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POSSIBLE WAYS OF UTILIZING THE ENERGY EFFICIENCY POTENTIAL OF RURAL AREAS

MOŻLIWE SPOSOBY WYKORZYSTYWANIA POTENCJAŁU WYDAJNOŚCI ENERGETYCZNEJ OBSZARÓW WIEJSKICH

Key words: energy efficiency, energetic self-preservation, financial situation of local governments and households, necessary steps

Słowa kluczowe: wydajność energetyczna, samowystarczalność energetyczna, sytuacja finansowa lokalnych rządów i gospodarstw domowych, konieczne kroki

Abstract. Reducing greenhouse gas emissions, increasing energy efficiency and using more renewable energy play an important role in European Energy Policy. Rural development should rely on the efficient use of local socio – economic – environmental resources. In Hungary, energetic self-preservation is a problem for households and local governments, even though wasting energy and poverty are both characteristic of them. 29.4% of produced final energy is consumed by the residential sector, and 15% is consumed by the (local) governmental sector. Paradoxically, increased investment activity related to EU applications had a negative impact on the financial position of local governments. The main reason for this situation was a lack of local governments' own resources to cover the payment need of EU investments. In many cases this operation failed to result in additional own revenues and significant savings in expenditures. Furthermore, in 2010, an average Hungarian household spent 6.4% more money on home maintenance and household energy (and 6% less money on food and soft drinks) than in 2000. Various steps should be taken in order to change people's environmental or energetic approach and increase community awareness. In the results of this study, I expound three case studies to justify the mentioned facts and describe the steps needed to be taken.

Introduction

Nowadays, it is important to deal with energy efficiency problems. Hungary has become overly dependent on fossil energy sources, which has resulted in depletion. Moreover, these energy sources have become quite expensive. Reducing greenhouse gas emissions, increasing energy efficiency and using more renewable energy play an important role in European Energy Policy [*Communication from...* 2007]. This theme's legal basis is, inter alia, the 2006/144/EC European Council Decision on Community strategic guidelines for rural development and the Opinion of the Committee of the Regions about energy efficiency. According to various studies [Lányi 2012, *The Climate Paradox...* 2007] rural areas and local governments will play an important role in spreading environmentally conscious and developing methods of energy efficiency because the energy efficiency (and climate) awareness of citizens can be strengthened by public and municipal institutions.

Rural development should contribute to the development of sustainable systems; it should rely on the efficient use of local socio-economic-environmental resources. Appropriate rural development measures help establish local material and energy management systems. Serious steps should be taken against climate change and energy waste. Unfortunately, they are difficult to communicate to people. It is important to make these decisions using legislative bodies close to citizens. In Hungary, energetic self-preservation is a problem for households and local governments, even though energy waste and poverty are both characteristic of them. In the past few years, the financial situation of many Hungarian local governments – mostly counties, larger towns, but some smaller ones too – has become very difficult. Still, only a few Hungarian local governments employ energy and climate experts, whose role it is to contact authorities, non-governmental organizations, residents, coordinate the work on energy efficiency and climate change, monitor climate protection tender opportunities, prepare tender documents, and finally participate in the implementation of the projects.

Material and methods

The aim of this essay is to show that energy efficiency can play a very important role in rural development, furthermore helps to solve the energetic self-preservation difficulties of Hungarian municipalities and households too. My method, I use in this paper is showing the importance of energy efficiency by statistical data then provide information about certain financial problems of Hungarian households and municipalities recently. In the second part of this paper I make some theoretical expectations (against local governments) and practical examples (to follow and not) known. I believe that these identified problems can be solved only in the described manner.

Results and discussion

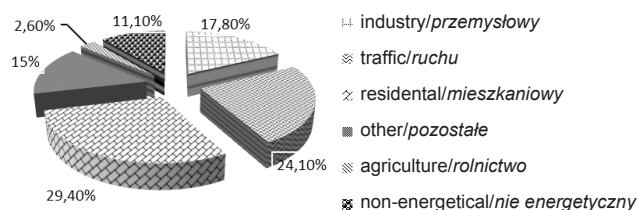


Figure 1. The final use of energy according to sectors
Rysunek 1. Końcowe zużycie energii według sektorów

Source: own study based on Fábíán 2011

Źródło: opracowanie własne na podstawie Fábíán 2011

The main features of Hungary's energy consumption.

