60	116 405,84	21 853,72	2 418,00
63	OŠ "Domanovići" Čapljina	0,019684	48,14	9,04	19,68	48 141,37	9 037,93	1 000,00
64	Masinski fakultet Sarajevo	0,019684	48,14	9,04	9,84	24 070,69	4 518,97	500,00
65	OŠ "Ivana Mažuranić" - Posušje	0,019684	48,14	9,04	76,06	186 018,27	34 922,56	3 864,00
66	OŠ Borisav Stanković	0,019684	48,14	9,04	102,36	250 328,00	47 008,00	5 200,00
67	OŠ Dositej Obradović	0,019684	48,14	9,04	58,85	143 938,60	27 029,60	2 990,00
68	JU Naša radost - vrtić Gorica	0,019684	48,14	9,04	6,30	15 404,80	2 892,80	320,00
69	Vrtić "Palčić" Teslić	0,019684	48,14	9,04	22,54	55 120,30	10 350,80	1 145,00
70	Zgrada Opštine Nevesinje	0,019684	48,14	9,04	31,49	77 024,00	14 464,00	1 600,00
71	Muzička škola "Vlado Milošević" Banja Luka	0,019684	48,14	9,04	43,30	105 908,00	19 888,00	2 200,00
72	OŠ "Sveti Sava" PŠ "Lipac" Doboj	0,019684	48,14	9,04	2,76	6 739,60	1 265,60	140,00
73	Dom zdravlja Drinić	0,019684	48,14	9,04	5,51	13 479,20	2 531,20	280,00
74	Zgrada opštine Drinić	0,019684	48,14	9,04	14,47	35 382,90	6 644,40	735,00

75	OŠ Aleksa Šantić Banja Luka	0,019684	48,14	9,04	49,25	120 446,28	22 618,08	2 502,00
76	Srednjoškolski centar Mrkonjić Grad	0,019684	48,14	9,04	78,22	191 308,36	35 924,96	3 974,00
77	Srednjoškolski centar "Nikola Tesla" i "Jovan Dučić", Teslić	0,019684	48,14	9,04	105,05	256 923,18	48 246,48	5 337,00
78	OŠ "Jovan Jovanović Zmaj" Trebinje	0,019684	48,14	9,04	60,74	148 560,04	27 897,44	3 086,00
79	OŠ "Sveti Sava" Bileća	0,019684	48,14	9,04	59,05	144 420,00	27 120,00	3 000,00
80	OŠ "Sveti Sava", Brod	0,019684	48,14	9,04	106,78	261 159,50	49 042,00	5 425,00
81	SŠ "28.juni" Istočno Novo Sarajevo	0,019684	48,14	9,04	35,25	86 218,74	16 190,64	1 791,00
82	Studentski centar, Akademija likovnih umjetnosti i Fakultet za proizvodnju i menadžment, Trebinje	0,019684	48,14	9,04	12,97	31 724,26	5 957,36	659,00
83	Prirodno-matematički fakultet Banja Luka	0,019684	48,14	9,04	62,89	153 807,30	28 882,80	3 195,00
84	JZU Bolnica Sveti apostol Luka - objekat 1, 2 i 3	0,019684	48,14	9,04	173,06	423 246,88	79 479,68	8 792,00
85	JZU Univerzitetska bolnica Foča	0,019684	48,14	9,04	334,62	818 380,00	153 680,00	17 000,00
86	OŠ Pale	0,019684	48,14	9,04	61,61	150 678,20	28 295,20	3 130,00
	AVERAGES	**0,018950**	**45,18**	**8,77**	**50,90**	**124 925,48**	**24 527,78**	**2 773,45**
	TOTALs	**1,629712**	**3 885,69**	**754,06**	**4 377,39**	**10 743 591,50**	**2 109 388,66**	**238 516,78**

6.3. Annex 3: Energy Management Information System (EMIS)

About EMIS

Energy Management Information System (EMIS) is web based application for tracking, analysing and evaluating energy and water consumption in public sector buildings. Application as such represents necessary tool for energy management. Energy management includes strategic planning and sustainable management of energy resources. For buildings owned by the public sector; municipalities, cantons and entities (administrative buildings, hospitals, schools, etc.), the person responsible for managing energy, input relevant information about buildings that are under their jurisdiction. In compliance with the level of responsibility, each user is assigned certain rights in the software (guest, user, manager, administrator etc.).

