

TIMEPAC Academy

How to make an EPC a dynamic tool for verification of energy savings

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12 March 2024



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Key questions that will be addressed:

- What are differences between real energy consumption and calculated EPC energy consumption?
- What are the methods to calibrate EPC model with real consumption data?
- How to calculate energy savings from a calibrated EPC model?

Key messages

Energy efficiency measures are calculated according to the actual consumption of targeted energy consumers!

Make sure that calculated energy (heating, cooling, air conditioning, lighting, and other specific energy consumption) in EPC is corresponding measured (modeled) energy consumption according to real consumption validated with bills!

Make sure that the analysis of real consumption is validated with bills!

EPC Croatia

ENERGETSKI RAZRED ZGRADE	Specifična godišnja potrebna toplinska energija za grijanje $Q_{H,nd}^{*}$ [kWh/(m ² a)]	Specifična godišnja primarna energija E_{prim} [kWh/(m ² a)]
	C	B
Specifična godišnja isporučena energija E_{del} [kWh/(m ² a)]		
Specifična godišnja emisija CO ₂ [kg/(m ² a)]		
Upisati „nZEB“ ako energetska svojstva zgrade (E_{prim}) zadovoljava zahtjeve za zgrade gotovo nulte energije propisane važećim TPRUETZZ		nZEB

E_{del} (kWh/(m²a)) – Specific annual Final energy consumption in the building. This value should correspond to real, specific annual energy consumption–related to the bills!!!

$$E_{del} = E_{H,del} + E_{W,del} + E_{C,del} + E_L$$

What are the differences between actual energy consumption and calculated EPC energy consumption?

Delivered energy Ed_{del} is the annual required amount of energy that is supplied to the technical system of the building for heating, domestic hot water preparation, cooling, ventilation and lighting needs calculated for reference climatic data and prescribed standard conditions for the use of the building space.

It is calculated so that the necessary energy for heating, cooling, and preparation of DHW ($Q_{H,nd}$, $Q_{C,nd}$, Q_W) is multiplied by the corresponding consumption factor of the supplied energy.

What are the differences between actual energy consumption and calculated EPC energy consumption?

Heating and cooling energy

$Q_{H,nd}$ and $Q_{C,nd}$

- Insufficient (incorrect) envelope data.
- Ventilation losses
- Internal heat gains!
- Difference between projected and real temperature in the building for heating (20°C vs 21-25°C).
- Difference between projected and real temperature in the building for cooling (26°C vs 20-22°C) .
- Heating schedule (8 -16 hours per day, working days)

What are the differences between actual energy consumption and calculated EPC energy consumption?

Heating and cooling energy

The corresponding consumption factor for heating and cooling

- Insufficient (incorrect) technical data on the installed heating equipment.
- Insufficient (incorrect) technical data on the installed cooling equipment.

Source (boiler, heat pump...), transport (pipes, ventilation duct), transmission (radiator, fan coil)!

What are differences between real energy consumption and calculated EPC energy consumption?

Primary energy

- Insufficient (incorrect) data of real energy consumption.
- Wrong coefficient for primary energy

Make sure that you have considered all energy consumers in the building:

- Electric energy consumers
- Natural gas consumers
- LPG consumers
- Other consumers

What are methods to calibrate EPC model with real consumption data?

Modelling energy consumption

Modeling energy consumption with real data gathered from interviews and on-site measurements:

- Heating temperature
- Cooling temperature
- Ventilation
- Illumination
-

Iterative process in which on-site collected data and experience have crucial role.

How to calculate energy savings from calibrated EPC model?

Energy savings related to energy efficiency measures are calculated as a difference between actual consumption before the measure's implementation (ex-ante) and projected consumption (ex-post) after the measure's implementation.

The projected consumption takes into account the same operating schedule as existing equipment (system) that is subject to the measure and technical data (efficiency) of new equipment (system) that is planned for installation.

kWh



**If you would like more information,
please visit www.timepac.eu or contact us at
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Thanks for your attention!