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A SOCIAL CONFLICT – PRESENT AND A POSSIBLE FUTURE OF THE HEATING ENERGY DISTRIBUTION

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Abstract: In the article *A Social Conflict, – Past and Present of the Heating Energy Distribution* we have described the system of distribution the heating costs in block of flats renewed through "Panel Program" which is controlled by a Government Decree. We have looked at facts proven by data which testify that there are some flats, that are required to pay extra costs. In this article, we would like to present some suggestions and tools for giving ideas.

Keywords*: cost-sharing devices, heating fee, radiator, thermostatic valve*

1. INTRODUCTION

In the article *Social Conflict Caused by a Government Decree – Heating Energy Distribution in Blocks of Flats* we have described the system of distribution the heating costs in block of flats renewed through "Panel Program" which is controlled by a Government Decree. We have looked at facts proven by data which testify that there is a minority ownership, that is required to pay extra costs either because of their social status, or because of their flat's location within the building. In the summary, we suggested that it would be very necessary to create a commission with expert engineers, which would produce a proven accounting system based on numbers, facts and data. This would reduce the serious tension in the communities of blocks of flats. Although we still have to wait for the formation of this commission, in this article, we would like to present some suggestions and tools for giving ideas.

2. SHORT PRESENTATION OF THE CURRENT PROBLEM OF THE COST SHARING

In this section, we would like to give a brief introduction to all those who have not been convinced by the article *A Government Decree have caused social conflict – heating energy distribution in blocks of flats* that some of the furious owners of flats are right when they consider the government decree on cost sharing unfair and thoughtless. If the condominium wants to use a different kind of distribution, then

the government decree demands a complete, detailed energy calculation prepared by an expert.

Fulfilment of this regulation would mean such a great financial burden on the condominium budget that the community of owners cannot afford. Therefore, the owners of less-favoured flats are either trying to move away or have to accept the fact that they have to pay multiple fee to achieve same temperature as other flats. As evidence on this, we have collected the annually data on the largest and smallest heat-consuming apartments in the condominium *(Figure 1)*.

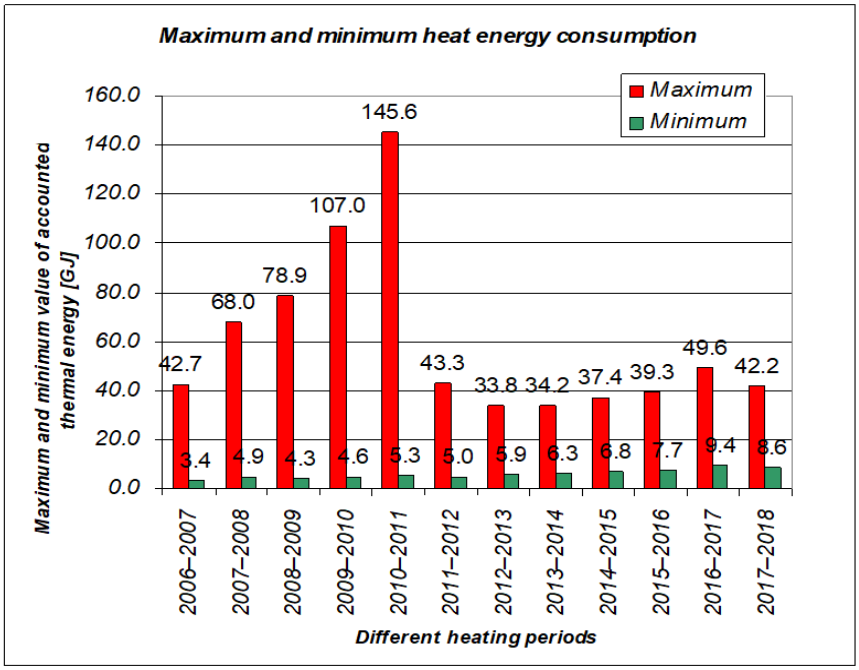

Figure 1. The most and least heat-consuming flats in the heating season of different years

The reason of the visible increase in the first part of the chart, is that people on the higher floors have realized over the years that they do not lose their comfort even if they completely shut off the radiator. On the other hand, people living in the ground floor apartments have been cold even when the thermostatic valves have been fully opened. It can be seen that in 2011 there was a difference of almost 28 times in the calculated heat consumption between two flats in one building. From a technical point of view, this is not a realistic result. After 2011, the introduction of the government decree on corrections and on maximum consumption, in particular the latter, has improved the situation significantly, but the difference is still remarkable. On average the amount of heat consumed by the largest heat-consuming apartments is 9 times the consumption of the smallest heat-consuming ones. This

represents a ninefold payment for the owners of flats with unfavourable location. Such a difference implies that the entire settlement system is incorrect.

