

Component 1 – EE investments in health sector buildings

This component supports:

- EE investments in selected health sector buildings, for which achieved energy cost savings will be captured and reinvested using an energy savings capture model,
- Related technical services, including energy audits, designs, technical revision, works supervision, technical and social monitoring before and after the EE building renovations, and issuance of energy performance certificates for all retrofitted facilities, and
- Installation of energy consumption monitoring equipment in health sector buildings.


The investments will reduce energy consumption and associated CO₂ emissions, help lower recurrent energy expenditures, and improve comfort levels in the retrofitted health sector facilities.


a) Overview of the selection and implementation process of works on selected buildings

Buildings eligibility criteria and selection process: Eligible buildings includes special hospitals, general hospitals and health centers. The health buildings are selected during preparation of project appraisal document (PAD), and all selected health buildings meets the following basic eligibility criteria:

- public ownership;
- structural soundness of the buildings;
- absence of plans for closure, downsizing or privatization; and
- commitment to proper management, and operation and maintenance of new systems installed under the project.

List of buildings: Considering geographical service coverage, EE potential and regional distribution the list of 18 priority health buildings are identified (see map below).

Hospitals - 

Health centers - 



The buildings are grouped in 4 sets, based on payback period of investment. Buildings with higher savings are planned for reconstruction at the first period of MEEP 2 implementation (see table below):

Sets	Health buildings
I	Heath center Berane
	Heath center Plav
	Heath center Rozaje
	General Hospital Bar
	Heath center Ulcinj
II	Opšta bolnica Niksic
	Heath center Tivat
	Heath center Podgorica-Golubovci
	Special hospital Dobrota
	Special hospital Risan
III	Heath center Danilovgrad
	Heath center Zabljak
	Heath center Mojkovac
	Heath center Herceg Novi
	Heath center Bar
IV	Heath center Budva
	Heath center Podgorica - Blok 5
	Heath center Podgorica - Konik

Eligible Measures for retrofitting of selected health buildings: Eligible rehabilitation measures for financing, include upgrades to reduce the energy use of health buildings, including:

- Building envelop measures (insulation of walls, basements and attics, repair/replacement of external doors and windows, window optimization, i.e., partial replacement of existing windows with walls while complying with day-lighting requirements);
- Heating and cooling systems (boiler or burner upgrade/replacement, fuel switching, reflective surfacing of walls behind radiators, balancing valves, thermostatic valves and automatic temperature controls, pipe insulation, chiller/air conditioner replacement, heat pumps);
- Lighting (compact fluorescent lamps, fluorescent electronic ballast, light emitting diodes);
- Upgrading of electrical network if capacity is increased (transformers, capacitors); and
- Other financially viable energy efficiency measures (e.g., pumps and fans, solar water heating).

A limited amount of MEEP2 funds (up to 10 percent of the total investment costs) will be used for implementation of additional works, to ensure reasonably full renovation or longevity of investments (e.g. painting, replacement of old gutters and downspouts). Additional non-EE measures can be financed through health sector facilities and implemented as joint co-financing with MEEP2 resources.

The management of health building will be asked to nominate the specific non-EE measures, while MoH together with MEEP 2 Project Implementation Unit (MEEP 2 PIU) will review their request and make decision what non EE measures will be implemented on each building. The non EE measures will be presented in Detail energy audit.

Installation of EE equipment: The monitoring equipment will be installed in adopted health sector. As well, project will support collection of data for the preparation of energy efficiency inventory of state-owned and local government buildings. The data from inventory will be later used for the purpose of establishing the Central Information System for Energy Efficiency.

Implementation process: Implementation of MEEP 2 activities are unified and same for all buildings.

- **Preparation of Detail Energy Audit (DEA):** The works on the building begin with preparation of a DEA. The DEA will identify the economically most viable EE measures. Comfort improvements will also be identified and these may include visual, thermal, air quality and acoustic enhancements. DEA is a subject of approval of PSC and no-objection of WB.
- **Conclusion of Memorandum of Understanding (MoU) between MoH and health buildings:** The MoU will be prepared separately for each health building and signed between the MoH and project beneficiary (health building). The MoU will define project beneficiary obligations to: (a) maintain its respective EE investment, (b) participation in trainings and (c) share information on energy consumption. The signature of the MoU by the beneficiary is a condition for the implementation of the works.
- **Development of Technical Design Documentation (TDD):** Based from findings from DEA, the TDD will be prepared. TDD will be prepared as required by the relevant Montenegrin law, technical regulations, codes and standards.
- **Performance of Technical Design Revision (TDR):** In the case where the works are treated as reconstruction, the TDD will be subject of TDR.
- **Procurement activities:** The technical description and Bill of quantities from TDD will be a basis for preparation of the tender document for procurement of goods and execution of works. Procurement will be conducted according to the World Bank's Procurement Regulations for Investment Project Financing Borrowers', issued in July 2016, for the supply of goods, works, and non-consulting and consulting services, and the Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006 and revised in January 2011 as of July 1, 2016.
- **Implementation of works:** The contractor will procure the required material and equipment and executes works on the building. The implementation of the works, will be subject of daily supervision of the Work Supervision (WS) Consultant engaged by the MEEP 2.
- **Acceptance of works:** After WS Consultant confirm works are finished, the acceptance of works will be organized, between Contractor, beneficiary, WS, appointed project manager for the Contract from the MoH side and MEEP 2 PIU.
- **Issuance of energy performance certificates:** For retrofitted buildings under MEEP 2 energy performance certificate will be issued.
- **Proper maintenance of retrofitted buildings:** Trainings of the retrofitted buildings personnel will be organized on-site, in assembly, during the start-up, operation, maintenance, and/or repair of the supplied equipment. The trainings obligations will be included as obligation of