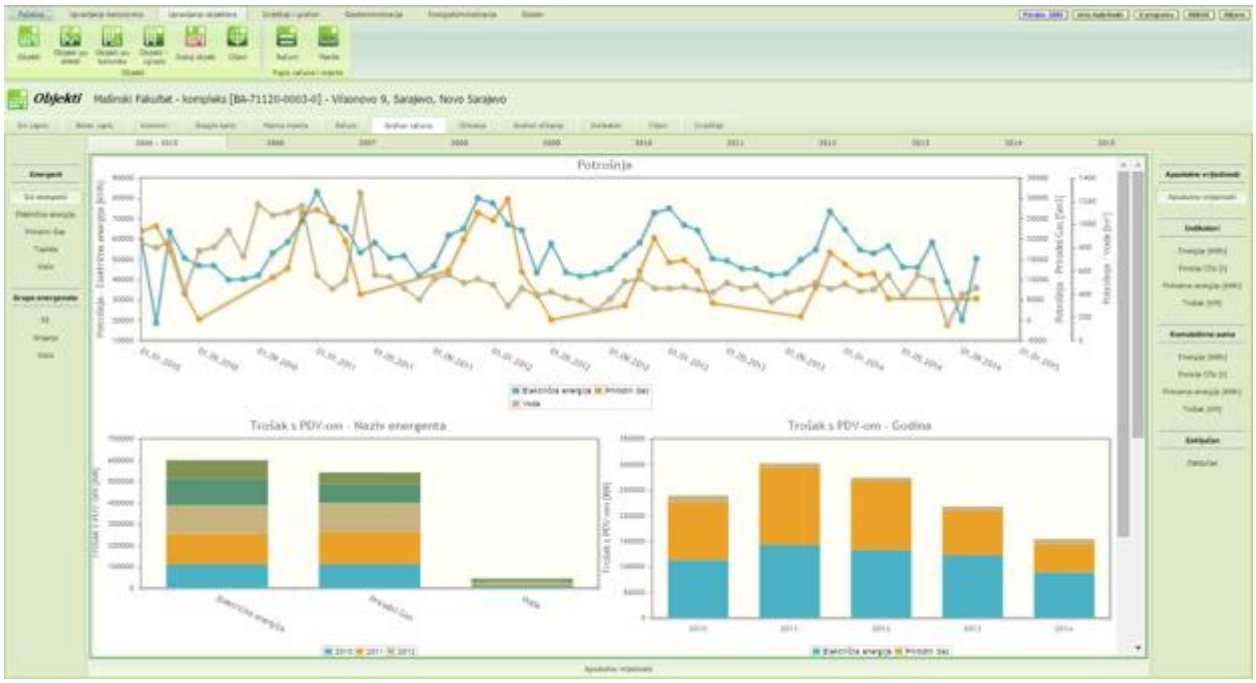
The EMIS users first enter static information about the building, which include construction and energy properties of the building. Then monthly consumption data is entered based on the utility bills that are delivered. Also, there is an option to add additional (more frequent) consumption data for each building. This data is either entered manually, by reading it from the meters/energy bills, or automatically by installing automatic remote metering systems, which can provide hourly consumption data directly to EMIS.

Data entered into system is used for calculating, analysing and control and enables a better understanding of where, when and how we consume energy and water in buildings. It also allows comparison of spending between the selected buildings as well as the identification of unwanted and excessive spending.

EMIS greatly eases the process of systematic energy management in public sector buildings, in a way which allows easier access to information on consumption and energy costs. It provides a simple graphical representation or a tabular presentation of the data collected as a result of predefined analysis. Continuous monitoring of expenditure through EMIS provides a transparent view and control of energy consumption, energy savings, emission and emission reduction in public sector buildings. Main functionalities of EMIS (more info under www.isge.ba) are:

- Collect and enter basic information about the buildings and the control of energy and water consumption on a monthly, weekly and daily basis
- Easy access to information on energy use, consumption patterns and places of consumption
- Calculations and analysis of consumption for the purpose of identifying unwanted and excessive consumption of energy and water, as well as identifying opportunities to increase energy and financial savings