From 2008 to 2009, the energy consumption index in Hungary significantly decreased [CSO 2010], yet increased in 2010. That year the relative energy intensity of the economy decreased by 0.7%, while the GDP index increased by 1.7%. Domestic electricity production continued to grow in 2010 by 4.1% more than in the previous year. Almost

half of the mentioned energy was produced from fossil fuels – mainly coal and gas – and 42% of this energy was produced by the nuclear power plant. In Hungary, 29.4% of produced final energy is consumed by the residential sector, and 15% is consumed by the (local) governmental sector, inter alia (Fig. 1).

The reasons of energetic self-preservation difficulties in Hungarian municipalities and households. Secondly, data about the economic situation of Hungarian municipalities and households in general was examined. Paradoxically, increased investment activity related to EU applications had a negative impact on the financial position of local governments [Domonkos 2012]. The present EU financial support system is not working appropriately because resources should be made available to support operations and constructions. It was announced in October, 2012 that the state would assume the full debt of settlements which have less than 5000 inhabitants and partly assume the debt of larger settlements. The financial balance of local municipalities deteriorated between 2007 and 2010. Municipality bank debts increased by 77.7% [Hunyor 2012]. The main reason for local governments' debt was a lack of own resources to cover the down payment needs of EU investments. Local governments used property, which failed to cover loans. The forms of indebtedness consisted of operating credits, investment credits from banks and bonds. The biggest increase could be observed in the field of bond issues [Vas 2011]. The non-operating budgets of every Hungarian municipality had deficits in every year between 2007 and 2010. There are commitments the repayments of which are not assured because of increased investments. Another risk factor concerns the future management, operations and sustainability of facilities established by previous developments [Annual monitoring... 2012]. Another problem is that in many cases the operation did not result in additional own revenues, and significant savings in expenditures. In the past few years, the investments main goal did not involve improving equipment used in obligatory municipal tasks nor the efficiency of tools [Domonkos 2012]. Operating incomes of local governments declined steadily from 2008 (from 2007 to 2010 operating incomes decreased by 55.8%) [SAO 2011]. Material expenses spent on public institution operations were very important items of municipal budgets. Their energy (utility) costs increased. The growth rate of energy was higher than any other material expenses growth rate [Kovacsics 2003]. Communal consumers represented an increasing proportion in the national energy balance. The municipalities' material expenses, which are controlled by the State

Audit, increased by 136.8% between 2007 and 2010. During the decision-making process, priority was not given to repayment requirements but to compulsory tasks, the improvement of equipment efficiency, and the preservation of existing assets. Moreover, because most Hungarian municipal buildings are old, their maintenance is also expensive. Hungarian local governments spent EUR 345 million (totally) on energy expenditures [Fábián 2011]. The local governments' main reason for energy investments was maintenance [Kovacsics 2003]. Energy efficiency improvements have many benefits. However, the approach of local governments and residents needs to change. This pertains not only to climate protection and morality but expenditures too. In 2010, an average Hungarian household spent 6.4% more money on home maintenance and household energy (and 6% less money on food and soft drinks) than in 2000 (Fig. 2).

