

iSBEMba

FEDERATION OF BOSNIA AND HERZEGOVINA

EU Energy Performance of Buildings Directive (EPBD)

The Energy Community requires the national implementation of:

- Minimum Energy Performance Requirements
 - An acceptable methodology for calculating the integrated energy performance of buildings
 - Minimum energy performance standards for new buildings
 - Minimum energy performance requirements for existing buildings undergoing major renovation
- Energy Performance Certificates (EPCs)
 - Provided to prospective purchaser/tenant
 - Prominent display of the energy certificate in all public buildings and “institutions providing public services”
- Undertaken by qualified and/or accredited experts

DIRECTIVE 2010/31/EU of 19 May 2010 on the energy performance of buildings

Incorporated and adapted by Ministerial Council Decision 2010/02/MC-EnC of 24 September 2010 amending Decision 2009/05/MC-EnC of 18 December 2009 on the implementation of certain Directives on Energy Efficiency.

The adaptations made by Ministerial Council Decision 2010/02/MC-EnC are highlighted in **bold and blue**.

Whereas:

- (1) Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings has been amended. Since further substantive amendments are to be made, it should be recast in the interests of clarity.
- (2) An efficient, prudent, rational and sustainable utilisation of energy applies, *inter alia*, to oil products, natural gas and solid fuels, which are essential sources of energy, but also the leading sources of carbon dioxide emissions.
- (3) Buildings account for 40% of total energy consumption in the Union. The sector is expanding, which is bound to increase its energy consumption. Therefore, reduction of energy consumption and the use of energy from renewable sources in the buildings sector constitute important measures needed to reduce the Union's energy dependency and greenhouse gas emissions. Together with an increased use of energy from renewable sources, measures taken to reduce energy consumption in the Union would allow the Union to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), and to honour both its long term commitment to maintain the global temperature rise below 2 °C, and its commitment to reduce, by 2020, overall greenhouse gas emissions by at least 20% below 1990 levels, and by 30% in the event of an international agreement being reached. Reduced energy consumption and an increased use of energy from renewable sources also have an important part to play in promoting security of energy supply, technological developments and in creating opportunities for employment and regional development, in particular in rural areas.
- (4) Management of energy demand is an important tool enabling the Union to influence the global energy market and hence the security of energy supply in the medium and long term.
- (5) The European Council of March 2007 emphasized the need to increase energy efficiency in the Union so as to achieve the objective of reducing by 20% the Union's energy consumption by 2020 and called for a thorough and rapid implementation of the priorities established in the Commission Communication entitled "Action plan for energy efficiency: realising the potential". That action plan identified the significant potential for cost-effective energy savings in the buildings sector. The European Parliament, in its resolution of 31 January 2008, called for the strengthening of the provisions of Directive 2002/91/EC, and has called at various times, on the latest occasion in its resolution of 3 February 2009 on the Second Strategic Energy Review, for the 20% energy efficiency target in 2020 to be made binding. Moreover, Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020, sets national binding targets for CO₂ reduction for which energy efficiency in the building sector will be crucial.

REEP and REEP Plus support

- REEP
 - Draft regulation defining NCM
 - Software specification to implement NCM
 - Initial tailored version of SBEM
 - ‘Train the trainer’ including ‘super user’ training
 - Registry specification and demo site
- REEP Plus
 - Further tailored databases
 - Interface and calculation engine
 - In-depth technical translation
 - Training

BA Federation's statutory requirements

- Regulation of energy audit and energy certification (Official gazette of Federation of B&H No. 87/18)
 - ✓ Approved an official methodology to calculate the energy performance of all types of buildings (dwellings, commercial, public, and industrial)
 - ✓ Minimum standards of energy performance for new buildings. Minimum 'B' rating
 - ✓ Energy Performance Certificates (EPCs) required for new and existing buildings
 - ✓ Approved software – iSBEMba (for independent control of energy certificates at first and licenced person)
- EPBD article 10 – who can generate EPCs?
- Regulation of licencing persons for energy audit and energy certification (Official gazette of Federation of B&H No. 87/18)
 - '...in an independent manner...'
 - '...by qualified and/or accredited experts..'



Federation of B&H's implementation of iSBEM

- Federal Ministry of Physical Planning applied for technical assistance – „developing calculation tool“ for energy performance of buildings through REEP;
- After definition scope of project we started implementation with great help of local Consultant from ECA company;
- It was need to prepare relevant data for iSBEM – specific for FB&H, in form that BRE asked and translated on English;
- BRE acomodated iSBEM to FB&H methodology, asset rating and reference values;
- All those needed permanently work and communication with BRE and local ECA consultants



Simplified Building Energy Model for Federation of Bosnia and Herzegovina

- BRE has modified and developed the UK's SBEM software to create a Federation of B&H -specific version:
 - **SBEMba** calculation engine
 - **iSBEMba** interface
- Now the approved software to calculate the energy performance of residential and non-residential buildings in Federation of B&H
- Generates Energy Performance Ratings (and accompanying Recommendations) for official certificates for new and existing buildings

How is SBEMba tailored?