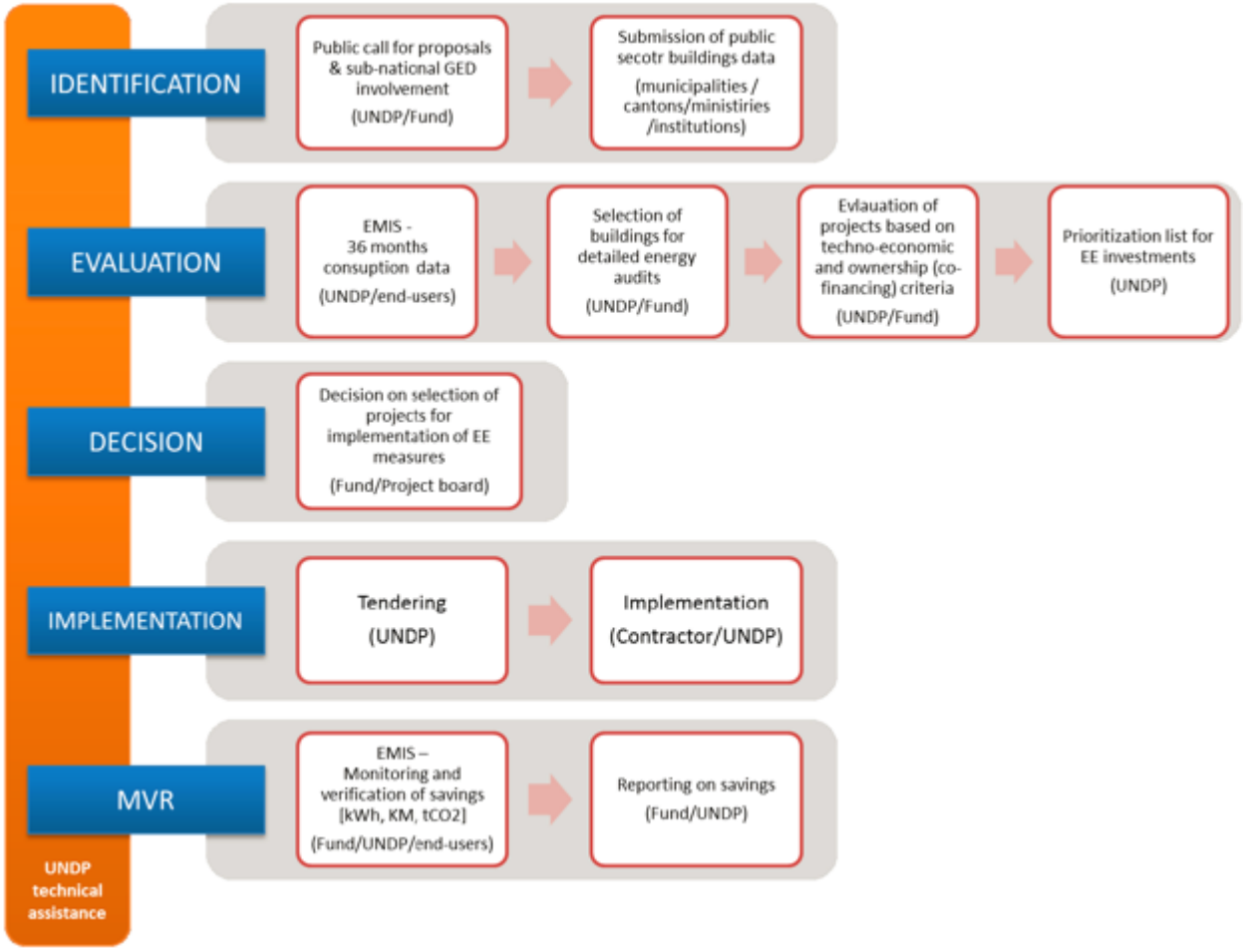
- Verification of realized energy and water savings (kWh, BAM, tCO_2, and any other standardized indicator)
- Calculation of various consumption indicators
- Automatic notification of accomplished goals or unwanted consumption
- Different options for different levels of users
- Advanced database filtering
- Easy export of data info PDF or Excel formats
- Filtering based on building type



Detailed description of methodology on selection of public sector buildings for implementation of energy efficiency infrastructure measures

Under the GED project activities, the Methodology on selection of public sector buildings for the implementation of measures to increase energy efficiency has been developed and its validity justified in 2013 on activities conducted within Environmental Protection Fund of FBiH. Activities conducted during the implementation of the given Methodology contribute to increase internal capabilities, skills and develop capacities within Environmental Protection Funds on strategic approach to energy efficiency investment decision making.