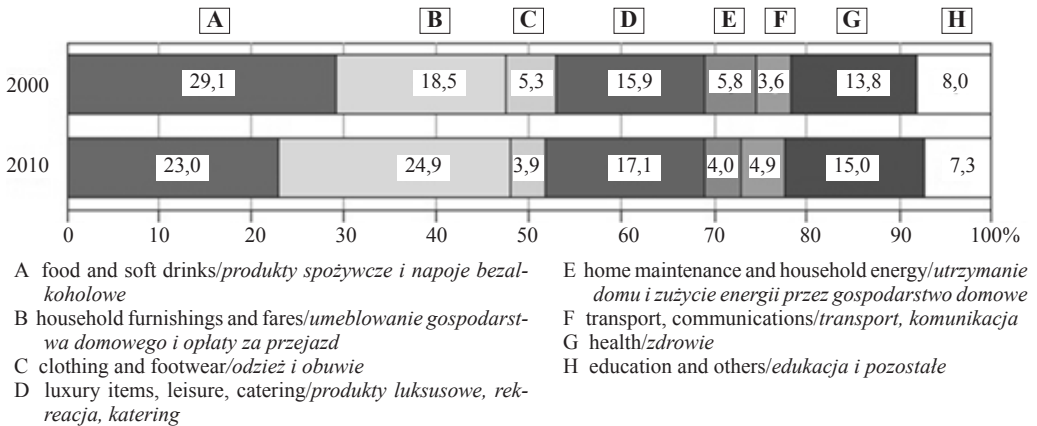


Figure 2. The structure of per capita expenditures of an average Hungarian household
Rysunek 2. Struktura wydatków per capita statystycznego węgierskiego gospodarstwa domowego
 Source/*Zródło*: Regional differences... 2011

What should we do? Among municipal energy management measures (Fig. 3) firstly, preventive or mitigation measures should be developed, because ensuring energy efficiency and using more renewable energy will enable the reduction of greenhouse gas emission and prevent or slow down climate change. It is essential for local governments to be able to meet energy efficiency requirements in their everyday management as well as creating energy efficient operations in public buildings. That is why it is necessary to introduce energy efficiency requirements to the relevant legal provisions for local governments. In addition, it is important that each municipality, with more than 1000 inhabitants, employs at least one climate rapporteur or energy professional. To achieve these goals the local governments' participation in applications should be made easier. Various steps should be taken in order to change people's environmental or energy approach. Residents need to become aware that they belong to a community. If steps are taken to create energy efficiency local governments/communities, it will be possible to use their local energy resources and create jobs.

Case studies concerning the creation of energy efficiency in Hungarian municipalities. In order to justify the abovementioned facts, energy efficiency measures, taken recently in two small towns, were examined. The first case study concerns a community, which made some bad decisions in the past and is attempting to resolve the resulting problems. Some months ago, an interview was conducted with Mr. László Zsuffa (Co-Energy Ltd., Budapest), the project manager of the biomass based heating system. The second case study (interview with Sándor Nagy dr., mayor) involves a very committed, energy conscious mayor and his town. Some really important investments were realized there, but creating a livable and sustainable town is a more important goal to the mayor than publicizing results.

The third case study concerns a special project of Szent István University, which offers an environment and energy conscious course to parents returning from child care in order to help their reintegration into the labour market.

