



## **Czech Republic - Technical Framework**

*When considering an energy efficiency retrofit within your national housing market, a wide plethora of consideration needs to be made. Below, we list key findings to facilitate your analysis of the retrofit investment. More details and backgrounds can be found on the website [www.rentalcal.eu](http://www.rentalcal.eu).*

### **Residential buildings and building types in Czech Republic:**

- Czech Republic's total housing stock comprises 4.756.572 dwellings, out of which 920,405 (22,4% of the permanently occupied dwellings) represent the dwellings occupied by tenants.
- Relevant building types for the rental housing sector are mainly all types of multi-family houses
- More than 60 % of Czech dwellings are situated in masonry buildings. About 30% of dwellings are situated in large panel buildings.
- About 83 % of dwellings are heated with central heating, 7,3 % of dwellings are supplied with apartment heating systems, only 8,9% are heated locally with a stove.
- The used energyware for heating: RES 36% , gas 26,9 % , solid fuels 19,2%, heat (DH) 13,4%, electricity 3,8%, liquid fuels 0,7%
- Energy consumption rates vary over construction periods. The highest annual consumption can be observed in residential buildings constructed before the World War II and shortly after the war. The average annual heating consumption is 169 kWh/m<sup>2</sup> of heated area. The average heated area of all dwelling types is 75,2 m<sup>2</sup>
- The heating energy consumption represents 71% of total final energy consumption in the households.
- Average age of residential buildings is 52,5 years, the average age of family houses is 49 years

### **Energy saving measures and investment costs in Czech Republic:**

- One of the most common procedures is the overall energy efficiency improvement of the building envelope. This improvement consists in adding external wall insulation, adding roof insulation especially when re-roofing and replacing old windows with new more efficient types.
- The most common system measure is the replacement of coal boiler or conventional gas boiler with a gas condensing boiler.
- After the energy retrofit of the building the heating source must be regulated to respond adequately to the lower heat demand / (reduced heat losses). In apartment blocks with central heating systems the temperature regulating valves (TRV) must be mounted on the heating radiators
- The increasing share of systems using RES is significant in case of individual houses
- Future trends building measures: Increasing thickness of external wall insulation, increasing share of triple glazing
- Future trends in system measures: Increasing share of heat pumps, solar systems and combined heat and power plants, ventilation systems with heat recovery.
- Average investment costs are available for a large number of typical building and system measures. These investment cost values are based on expert estimations double-checked with real costs examples (if available) .
- Data defining the share of pure maintenance and repair ('anyway costs') of energy saving measures are applicable.

### **Energy performance calculation methods in Czech Republic:**

- The Decree 78/2013 Coll. defines the energy performance indicators, specifies how to calculate them with reference to Czech and adopted EU standards. Two energy balance calculations are done in parallel for the evaluated building and for so called reference building which enables the benchmarking of calculation results.
- U values, cold bridges, indoor and outdoor environments (ČSN 730540 – part 1,2,3,4)
- Energy demand (CSN EN ISO 13 790)
- Calculation is done either for the whole building or for specific zones, i.e. calculation of heat losses, and heat gains, calculation of energy amount necessary to maintain specified indoor parameters.
- Delivered energy (CSN EN 15 316-X for the energy required by the energy systems also auxiliary energies, CSN EN 15 241, 15 242, 15 243, 15 665 for ventilation systems, CSN EN15 193 for lighting systems)
- Due to large quantity and complexity of standards a technical guidance documents TNI 730330 and 730331 providing input values and boundary conditions for the calculations are currently used.