Key Methodology steps are given below.



1. STEP – Identification

1.1. **Call for proposals** - announcement of Call for Proposals with incorporated Questionnaire on basic information of end-user's public sector buildings (Fund/UNDP)

1.2. **Submission of proposals by end-users (municipalities, institutions) /sub-national GED partners (cantons, ministries)**

2. **STEP – Evaluation**

2.1. **Entering basic data of public sector buildings into EMIS database** – based on submitted questionnaire, entering basic characteristics (square meters, square meters heated, building type, energy carrier type, etc.) into database, as well as data on energy and water consumption for the past 36 months (data collected, codified and entered into EMIS by UNDP)

2.2. **Selection of public sector buildings for development of detailed energy audits** – based on developed prioritization list with key energy conservation potential indicators (energy carrier, type of heating/cooling system, net heated square meters, average energy cost [BAM/m^2], specific heat consumption kWh/m^2, specific emission of tCO_2/m^2), public sector buildings will be chosen on annual basis for conducting detailed energy audits (UNDP/Fund)

2.3. **Analysis and evaluation of detailed energy audits** – based on energy audits results, e.g. techno-economic, environmental, financial and co-financing criteria, all public sector buildings will be evaluated against each other in order to develop a ranking list of most cost-effective energy conservation investments. (UNDP/Fund)

2.4. **Development of ranking list** – based on detailed energy audits findings, as well as further conducted evaluation of energy, environment, economic and financial parameters a ranking list of most cost-effective energy conservation investments will be developed. (UNDP/Fund)

3. **STEP – Decision**

3.1. **Decision on co-financing energy efficiency investments of public sector buildings** – based on completed evaluation and recommended ranking list, decision on co-financing energy efficiency investments of public sector buildings will be made. (Project Board)

4. **STEP – Implementation**

4.1. **Contracting/Procurement** - proceeding procurement of services and works of selected projects/implementation of EE infrastructure projects (UNDP)

4.2. **Implementation and monitoring** - Implementation of EE infrastructure projects by contractors (including supervision as per Law), investor supervision and QA by UNDP

5. **STEP – Monitoring, verification and reporting (MVR)**

5.1. **Monitoring and verification of savings and consumption**– clear identification of energy and expenses savings (kWh, BAM, tCO2, specific energy consumption...) through automatic analysis of energy consumption

and energy consumption indicators data, processed in EMIS software (UNDP/Fund/end-user)

5.2. **Reporting** – development and drafting of comprehensive reports with information on reduced energy consumption, costs, and emission

6.4. Annex 4: Concept note

Concept note for the project:

„Green Economic and Human Development"

Project information:

- Duration: 3 years, 2018 – 2020.
- Budget: 3 m €
- Project Board members: SIDA/Sweden, MoFTER, Environmental Fund of FBiH and Environmental Fund of RS

Areas of work:

- Renewable energy sources and Energy efficiency
- Environment / Pollution prevention
- Human development

Sustainable Development Goals:

- SDG 5 – Achieve gender equality and empower all woman and girls
- SDG 7 – Ensure access to affordable, reliable, sustainable and modern energy for all
- SDG 11 – Make cities and human settlements inclusive, safe, resilient and sustainable
- SDG 13 – Take urgent action to combat climate change and its impacts

EU Directives:

The project would directly contribute to BiH's EU accession process and would continue to support BiH state and entity level Ministries to fulfil the Energy Community Treaty obligations of Bosnia and Herzegovina. Moreover, as UNDP CO BiH is a member of the Energy Community Secretariat's Coordination Group on renewable energy and energy efficiency, all project goals and results will be coordinated with the Secretariat (for example, GED project results are presented on annual basis to Energy Community Secretariat and its results are presented in official Energy Community Secretariat Annual Reports). The "Green Economic and Human Development" project would support BiH to fulfil following EU directives:

- Energy Performance Building Directive - EPBD
- Energy Efficiency Directive - EED
- Renewable Energy Sources Directive – RESD