- Screens and outputs translated into Bosnian
- Incorporates:
- [Activities Database](#) depends of building purpose based regulations of FB&H
- [Weather database](#) for nine meteorological stations and specific reference values for Climatic region North and South
- [Construction and glazing databases](#) (FB&H)
- [HVAC system](#) efficiencies
- Implement calculation for FB&H regulation EPC rating scale and MEPR targets

Construction database (FB&H)

thanks to GIZ and UNDP in FB&H have been developed Typology for Residential and Typology for non-residential buildings which integrate typical contractions

The screenshot shows a web application interface for a construction database. At the top, there are navigation tabs: "Općenito", "Baza projekta", "Geometrija", "Usluge u zgradi", "Rangiranje", "Navigacija zgrade", and "O iPEMZ". Below these, there are sub-tabs for "Tip zida", "Tip krova", "Tip poda", "Tip vrata", and "Ostakljeni otvori". The main content area is titled "Građevinska konstrukcija Zida" and includes a search icon, a refresh icon, and a help icon. There are two sub-tabs: "Općenito" and "Dodijeljeno". The "Općenito" tab is active, showing a form with the following fields:

- Naziv:** "Zida" (highlighted in green)
- Odaberi ukoliko uključuje metalnu podkonstrukciju:**
- Inače korišteno za zidove koji povezuju zonu sa:** "Vanjski" (dropdown menu)
- Šta želite da učinite:** Radio buttons for "Preuzimanje iz biblioteke" (selected) and "Unos vlastitih vrijednosti".
- U - vrijednost:** Input field with "0.91" and unit "W/m2K".
- k_m:** Input field with "86.46" and unit "kJ/m2K".
- Tipovi gradnje iz kataloga:** A dropdown menu showing "Vanjski zid, opekarski blok".
- Biblioteka:** A list of construction details, with the first item "malter 2,0cm, šuplji opekarski blok 25cm, malter 2,0cm" highlighted in black.

At the bottom of the interface, there is a record navigation bar showing "Record: 1 of 2", a "No Filter" button, and a search input field.

Asset rating of buildings

SBEM creates **NOTIONAL BUILDING**- virtual referent building of actual building,









engine of SBEM compares that notional building and actual building in order to do the asset rating, the result is relevant energy class

This approach was not applicable for FB&H

Consultant accommodated SBEM to FB&H possibilities and do the asset rating based on tabular referent values (depends on purpose of building, shape of building and climatic region)









Rating scales

Residential buildings

Energijski razred	Relativna vrijednost specifične godišnje potrebne toplinske energije za grijanje $Q''_{H,nd,rel}$ (%)
 A+	≤ 25
 A	≤ 50
 B	≤ 100
 C	≤ 200
 D	≤ 300
 E	≤ 375
 F	≤ 450
 G	>450

Energijski razredi nestambenih zgrada su dati u sljedećoj tablici:

Non- residential buildings

Energijski razred	Relativna vrijednost specifične godišnje potrebne toplinske energije za grijanje $Q''_{H,nd,rel}$ (%)
 A+	≤ 30
 A	≤ 50
 B	≤ 100
 C	≤ 200
 D	≤ 300
 E	≤ 375
 F	≤ 450
 G	>450

SBEM includes rating scales

Općenito Baza projekta Geometrija Usluge u zgradi **Rangiranje** Navigacija zgrade O iPEMZ

Rangiranje nekretnine

EPC Bosnia_Herzegovina

Rangiranje zgrade Grafičko rangiranje Preporuke Energetski pregled Dnevnik proračuna Proračun greški

	Grijanje	Hlađenje	Energija pom	Rasvjeta	Topla sanitarna voda	Ukupno	
Stvarni	10.21	12.64	20.67	22.99	17.15	83.67	kWh/m2/god

	QHnd,ref	QHnd,stvarno	EC rangiranje	Ukupna zapremina grijanog dijela zgrade Ve
kWh/m2/god	45.66	34.56	76	8700
Energetski razr	B-C	B		Faktor oblika zgrade f0 (m-1)


Proračun EC rangiranje

Prosječna U - vrijednost [W/m2/K] 1.46

Godišnja emisija CO2 (t/god) zgrade 51.74

Specifična godišnja primarna energija zgrade E'prim (kWh/m2god) 213.43

Napredak obračuna: rangiranje objekta je završeno

 Kliknite da provjerite dodijeljene vrijednosti objekta, NEMA KRITIČNIH nedodijeljenih vrijednosti u projektu

Release versions of iSBEMba

During REEP Plus

- March 2019
 - Incorporating draft new databases
- July 2019
 - Incorporating all databases and modified calculations
- September 2019
 - Preparation for technical translation
- November 2019
 - Including technical translation updates

Training

- To meet the requirement for qualified and accredited experts
- One session in 2016 including 'super user' training
- A second in October 2019 including technical translation updates
- A third scheduled for next week