In order to find out the reasons, we examined one arbitrary selected radiator of the condominium using a thermal imager camera *(Figure 2)*. Recording was done in a range of 18.1 °C to 42.1 °C with a Fluke TI 20 thermal imager. The uneven heat output of the radiator is clearly seen and the rectangular light blue area around the centre shows the location of the heating cost sharing device. At this point, the temperature of the radiator is significantly lower than on the incoming pipe, but it can also be seen that the lower part of the radiator is room-temperature, so no water flows through this area. This anomaly could be greatly improved by the diagonal connection of the radiator.

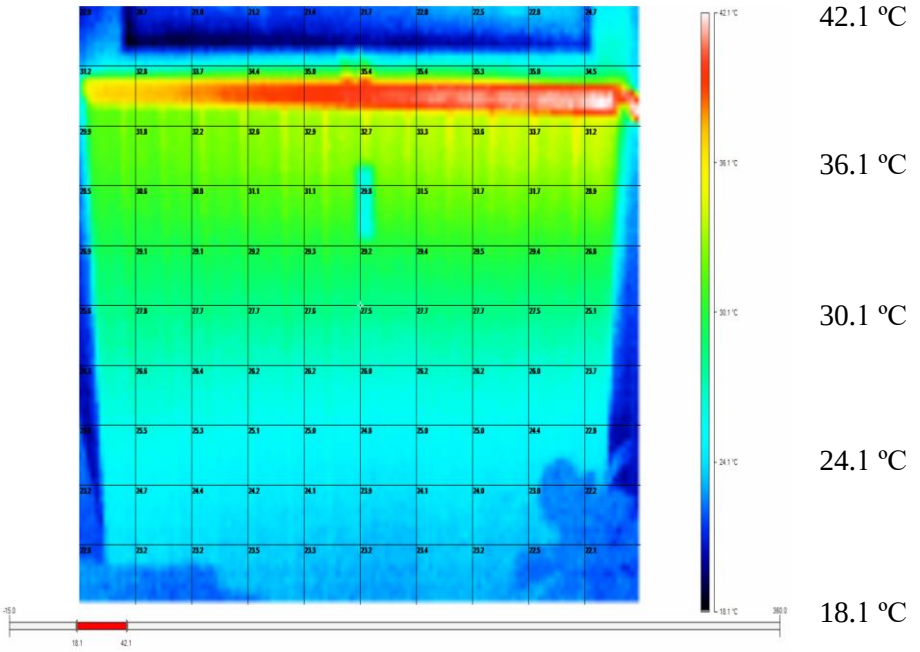

Figure 2. Recording of an arbitrary selected radiator using a thermal imager camera

We have also prepared the temperature dispersion diagrams of the above described radiator. They also show that the efficiency of the devices is very poor. The uneven heat output can have a causal relationship with the calculated heat consumption differences previously discussed.

On the basis of the facts described above, it can be concluded that under such conditions it is not possible to build a fair accounting system based on the heat cost-sharing devices.