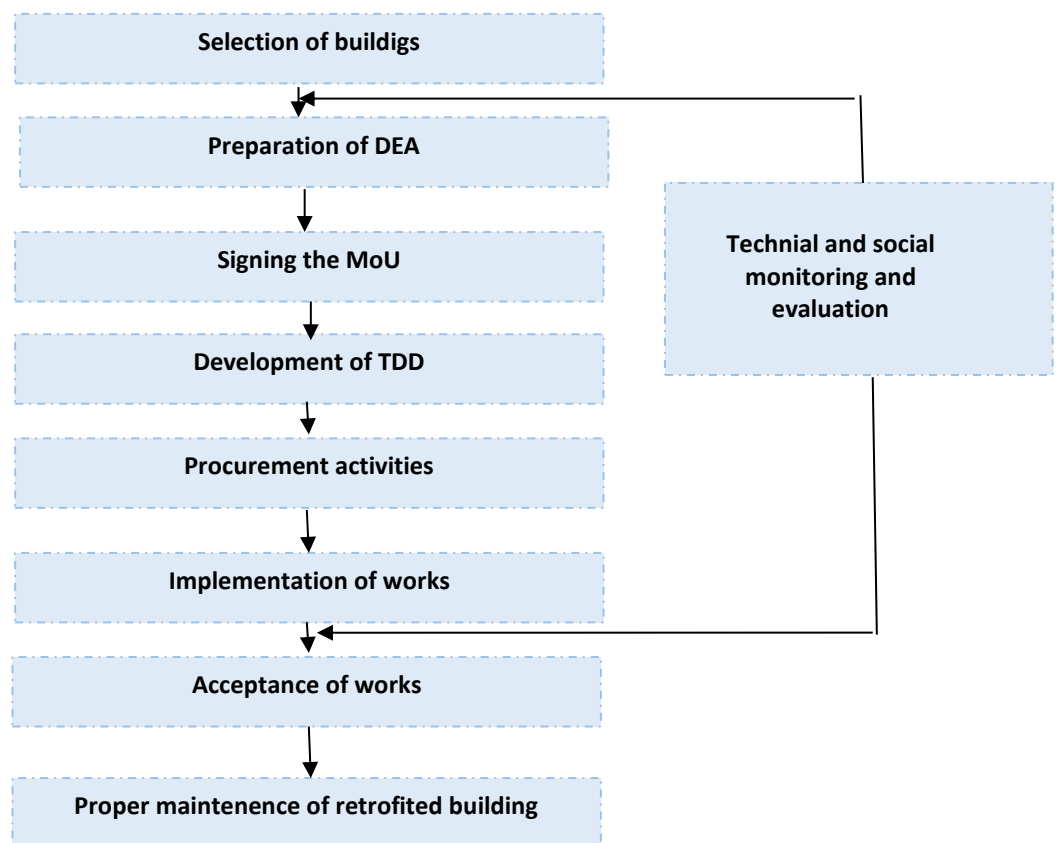
the contractor for works, while the obligation of the beneficiary staff to participate on trainings will be part of the MoU. The provided technical documentation will be Montenegrin language, as well. Equipment user manual in Montenegrin language, as well, will be provided by the contractor.

Technical and social monitoring and evaluation will be conducted before and after the investment, in order to present energy consumption and level of comfort before and after the investment. The results of measurement will be used to justify invested funds, to determine the level of energy savings to be used in energy capture model and for promotion and education of the public of the benefits of implementation of EE measures.

Technical monitoring (TM) services includes preparation of monitoring and valuation (M&V) methodology and protocol, collection of TM data and evaluation of results and preparation of TM&V report. The technical data will be collected during the heating season.

Social monitoring (SM) services includes preparation of social assessment methodology, collection of SM data and evaluation of results and preparation of SM report. The data will be collected during the heating season.

