

IMAGINE A BUILT ENVIRONMENT THAT
ENABLES A HIGH QUALITY OF LIFE FOR ALL



RECOMMENDATIONS FOR PUBLIC POLICIES
„Wider reasons for building renovation and
its impact on climate, energy and
macroeconomics of the state.“

PROJECT BUILD UPON
4th Slovak National Workshop
Bratislava, 29 September 2016
Hotel Avance Bratislava



Funded by the Horizon 2020
Programme of the European
Union

EUROPE REGIONAL
NETWORK



Wider reasons for building renovation and its impact on climate, energy and macroeconomics of the state

The recommendations emerged from the discussions among stakeholders at the workshop Build Upon, held on 29/09/2016 in Bratislava.

The main topic of the workshop: Wider reasons for building renovation and its impact on climate, energy and macroeconomics of the state.

Aim of the workshop: Buildings represent a large potential for energy savings, which is related to the reduction of CO₂ gas emissions and climate protection. During the workshop, we focused on the restoration of this subject in the national context – what impact the deep renovation of buildings would have on climate, energy and macroeconomics of Slovakia. These topics are also crucial for the government, in terms of redistribution of funds. Therefore, it is important to show that investment in the renovation of buildings can have a positive impact on the development of the country.

Summary of the topic no. 1: The impact of climate change on housing and use of buildings in Slovakia

The study had identified the following predicted climate change in Slovakia:

- The average annual temperature is expected to rise by 2-4 ° C by 2100 (from 0.25 to 0.5°C by 2020) compared to the period of 1950-1981.
- Faster growth of the daily minimum and maximum temperatures.
- Growth of the span and extremity of heat waves (by 3 days by 2050).
- Growth of the extremity of rainfall, presence of severe storms and strong (/heavy) wind.
- Lengthening of dry periods without rainfalls.
- Growth of the rainfall deficit up to 50% by the year 2100.
- Shortening the season of snow cover but growth of the depth of snow.
- Increase in sultry days.

Workshop participants then discussed the impacts of the climatic change on the housing and the use of buildings and the potential construction-technical measures to maintain the comfort and safety of its users.

Expected impacts on the operation of buildings:

- Reducing energy consumption for heating, increased demand for cooling;
- Interiors overheating, impossibility of cooling by windows ventilation due to strong winds;
- Decrease in the efficiency of heat distribution due to low consumption;
- Problems with the water supply due to droughts;
- Increased need for greenery irrigation around the buildings;
- Energy supplies interruptions (particularly of electricity) due to a line disturbance due to the extreme weather events;

The discussion identified the following necessary construction-technical measures:

- Quality thermal protection of the building shell for the prevention of overheating of indoor environment and energy savings, including maintaining the stability of thermal comfort in the case of a power failure.
- Installation of forced ventilation with heat recovery and external shielding as the prevention of interior overheating, while ensuring air exchange / ventilation and further energy need reduction for heating and cooling.
- Suitable colour scheme of facades and roofs - bright colours, respectively gravel or green facade / roof.
- The use of air conditioners at a minimum rate and solve their position on / in a building in relation to heat removal and condensation.
- Parallel water pipes installation and reservoirs of rainwater / grey water with the necessary infrastructure (filters) together with the use of water-saving appliances (flushing, shower hoses, etc.), i.e. intelligent (/smart) water management to reduce the consumption of drinking water and to ensure water supply during the dry seasons.
- Measures around the building for rainwater retention and mitigation of the heat island effect - the planting of greenery, green roofs and facades, polders, parking areas ensured with irrigation system – reservoirs of rainwater and aftercare (self-management).
- OZE installation in order to ensure power supply during outages, as well as a compensation for the increase in electricity consumption for cooling.

In terms of public policies, the following recommendations were formulated:

- Adjustment of buildings renovation support programs focus on the above-mentioned construction-technical measures, not the usual renovation of buildings.
- Although climate change is happening in stages, in the operation of buildings it will become evident in the horizon of two or more decades; due to the renovation cycle (30-40 years) it is necessary to encourage the building owners to implement or to prepare to implement the above-mentioned construction-technical measures already today. A number of measures additionally requires the implementation already during the current cycle of renovation; because later then it will be impossible to complete it without significantly affecting the renewed building (e.g. installation of parallel distribution, green roofs construction, installation of forced ventilation and external shielding, regulation of colour scheme of surface finishing etc.).
- Measures around buildings require the same attention as the buildings renovation itself. For this purpose, it is necessary to initiate a discussion on a possible state aid, respectively a regulation in the form of requirements, taking into account not only the investment costs but also the cost of maintenance of green areas, reservoirs and alike.
- Decrease in energy consumption for heating further reduces the efficiency of heat supply of CZT (district heating) systems (distribution lines). With the current method of calculating the regulated price of heat, it will mean the increasing share of fixed costs of district heating CZT on the price for end users. The consequence will be even smaller drop in heating costs after the building renovation and thus decreasing the motivation, but the economic feasibility of the renovation. It is therefore necessary to consider the possibility of increasing the efficiency of heat supply and changing the approach of controller towards the price calculation.
- In general, the decreasing demand for heat due to the increasing of the average outside temperature will lead to the reduction of heating costs. In time of the renovation, the cooling costs probably due to the absence of a natural cooling, will be unknown for the building owners and they will not tolerate them. Thus, the costs savings after the renovation of building will generally decline (in absolute values), while the costs of renovation, and therefore the loan repayments, will more likely continue to grow. The support tools using the public funds will be necessary to adapt to this change. Results of the study on the macroeconomic impacts of investments on the renovation of buildings indicate the extent to which it is effective to support the renovation of buildings from the point of view of the generated government revenues.

Summary of the topic 2: The macroeconomic impacts of investments in deep renovation of buildings in Slovakia

The study shows the impact of a model investment for buildings renovation to the Slovak National Economy. The major part of the calculations in this study was realized for the selected reference year 2014 and the value of a model investment for buildings renovation was by the authors set at the amount of € 100 million Euros. In this study, authors do not focus on a specific type of building, even on the extent of buildings renovation. This study shows rather a primary and direct view of the impact of this amount of money destined to buildings renovation on the Slovak National Economy.

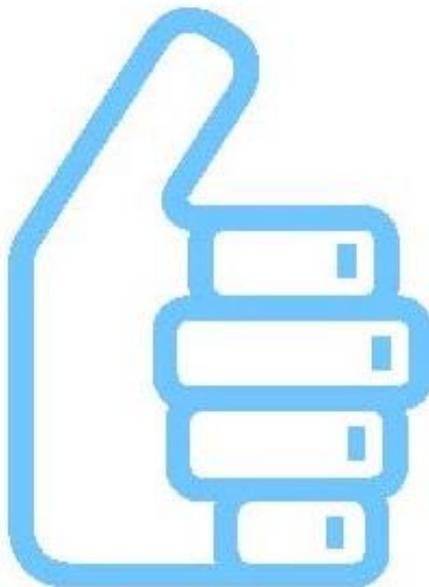
The modelling of the impact of investment directed to buildings renovation in GDP is based on two different economic theories. Through both theories, the study focused on the effects induced by this investment to national economy of the Slovak Republic. The first is the theory of Keynes's investment multiplier, which deals with the impact of investments to the economy of the state. Precisely the flow of investment in the form of household savings, which will be directed to buildings renovation (mainly residential) will trigger other positive effects on the National Economy - in GDP, on employment and increase in production of construction companies. The investment multiplier according to calculations by the authors has a value of 1.3. This is a coefficient of which effect will be transferred to the volume of inward investment into the construction sector through the renewal of buildings in the amount of 100 million Euros, then this effect in the form of growth in GDP will be 130 million Euros. The second economic theory is the theory of the multiplier of production. This theory highlights how the increase of production in one sector of the economy will affect the increase of production in other sectors of the national economy. This effect reflects exactly the multiplier of production, whose value when investing one more unit of output in buildings renovation is 1.2 to 1.4 units of growth in GDP. This means when investing 100 million Euros for renovation, the effect on GDP will be 120-140 million Euros.

Another important impact on the economy of the state is the creation of jobs through investment flows into the renovation of buildings. Of the total volume of finance directed into the renovation will be created more than 3,500 jobs. This study carried out the comparison of the cost of employment creation from the renovation of buildings and the cost of the jobs that have been created through state aid - investment incentives provided to domestic and especially to foreign investors. The cost of employment creation from buildings renovation (€28,000) are more effective compared to resources spent on investment incentives for foreign and domestic investors (€61,000).

Other important benefits to the state budget from the investments to buildings renovation are: income to the state budget from the VAT (4 million Euros), income to the state budget from the payroll taxes and payroll contributions to health and social insurance (14.8 million Euros) and savings on unemployment benefits (12.5 million Euros).

www.sk gbc.org
www.buidupon.eu

BUILD UPON



A PROJECT BY



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649727.