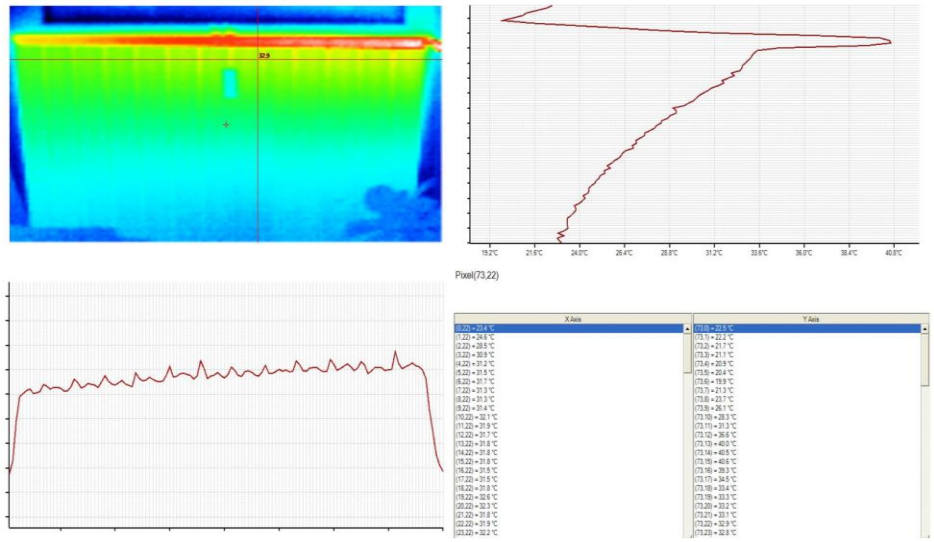

Figure 3. Temperature dispersion diagrams for the selected radiator

3. SUGGESTION FOR A DIFFERENT SETTLEMENT SYSTEM

According to our recommendation, the settlement system should not be built based on the value of the heat delivered by the radiator but based on the comfort of the apartment. This means that the same heat fee should be paid for apartments of the same airspace having an average temperature during the heating period, regardless of the location of the apartment within the building. Hence, apartments with lower average temperatures would cost less, and apartments with a higher average temperature would cost more, inversely than the current settlement system. However, the differences using this system would not be as huge, because the temperature values can spread within a building in a much smaller range. Of course, it would be necessary to discriminate negatively the owners who intentionally leave the windows open for a long time in their absence.

This accounting system would encourage the owners of too hot flats (because of the location) to further environmental awareness. In these flats, the owner would contribute to the insulation of the heating pipes with a so-called pipe shell. This could significantly reduce the total heat consumption of the whole building.

4. OPPORTUNITIES FOR IMPLEMENTATION

Suggestions and ideas are of no use if there is no adequate technical background for the implementation.

Fortunately, in the century of digital technology, there are temperature collectors available *(Figure 4)* – on a much lower price than the current cost sharing de-

vices – that can record the actual temperature in their internal memory at intervals of up to a few minutes.

Figure 4. Temperature measuring units with data storage

These data can be downloaded at the end of the heating season with an USB connector on a computer for further analysis. As a test case, we performed a series of such measurements in a flat. The result is shown in the diagram below *(Figure 5)*.

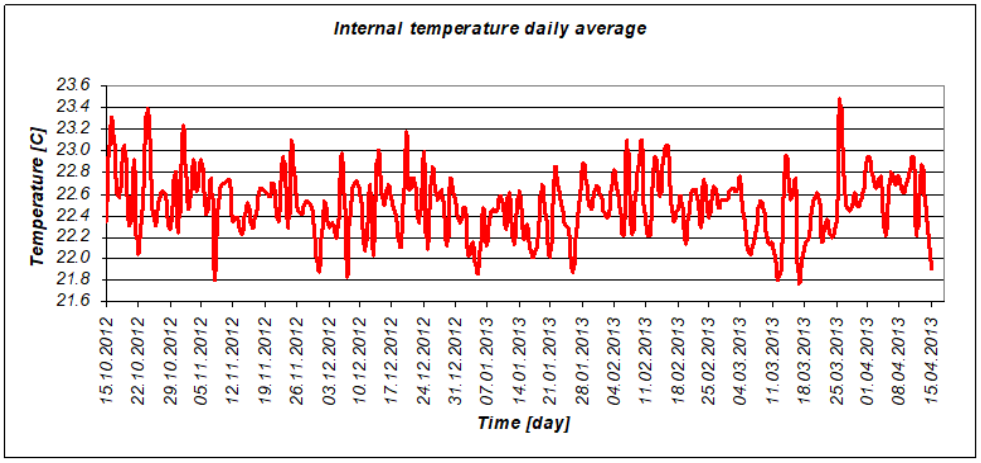

Figure 5. Temperature chart recorded inside the apartment in the heating season

It is important that not only the temperature of the apartment is taken as the basis of the settlement, but also the temperature of the external environment. Therefore, an external unit was also located which registered the outside temperature *(Figure 6)* in time synchronization.

