



# **Incentives of the Slovakian Government for Energy Efficiency Improvements of the Housing Stock**

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# Introduction

- Given the current energy prices increases, a significant attention is paid to reduction of consumption and increase of energy efficiency in the residential buildings. This issue is acute first of all for financial considerations.
- Improvement of buildings' thermal insulation with the help of insulation materials is carried out in compliance with main construction standards, taking into account the protection of health, hygiene, and reduction of energy expenses.
- Arguments for weatherization have economical prerequisites, too. In case of additional weatherization of buildings, these arguments give evidence of the possibility to solve several issues at once: improve the physical state of buildings, eliminate the drawbacks of their bad maintenance, drive the technical parameters of buildings' structures closer to modern requirements.

# Main Economic Arguments for Building's Owner

- reduction of financial costs for heating by 30-40%;
- financial benefit due to a reduced heating season;
- reduction of costs for air-conditioning in summer time;
- for new buildings – more profitable investments into the heating devices and the thermal network.



# Main Technical Arguments for Thermal Insulation of Buildings

- reduction of energy consumption for heating;
- elimination of hygienic drawbacks;
- creation of comfortable conditions in apartments;
- increase of thermal stability of building structures;
- elimination of heat leakage spots;
- delay of corrosion at the joint of panels;
- increase of building's service life.

# **Main Possibilities for Reconstruction (thermal rehabilitation of buildings)**

- Means from the Repair and Maintenance Fund.
- Government subsidies.
- Loan from State Housing Development Fund.
- Mortgage lending.
- Funds of construction companies.
- Credits from commercial banks.

# Means from Repair and Maintenance Fund

- Currently, the bigger part of residential fund is privatized. The Law on sale of housing and dwelling houses stipulates that owners of housing (communities, housing cooperatives) are obliged to sell this housing to tenants at the price, established by law. At the same time the law stipulates the obligation of new private owners to create buildings' repair and maintenance fund. This fund is formed by owners at the account of coordinated fees, which are calculated on the basis of 1m<sup>2</sup> of apartment's floor space. The fund finances repair and maintenance of buildings. Also, it is possible to finance reduction of energy expenses from this fund. The fund can be created either by a one-time contribution of owners, or by some other way.

# Government Subsidies

- Slovakia's legislation allows allocation of various subsidies. One of the subsidies is the donation for elimination of houses' system damages. In compliance with this definition, it is possible to allocate subsidies for the following types of damages:
- claydite-concrete layers of the lift slabs in multi-apartment buildings;
- «troskonemzobeton» fitted floors on the lift slabs in multi-apartment buildings;
- staircase and ladder space;
- loggias (structural system ZT/TO&B);
- other building structures and elements, which contain layers, made of thermal insulation materials.
- In the majority of the above-listed examples thermal insulation is used. The following are eligible for subsidies: communities, associations of co-owners of apartments, housing cooperative. Subsidies can be allocated to the amount of up to 50% of expense for construction of a house, but not more than on the basis of 14 USD/m<sup>2</sup>. Such donation per one building can be allocated only once during the building's life time. Such method is only a method of joint financing, and the applicant should submit his own means for joint financing of the requested object.

# Loans from State Housing Development Fund

- Nowadays, the most frequently used and affordable way of thermal rehabilitation financing is the revolving credit with a low interest rate (from 1 to 20% at the lending rate of the National Bank) to the amount of 80% of the estimated cost of reconstruction, but not exceeding on the basis of 250 USD/m<sup>2</sup> of the housing area. At that, the credit reimbursement term is 20 years.
- The following are technical conditions for improvement of thermal and technical characteristics of the reconstructed housing:
  - improvement of heat-insulation characteristics of open building structures;
  - alteration of need in thermal energy for heating minimally to the amount of 20% of the level of reconstruction;
  - possibility to hydraulically regulate the heating system with taking into account the increase of heat-insulation characteristics of the building structures;
  - equipment with heat metering and regulating devices;
  - achievement of at least close life cycles of main and heat-insulation building structures.
- The law also envisages a variety of other technical conditions, which improve the quality of houses. For example, elimination of cracks in the concrete and brick structures, in the joints between the building structures, elimination of roughness in constructions. Credit allocation is conditioned by availability of 20% of own means, the possibility to reimburse the credit, consent of housing owners to bear the credit expenses.

# Mortgage Lending

- Mortgage lending is the most frequently used form. The question is about the classical way of financing the construction, common in Europe, when the State supports those commercial banks, which, frequently finance construction..

# Funds of Construction Companies

- The next form is attraction of means of construction companies. Builder can be a legal person or individual. Such person receives a state prize to the amount of \$62.5 for each \$625 of executed works. One of the advantages of building activity is the possibility to get a beneficial credit for execution of construction or reconstruction. Yet, this form of activity is rarely used for the thermal insulation works.



# Commercial Banks' Credits

- Commercial banks nowadays offer credits on relatively advantageous terms, and the access to credits is open.