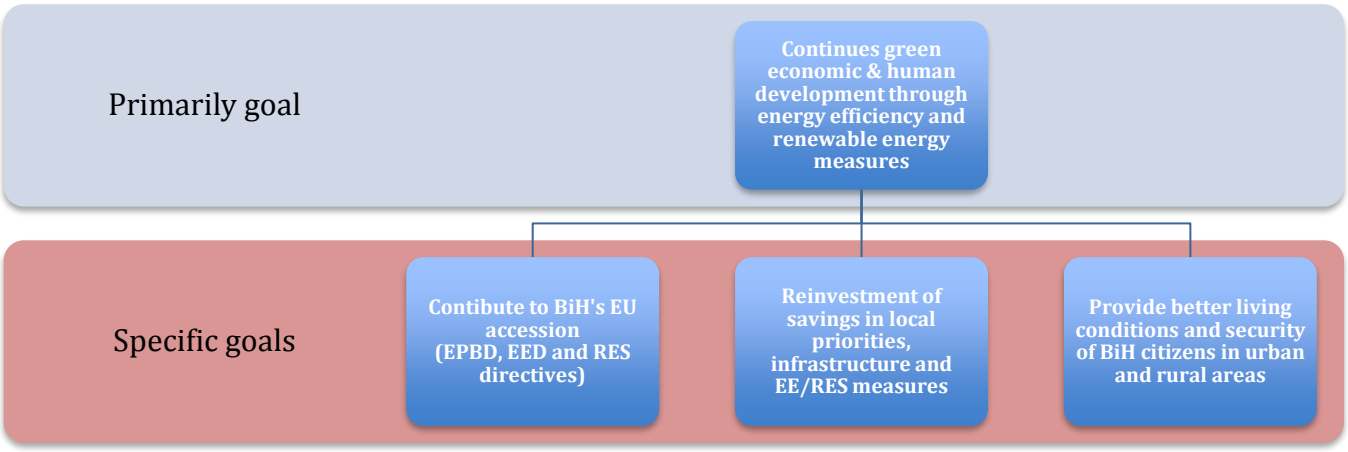
Project goal:

The primarily goal of **Green Economic and Human Development** project is to assure continues green economic and human development through self-

sustainable energy efficiency and renewable energy financing mechanisms with the goal to provide better living conditions of BiH citizens in urban and rural areas.

Specific project goals:

i. Create understanding within municipal authorities and various government levels in BiH on human development benefits of energy efficiency and renewable energy projects.
ii. Embed human development goals into energy efficiency and renewable energy (energy management) planning within following sectors - public sector buildings, public lighting systems and residential sector (i.e. households /marginalized families living in rural areas off the power).
iii. Institutionalize energy monitoring and reporting mechanisms / energy management on municipal level for public sector buildings and public lighting (and thus cover all authorities' levels in BIH, i.e. GED project covered all entity and cantonal public sector buildings.
iv. Develop and adopt self-sustainable financial mechanism within Environmental Protection Funds in BIH for green economic and human development through energy efficiency and renewable energy project financing.
v. Capture and monitor human development indicators systematically and continuously within EE RES projects.
vi. Achieve budget cost savings through implementation of i) renewable energy projects in public sector buildings, and ii) energy efficiency projects in public lighting systems and reinvest savings into other infrastructure projects.
vii. Generate employment of domestic workforce.
viii. Increase public awareness and understanding of human development as a result of renewable energy and energy efficiency project benefits.
ix. Contribute to BiH's EU accession (EPBD, EED and RES directives).
x. Contribute to BiH's achievement of Sustainable Development Goals.



Project components:
Given the logic, interlinkage and achievements of the GED project, the **Green Economic and Human Development** project would also consist of five project components, i.e.:

- **Capacity Building (PC1)** – Development and capacity building of municipal authorities, Environmental Funds and energy professionals on energy efficient public lighting systems and renewable energy sources and human development benefits of EE/RES projects.

- **Institutionalization of energy management (PC2)** – Institutionalization of energy, costs and GHG emission management and monitoring in BiH municipalities (the GED project previously covered the entity (RS and FBIH) and cantonal level (FBiH)).

- **Development of financial mechanisms for green economic financing in BiH (PC3)** – Development and adoption of sustainable financial mechanisms within Environmental Protection Funds on energy efficiency and renewable energy sources which are based, contribute and capture/monitor environmental and human development.