Steps of implementation process on objects is presented in diagram bellow:



Technical consultation services to support implementation of works on buildings: Providing technical services related to the EE Investments in Component 1, includes:

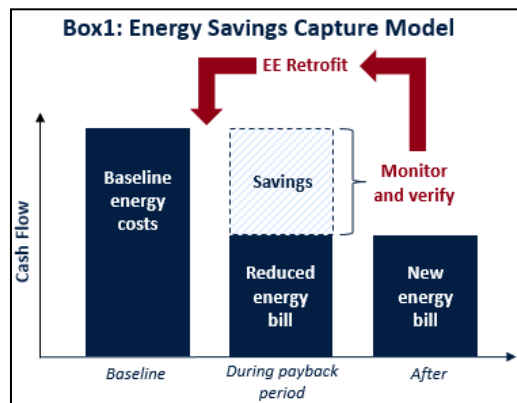
- the carrying out of DEAs,
- the preparation of TDD
- the carrying out of the TRD

- the carrying out of WS
- TM and SM BEFORE and AFTER the EE Investments and
- the issuance of energy performance certificates for retrofitted buildings.

b) Energy savings capture model

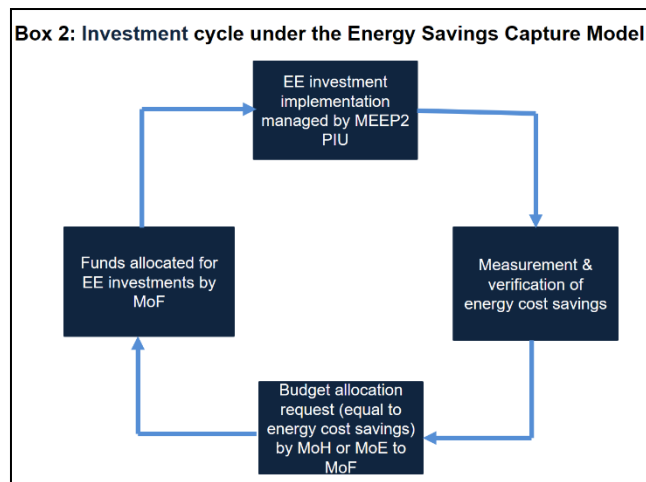
Besides demonstrating the benefits of EE improvements, implementation of works on buildings financed under Component 1 will also support the implementation of energy savings capture model.

An energy savings capture model is going to be implemented for all buildings to be retrofitted under the MEEP 2. The concept of the model is that the planned EE improvements will reduce energy consumption and related costs. The energy savings, generated through the EE investments, will be monitored, verified, and captured to support EE improvements in additional buildings.



By capturing and reinvesting verified energy cost savings, the model will demonstrate a sustainable financing mechanism that would allow to leverage limited MEEP 2 funds, and introduces a financing scheme that enables investments to be sustained beyond MEEP 2 and to be replicated to other sectors and programs in the future.

The energy cost savings capture model for the duration of MEEP 2 is designed to be in line with the current budgeting procedures.



The model will be implemented as follows:

- **Implementation of EE investments on selected buildings:** The PIU will prepare and implement EE investments in the selected health sector buildings. The first two sets will be funded through MEEP 2.
- **Performance of technical monitoring and verification (TM&V) of achieved energy cost savings:** To determine the achieved energy cost savings, monitoring equipment will be installed in health care facilities and a TM will be performed on all retrofitted building.

The TM&V will be performed based on Methodology for TM&E and Monitoring Protocol. The Methodology for TM&V should be in line with internationally accepted norms and standards for measuring of energy consumption parameters related to the building and its Heating, Ventilation, and Air Conditioning (HVAC) and lighting installations (temperature, humidity, fuel flow, heat consumption, illumination level, etc.), as well as, buildings indoor climate. The Monitoring Protocol will define what values shall be measured, what devices shall be used, where measuring devices shall be allocated and how long measuring shall take place.

The TM data will be collected during the heating season in duration of minimum two weeks, and evaluation of energy savings results will be presented in TM&V report for all buildings. The TM&V Report will justify energy savings (with normalization of heating degree days and other adjustment factors to be determined in the methodology), improved indoor climate and cost effectiveness of the recommended and implemented measures.

The annual cumulative results of achieved energy savings in all retrofitted and monitored buildings will be summarized in an annual consolidated TM&V report.

- **Annual budget allocation request:** In May, the Annual Work Plan will be prepared, outlining the planned investments for the following year, as well as the co-financing ratio based on the available funds (IBRD and captured energy cost savings).

The co-financing ratio for EE civil works will be determined on the funds available from IBRD loan proceeds and captured energy cost savings.

- **Allocation of the achieved energy cost savings:** The amount of the achieved energy cost savings will be allocated in the MoE budget as a capital expenditure.
- **Preparation and implementation of EE investments co-financed by captured energy cost savings and IBRD loan proceeds:** Co-financing will be used to finance the EE construction works, while technical services and operating costs will be covered by IBRD loan proceeds and Government in-kind contribution.

Procurement will be conducted according to the World Bank's Procurement Regulations for IPF Borrowers' (the Regulations), issued in July 2016, for the supply of goods, works, and non-consulting and consulting services, and the Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006 and revised in January 2011 and as of July 1, 2016 and Financial Agreement, for the sources from IBRD loan and allocated amount under MoE budget line capital expenditure (in amount of achieved energy cost savings).