- The above description goes on to the idea that a bigger part of financing of thermal rehabilitation and increase of efficiency of use of thermal energy in multi-apartment buildings is a burden to be carried by owners, who can use a combination of various possibilities of financing. It is necessary to clearly realize, that the final payer of the received heat is he who consumes it. Based on real considerations that the payback period of investments is about 5-10 years, there are prerequisites that the credits will be paid off at the account of decrease of payment for heat as a result of saving of this heat.

# The Example of *Michalovce*

- Currently, in *Michalovce*, generation of heat and hot water for apartments and residential buildings with regulated thermal networks is carried out at the established price of 18 USD/GJ. Annual gain made up about 2 USD/GJ. It is possible to increase the efficiency of use of thermal energy at the place of generation thereof, during transportation, as well as in multi-apartment buildings. Below, we will briefly examine some achievements in the increase of efficiency of heat use in *Michalovce*.

# The Example of *Michalovce*

- Town of *Michalovce* owns 17 heat generation units, which supply heat and hot water to houses, schools, pre-school institutions, and administrative buildings. Since 1993, these units and heat generation facilities have been leased on the basis of a contract by a private enterprise, which ensures generation, transportation, and sale of energy to consumers. The enterprise is licensed to generate and transport heat. The license is regulated by the Law on thermal energy, and is controlled by the Regulation Board of Slovakian Republic and by the controlling decisions of the Ministry of Economy and the Ministry of Finance of the Slovakian Republic.

# The Example of *Michalovce III*

- The enterprise uses the income, incurred from sale of thermal energy, to finance, besides other activities, modernization and rationalization of the thermal economy. At that, the City council becomes owner of the investment improvements. Modernization is determined on the basis of reduction of costs for generation of heat, for use of natural gas. The enterprise carries out its intentions only after the annual plan is approved by the City council deputies. This ensures the deputies' awareness in this field.
- Starting from 1993, about 100 million Slovak korunas have been put into modernization and rationalization of the thermal economy, and namely:
  - 1. At the first stage, heat meters were installed at the entry to each object, as to meter the heat supply.
  - 2. Simultaneously, thermal expansion valves were installed in the apartments on radiators, which automatically regulate the heat to the desired level. Also, hot water meters were installed in the apartments. All these allowed the residents to independently regulate the use of heat and hot water, taking into account objective expenses.
  - 3. From 1994, an expanded complex reconstruction of the thermal economy started to get implemented. Gradually, the following have been carried out:
    - reconstruction of boiler-houses, using the most advanced technologies with a high heat generation capacity and low energy costs;
    - installation of equipment for automatic and secure works in compliance with Johnson Controls (SRN);
    - construction of central dispatch center with data information networks from each boiler-house. This allowed to separately control and optimize heat generation from one center.

# The Example of *Michalovce IV*

- Execution of these measures increased the efficiency of the entire process of generation and transportation of heat and hot water due to:
- 1. Reduction of natural gas consumption for generation of heat and reduction of network losses by 15.2%. In 1993, the natural gas consumption made up 40 m<sup>3</sup>/GJ. Currently, this index is 32-34 m<sup>3</sup>/GJ. Annual saving, as compared to the year 1993, makes up 3.5 mln. m<sup>3</sup> of natural gas. Besides saving of funds to the amount of 35 million Slovak korunas, there has also been achieved reduction of gas emission – carbon dioxide CO<sub>2</sub> and nitrogen NO<sub>x</sub>.
- 2. Reduction of heat consumption by 20% or 7-10 GJ/year per one apartment, which, as compared to the year 1993, corresponds to reduction of natural gas consumption to the amount of 2.8-3.0 mln.m<sup>3</sup> per year, and also – annual reduction of costs for maintenance of housing to the amount of 30 million Slovak korunas and further reduction of emission products CO<sub>2</sub> and NO<sub>x</sub>.

# Conclusion

- Execution of complex measures targeted to reconstruction of thermal economy of the town and modernization of the systems of heat supply allowed to decrease the amount of consumed natural gas as compared to the year 1993 from 19 million m<sup>3</sup> per year to 13 million m<sup>3</sup> per year.
- As it has been stated in the report, about 100 million Slovak korunas have been invested in the town's thermal economy since 1993. In the general amount of reduced natural gas consumption, the thermal economy makes 50%, i.e., 3.5 million m<sup>3</sup> of natural gas per year. Taking into account the current prices for gas (10 Slovakian krone/m<sup>3</sup>), the annual cost saving for natural gas makes up 35 million Slovak korunas.
- In the future, it is envisaged to further increase the efficiency of expenses for natural gas, the prices for which are constantly growing, at the account of rationalization measures, use of progressive technologies on the basis of low temperature principle, and extended reconstruction of the heat pipelines on the territory of the town. Due to that, there will be achieved constant reduction of harmful emissions on the territory of the town of *Michalovce*