

## How to increase the energy efficiency of apartment housing

At one time it was proposed to transfer the heat supply of all apartment buildings and public buildings from centralized to autonomous, i.e. each building should have its own built-in, attached or roof [boiler](#) room. According to the initiators of this proposal, such a measure should have significantly reduced energy consumption (up to 30%). However, according to the experts, the implementation of such an event would require funds close to the ten-year budgets of the whole country, which is difficult to consider as a real proposal.

Proposals for the transfer of residential buildings to individual apartment heating were considered. Some cities even have completely abandoned the district heating of apartment buildings, and switched to apartment-by-apartment. Although such a solution is technically possible, it will not provide real energy savings, but rather will increase their consumption. In this case, there is a clear reluctance of local authorities to deal with issues of improving the efficiency of district heating and all the worries in this direction to shift on the shoulders of the population. In addition, the implementation of such an event requires the consent of all residents of each house to switch to apartment heating. Partial transition to apartment heating is almost impossible, as it will lead to a complete imbalance of the indoor heating system. It is difficult to get the consent of all apartment owners for such a reorganization.

The current government proposes broad support for electric heating. Using electricity for heating is basically a good solution. Especially considering the possibility of consuming cheap night electricity for these purposes. However, the transfer of multi-apartment housing to electric heating is almost unrealistic due to the inability of existing indoor power grids to cope with increasing loads.

It should be noted that each of the above measures in certain conditions can be quite effective. For example, all of them can be successfully used for low-rise individual housing. Autonomous heating systems can be economical when [building](#) a building on a separate site, when the laying of heating networks to it leads to a significant increase in construction costs or there is no reserve capacity in the heat supply organization to heat such a house. However, for most existing apartment buildings in large cities, heated by district heating sources, such solutions will be ineffective.

In the mid-1990s, I had to arrange the visit to Ukraine for the Danish Minister of Construction. During one of the meetings where our heating problems were discussed and when he learned that more than 80% of our high-rise buildings are centrally heated, he called it a national treasure. He motivated this assessment by the fact that in the experience of Denmark, where the rate of district heating is 70%, it is best adapted to thermal modernization. After the oil crisis of the 1970s, Denmark managed to reduce energy consumption by more than half due to the thermal modernization of the existing housing stock heated by centralized sources. Our closest western neighbors, Poland, the Czech Republic, and Slovakia, have followed a similar path.

Complete thermal modernization of the existing housing stock of Ukraine, which applies to almost all buildings built after 1993, is an expensive and long-term process. It includes the need to insulate the building's enclosing structures and upgrade its engineering systems. Of course, to do fully across the country would be an ideal solution, but it is an unrealistic task. It is necessary to break it down into real stages, which are the most feasible, require minimal costs and bring a quick and tangible effect. Based on today's realities, the first of such stages should be the equipment of all apartment buildings with metering devices for [thermal energy](#) consumption and heat points with weather regulation.

The validity of this approach is that it must adhere to the basic principle of energy conservation - regulation and accounting. We already had a state program to equip existing housing with meters,

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and its efficiency is zero. Heat supply organizations supplied as much heat as they considered necessary and the consumer could not influence it. The consumer knew how much energy he received and had to pay for it regardless of their real needs. Hence the "underflows", "overheats" and open windows. Weather regulation will allow us to avoid all this and to approach optimum energy consumption. At the same time, it is very important that each apartment owner sees that in the colder months of the year they pay more, and in the less cold - less in their payments for thermal energy. Thus, the population will practically feel the impact of accounting and regulation on the cost of heat consumed, and will create a basis for a successful transition to the next stage - the organization of apartment accounting and regulation.

The organization of house metering and weather regulation of consumed thermal energy deserves the development of a special state program due to its high efficiency, low cost (compared to other stages) and quick payback. Hundreds of projects on household accounting and weather regulation have already been implemented in Ukraine. All of them showed high efficiency - reduction of heat consumption by an average of 30% and payback periods within one year.

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