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Black Sea Basin Joint Operational Programme 2007-2013

BSBEEP

Black Sea Buildings Energy Efficiency Plan

GA1: Knowledge and information collection and dissemination -
Analysis of external current situation

Activity GA1.3

Executive Summary

**Collection of Appropriate Applied Best Practices Concerning
Energy Efficiency Issues and Proposals to Implement Them**



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GA1.3: Collection of Appropriate Applied Best Practices Concerning Energy Efficiency Issues and Proposals to Implement Them

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Black Sea Basin Joint Operational Programme 2007-2013
Black Sea Buildings Energy Efficiency Plan
(BSBEEP)

Black Sea Buildings Energy Efficiency Plan (BSBEEP) project aims at the establishment of strong regional partnerships and cooperation schemes in Black Sea area through the reinforcement of administrative capacities of local authorities and bodies in a very crucial sector (energy efficiency in buildings) having major environmental and economic impacts locally and globally.

The ultimate goal is to achieve change in the way they treating energy for buildings; facilitating change in the way local societies are acting. Furthermore, the project focuses on the establishment of a knowledge and experience exchange network aiming at the promotion of buildings energy efficiency. The network will engage a wide spectrum of organizations such as local and regional authorities, universities and research centres and NGOs which will help promoting energy efficiency in buildings at local and regional level. Meanwhile it will focus on raising awareness and mobilising private sector and leverage funds to support future initiatives.

Ten partners are participating in the BSBEEP Project from six different countries; Municipality of Kavala (GR), Municipality of Galati (RO), Municipality of Cahul (MD), Municipality of Mykolayiv (UA), Municipality of Samsun (TR), Municipality of Tekirdag (TR), Democritus University of Thrace (GR), University Dunarea de Jos of Galati (RO), American University of Armenia (AM) and Renewable Resources and Energy Efficiency Fund (AM).

More details about BSBEEP Project and the full GA1.1 study (available in English) are available on its website: www.bsbeep.com.

GA1.3: Collection of Appropriate Applied Best Practices Concerning Energy Efficiency Issues and Proposals to Implement Them

The GA1.3 study has collected best practices in energy efficiency solutions throughout the EU and the Black Sea countries, as well as identified areas where these best practices can have valuable applications to save energy in buildings. The study aims to deliver a guidebook to the decision-makers who are need to make a decision on what technical solution to choose for improving the efficiency of energy use in a given building. To help such decision-makers make an informed decision, the study lays out the technologies available in the market for improved building energy performance, what are their respective advantages and drawbacks, application niches, as well as offer practical guidance of application nuances based on real cases on selected buildings of the BSBEPP partner communities.

The report compiled a wealth of information on best practices including the following energy efficiency solutions for buildings and proposes potential applications in specific buildings of the project partner communities:

Bioclimatic Design

Building orientation, shading, day lighting, cool roofs, green roofs, natural ventilation, passive heat storage and temperature leveling, concrete-core activation, phase-change materials, etc., with proposed application of the above passive solutions for implementation in the Municipality of Yerevan, Armenia

Renewable Energy Systems Integration

Solar photovoltaic renewable energy systems; solar (thermal) renewable energy systems, heat pumps, geothermal heating. All technologies were described with consideration of their respective characteristics, technology categorization, equipment selection, installation, cost calculations, etc.), with potential application proposal for implementation in the Municipality of Samsun, Turkey.

Insulation

Measurement of insulation performance, analysis of building envelope and heat flows, humidity, air flows, energy efficiency issues, insulation of roofs, walls, floors, efficient windows, etc., with potential application proposal for Municipality of Cahul, Moldova.

Energy Efficient Lighting

Description of efficient lighting solutions, energy efficient lighting technologies for households and commercial buildings, features of energy efficiency in lighting in practice, with potential application proposal for implementation in Tekirdağ Metropolitan Municipality, Turkey.

Building Energy Management Systems

Consideration of top, middle and bottom level of the building energy management system in its structure and network, and practical applications. The potential application proposal for implementation is aimed at the Municipality of Kavala, Greece.

Frames Replacement

Basic types and materials, efficient design, and installation of frames, with potential application proposal for implementation in the Municipality of Mykolayiv, Ukraine.

Electro-Mechanical Systems

heating boilers, district heating systems, and individual heating system, forced, natural and hybrid ventilation systems, individual and central air conditioning systems; inverter, VRV/VRF and thermally activated air conditioning systems; HVAC technologies using renewable energy sources, such as Active Solar Water Heating, biomass heating systems, geothermal, aerothermal/ hydrothermal, air source and water source heat pumps, with potential application proposal for the implementation in Municipality of Galati, Romania.

The study takes a substantial effort to compile the best practices with detailed description of the individual state-of-the-art technologies, schemes, graphs and charts illustrating their performance in operation, advantages, benefits, areas of application, their potentials for achieving greater comfort, efficiency of energy use, energy and cost savings, benefits to the environment and the community.

For all the technologies, the sites selected for potential application were analyzed based on their starting conditions, relevance and applicability of given technologies, analysis of potential intervention nuances, cost and benefit considerations. The analysis of applicability to the selected buildings

in BSBEPP partner communities is based on an in-depth assessment of background conditions, including the technologies in place under status quo, inefficiencies of current capacities, operational regimes, quality of service, as well as acting technical norms as well as tariffs, which will predefine the technical compliance as well as cost-effectiveness and payback of investments in proposed energy efficiency retrofits.

While the technical and economic advantages, as well as environmental and social benefits of modern building energy efficiency best practices are obvious, the market uptake of these clearly advantageous technological solutions has been slow. The study further lays out a list of obstacles which, according to the authors' views, hamper the wider application of the modern best practices in building energy efficiency. Some of these obstacles include technical constraints related to the needs of a particular engineering solution. However, in cases where no technical constraints information barriers are present, several other barriers still arise. The energy efficiency retrofitting requires comprehensive technical knowledge, while the decision-makers may have lack of awareness on specific technologies, as well as uncertainty about expected cost savings. Some of these technologies also require significant capital investments, which impose another set of barriers such as potentially long-term payback periods, which can hamper the process of attracting financing and packaging these technical solutions into bankable investments. The study further offers some solutions to overcome these barriers and enhance the widespread application of modern best-practices in building energy efficiency.

The study not only offers a valuable resource for educating investment choices in countries of Black Sea region and beyond, but also illustrates the step-by-step process in analyzing the desired technologies' applicability to the target building. The barriers outlined in the study can be addressed through the legal-regulatory, capacity building and financing solutions laid out in the parallel studies of the present BSBEEP series.