- **Human development oriented RES/EE infrastructure projects (PC4)** – Implementation of:
  i) energy efficient public lighting systems in BiH municipalities,
  ii) solar systems at public sector buildings in BiH municipalities,
  iii) hybrid photovoltaic and solar system (electricity and thermal heat generation) in remote areas (not connected into the electricity grid) without electricity in BIH.

- **Public awareness / marketing campaign (PC5)** – increasing public awareness on human development as a result of clean/renewable energy and on energy efficiency.

Correlation of the Human Development concept and proposed project activities:

While the project focuses on economic development and its environmental and green economic effects generated through EE and RES investments and the enabling of a favorable investment environment, it also introduces human development resulting as the effects of those investments and environmental benefits. Through the goals of this project the project activities will mainstream an investment decision making process which includes human development criteria and its effects of human development correlated to EE and RES investments (resulting in emission reduction) in the following sectors - public sector buildings, public lighting systems and residential sector (households /marginalized families living in rural areas off the power grid), specifically aiming at improving working conditions in administrative, educational and healthcare buildings, improve education conditions of children, improve safety of street movement of women and children (local population in general), directly contribute to reduce air pollution, and provide electricity and thermal heat for households/marginalized families living in rural areas. Furthermore, one of the key goals is also to capture and monitor not only environmental but also human development indicators systematically and continuously within EE and RES projects in the aforementioned sectors which are financed by/through local, cantonal and entity level authorities.

Human development oriented RES/EE infrastructure projects
The human development oriented RES/EE infrastructure projects have the aim to:

- Introduce human development perspective into RES/EE decision making procedures
- Introduce human development perspective into RES/EE results monitoring
- Contribute to better living, working, safety and health conditions of BiH citizens
- Reduce pollution in urban areas in BiH
- Contribute to higher utilization of BiH's renewable energy/clean energy potential (i.e. higher RES portfolio of BiH)
- Assure cost savings of institutions and reinvestments into other priority areas/infrastructure projects
- To ensure renewable energy solution (electricity and thermal heat generation) for households/marginalized families living in rural areas off the power grid

To ensure the above stated results, four types of RES/EE infrastructure projects will be implemented, i.e.:

- *Solar hot water systems in public sector buildings*
- *Solar public lighting systems*

- *Renewable energy solution to marginalized families living in rural areas off the power grid*
- *Implementation of infrastructural energy efficiency measures in public sector buildings*

Solar hot water systems in public sector buildings
Under the current portfolio of the Green Economic Development project, in over 100 public sector buildings energy efficiency measures have been implemented and energy savings achieved through insulated building walls and roofs, high-performance windows, new biomass boilers, new high-efficient pumps, thermostatic valves and reconstruction of lighting systems. In only two buildings solar hot water systems have been implemented, enabling significant reduction of energy consumption. However, a large energy saving potential remained unused together with unrealized environmental benefits which could be obtained by implementation of these projects. Solar hot water systems do not pollute and they are helping to avoid carbon dioxide, nitrogen oxides, sulfur dioxide, and the other air pollution and wastes created when the local utility generates power or fuel is burned to heat domestic water. Solar hot water systems would be connected to existing building heating systems as back-up, when solar energy is not available or when hot water demand exceeds the solar-heated supply. Solar water heating systems, can efficiently serve up to 80% of hot water needs depending on location and surroundings, and in systems that combine water and space heating called Solar Combi Systems, can provide up to 30% of total space heating demand, with no fuel cost or pollution and with minimal operation and maintenance expenses.

Solar public lighting systems
Solar public lighting systems are powered by photovoltaic panels generally mounted on the lighting structure or integrated in the pole itself. Energy generated by the photovoltaic panels is stored in batteries, which are then used to power the LED lights at night. By this activity, targeted will be areas that have an existing public lighting infrastructure, with inefficient light bulbs, in which cost of regular maintenance and repair of those systems could be sidestep by installing solar LED fixtures. When solar energy is not available or there is not enough stored energy in batteries, solar public lighting system will be use grid electricity from existing public lighting infrastructure. Public lighting (beside heating energy costs) is one of the biggest expenses for a communities/local government budgets, and implementation of the solar LED lighting projects could permanently reduce budget expenses through monthly savings on utility bills up to 60%. During planning phase, attention will be paid on possible street lighting control and smart management system which will enable additional savings and environmental benefits.

