PLANNING FOR EE IN BUILDINGS IN BOSNIA AND HERZEGOVINA

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Methodology for calculation of energy need in residential building → Minimum requirements for buildings → Energy certification

Revision of Main Design → Construction Permit → Supervision → Technical Acceptance → Use Permit

Urban Planning Permit → Construction Permit → Building Typology → Renovation Strategy

Cost optimum analysis
Methodology for calculation of energy need in residential building

\[ Q_H = Q_{H,\text{net}} + Q_w + Q_{H,\text{ls}} + Q_{W,\text{ls}} \quad \text{[kWh/a]} \]

\[ E_{\text{del}} = Q_H + \frac{Q_e}{\text{COP}} + Q_{V_h} + Q_{\text{aux}} + E_L - E_{\text{obj}} - E_{\text{pov}} \quad \text{[kWh/a]}, \]

\[ E_{\text{prim}} = \sum_i E_{\text{del},i} \cdot f_{\text{prim,del},i} - \sum_i E_{\text{ex},i} \cdot f_{\text{prim,ex},i} \quad \text{[kWh/a]}, \]

- BAS Standards adopted
- Missing national annexes
Residential building that is heated during the heating season at temperature of 18 °C or above, must be projected and built the way that yearly energy need per conditioned area, $Q''_{H,nd}$ [kWh/(m²·a)], depending on the shape value, fo (V/A):

\[
\begin{align*}
    f_0 & \leq 0,20 & Q''_{H,nd} & = 51,31 \text{ kWh/(m}^2\text{·a)}, \\
    0,20 < f_0 < 1,05 & & Q''_{H,nd} & = (41,03 + 51,41 \cdot f_0) \text{ kWh/(m}^2\text{·a)}, \\
    f_0 & \geq 1,05 & Q''_{H,nd} & = 95,01 \text{ kW·h/(m}^2\text{·a}).
\end{align*}
\]
includes calculation of energy needs of the building and required annual specific energy for heating energy for reference climatic data and determining energy class building - data from the main project in relation to rational use of energy and thermal protection.

includes energy audit of the building, calculation of energy needs of the building and required annual specific energy for heating energy for reference climatic data and determining energy class building.
Cost optimum analysis
Building permitting regime

**Revision of Main Design**
- Main Design
- Urban Planning Permitt

**Construction Permit**
- Construction
- Supervision
- Technical Acceptance

**Energy Certificate**
- Use Permit

**EE Guideline for Investors**
- Calculation tool
- Template for EE elaborate
- EE guidebook for building Designers and engineers

EE guidebook construction companies and supervision
Building typology

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Renovation strategy

Figure 8 – Required increase in renovation depth to achieve 90% CO₂ saving (Source – IPE model)

Figure 6 – Main types of barrier encountered in building renovation (Adapted from IPE *)
THANK YOU!

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