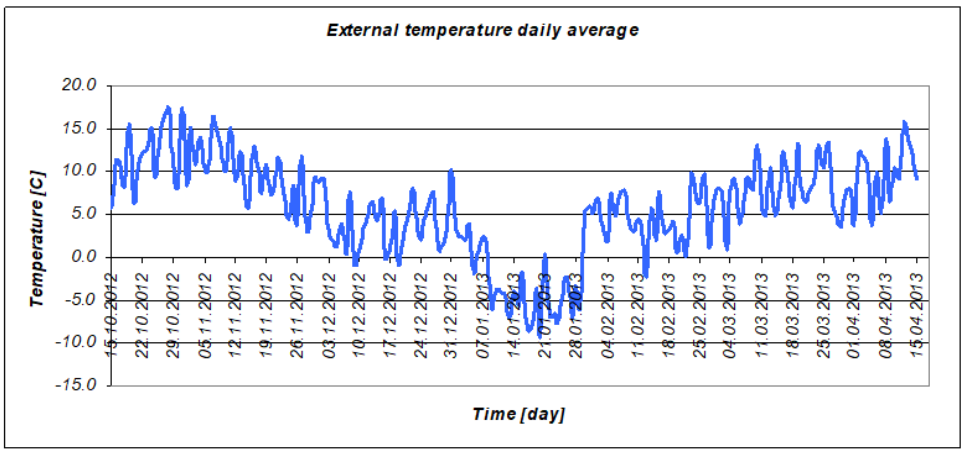

Figure 6. Temperature chart recorded outdoor in the heating season

The amount of heat delivered by the radiators is not the same as the difference of the two temperatures, but can be regarded as almost proportional *(Figure 7)*. By integrating the area below the curve, we get a so-called single metric (ºC unit), which characterizes the heat consumption of the apartment. In a warmer apartment we get a higher value, in a less warm apartment we get a smaller value, but according to our opinion and preliminary calculations, their greatest difference would be not more than 6–8 ºC.

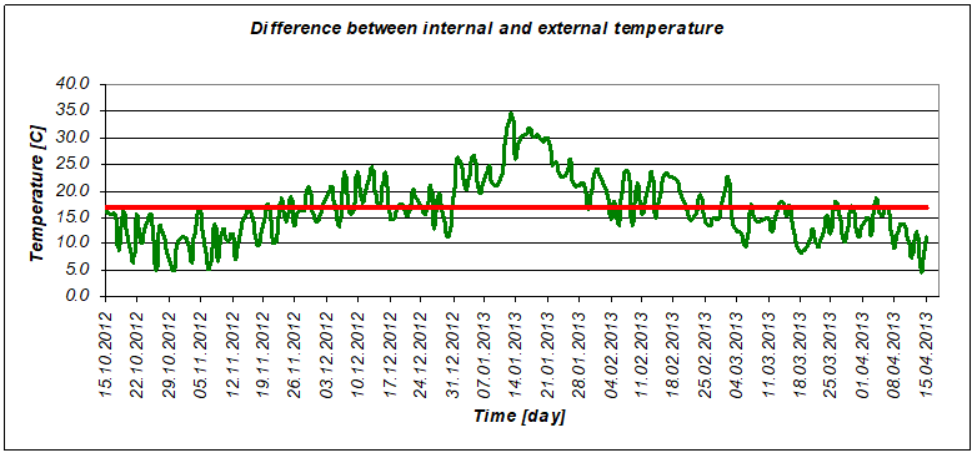

Figure 7. Difference of the internal and external temperature within a heating period

This would mean that the difference between the monthly heating bills of the flats could be much smaller (according to preliminary calculations, in worst case maximum a few thousand forints). However, in our opinion, this may be enough to mo-

tivate the residents to be economical and environmentally conscious. The introduction of this cost accounting system could create peace in the residential communities of condominiums through an appropriate burden sharing.

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