Renewable energy solution to marginalized families living in rural areas off the power grid
Almost 3,000 households in the country live without electricity. For illustration, a village in North-West BiH (Veliko Ocijevo), with some 20 households, would need a total of 350,000 € to be connected to the electricity grid. UNDP, through past initiatives implemented a Global Renewable Energy Challenge in 2012

seeking renewable energy solutions for war-returnee/marginalized families living in rural areas off the power grid. The successful proposal had to cover the energy needs of an average family and cost only 5,000 Euros, more than 3 times cheaper than what it would cost for commercial electricity installation. It also had to be flexible, reliable, easy to install, maintain and replicate, with good battery life and hot water capacity, and low maintenance costs. The result was a solar unit that actually provided more energy (2kW) and longer battery storage capacity (4.65 days) than specified by specified. Since then, installed renewable energy kits have transformed 44 families' lives, and have helped them supplement their income by selling cheese and other dairy products, which was impossible before the renewable energy system was installed. Now, children in these families do not have to do their homework or study under the candle light, but proper energy efficient light bulbs, they can enjoy watching TV or listen to music as their peers do in other parts of the country. The village of Veliko Ocijevo became first community living 100% on renewable energy. This approach would be replicated to other parts of BiH. (more info under the link/video: https://www.youtube.com/watch?v=DJ6FHhqQE1A)

Implementation of infrastructural energy efficiency and renewable energy measures in public sector buildings

On the basis of detailed energy audits findings (technical, economic and environmental parameters) developed under the GED project, as well as other projects in BiH, infrastructure measures will be implemented in public sector buildings in order to conduct so called "Deep retrofits") and respecting newly developed and adopted construction and energy conservation standards (EPBD directive). Based on the findings from the GED project, the average energy and cost savings amount about 55% annually. The decision making procedure will include human development criteria (to be developed and introduced within Environmental Funds and municipalities).

Additional project co-financing

Additional project financing would be ensured by local project partners and end-users (municipalities and cantonal/entity institutions). Based on current activities and empirical experience on co-financing amounts from end-users, it is expected that SWEDEN's grant financing involvement would unlock additional funds for infrastructure investments in the matching ratio of minimum 1:1, or leveraging funds of minimum up to two times. Therefore, the maximum co-financing threshold by SWEDEN would be up to 50%. The table below shows the continues increase of the co-financing ratio by end-users, enabled through SWEDEN's involvement in GED project which is a reflection of not only the level of understanding cost-benefits of energy efficiency investments but also the end-users'/institutions' readiness to timely plan and execute these projects.

	Co-financing ratio by end-users	Total investment into EE infrastructure [USD]
2013	24%	571,531
2014	40%	522,021
2015	54%	2,742,865
2016	62%	3,192,317

2016* (including cooperation with BEEP project in RS)	73%	5,674,914

Linkages among project activities

All project components and their planned activities are interlinked and tackle monitoring, legislation, infrastructure, capacity building and raising awareness activities. The linkages will be in more detail described in Project Document.

Gender mainstreaming

To ensure this project's successful implementation and long-term sustainability it is essential to consider how project interventions may impact men and women differently. Therefore, gender is one of the cross-cutting issues which will be considered at the planning, implementation and evaluation stages of the project. This includes GHG emissions reduction while recognizing the different energy needs of people and addressing existing gender inequalities in carbon emission and energy production.

Within the project context, gender mainstreaming will aim to identify gaps in equality using sex-disaggregated data as well as monitoring the results. In addition, through project implementation gender-sensitive outputs and targets will be incorporated in the project result framework, including the share of women to be included in the training sessions, share of women reached by the raising awareness campaign and share of men/women influenced by project activities related to infrastructure improvements and effects on human development.

Final remark

The project will result in a reduction in greenhouse gas (GHG) emissions of 1.200 million tCO2e over the lifetime of the investments enabled. It will directly benefit more than 500,000 people in BIH (more than 15% of the total population), including 260,000 women and will lead to creation of at least 860 new full-time equivalent jobs.

A detailed Project Document would be developed within a two-month period. Project budget for its implementation in 2018 amounts approximately 800.000 €. Detailed annual project funding for the period 2018 – 2020 (app. 3m €) would be exactly defined and elaborated in Project Document.