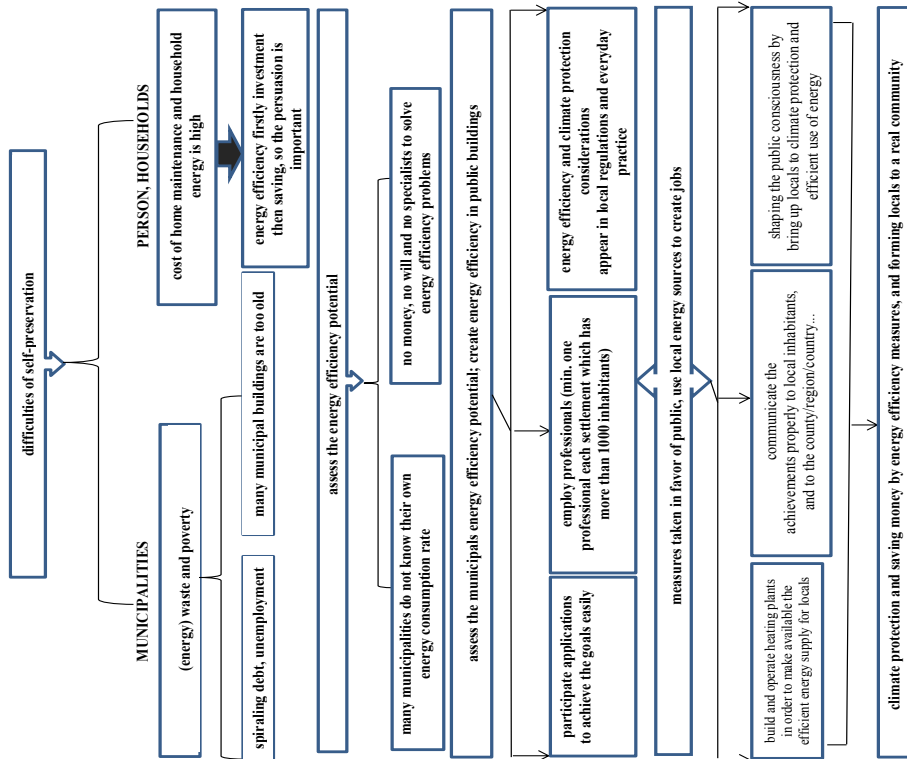
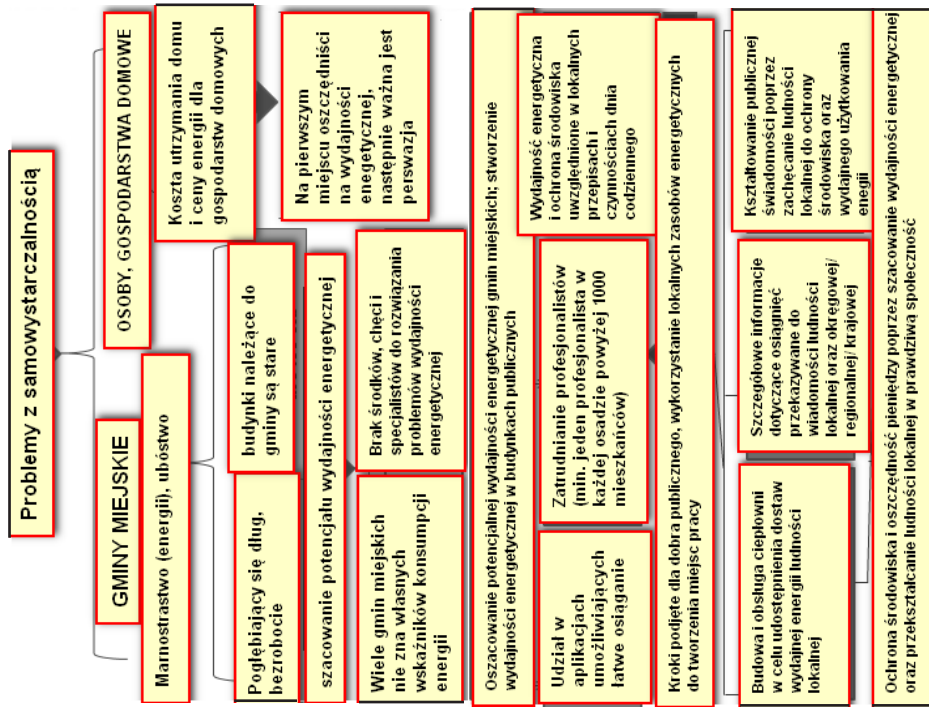


Figure 3. Summary and overview diagram of ways of utilizing energy efficiency potential
 Rysunek 3. Diagram przedstawiający streszczenie i ogólny zarys użycia potencjału wydajności energetycznej
 Source: own study/Źródło: opracowanie własne

The first case study. In the early 2000s there was no piped gas service in Pornóapáti or the surrounding small settlements very near to the Austrian border. Instead of using stoves (and working a lot) the major of Pornóapáti chose to establish a biomass-based heating system in every household in the village. In Austria, eight similar heating systems were in use at that time, but the price of piped gas was 2.5 times higher than in Hungary. A village assembly was convened in Pornóapáti and 74% of the inhabitants said yes to the project. Other villages preferred to sign contracts with gas companies. Pornóapáti was able to obtain a lot of support for the project (app. 85% of all costs), ready for the start of the heating season. At the beginning, 86 out of 124 potential households and other consumers connected to the new heating system (4.5 kilometers of the main heating pipe was constructed). From the very beginning its value declined, furthermore every connection was very expensive. As the system's operating parameters providing domestic hot water were unprofitable, many consumers did not ask for it. The efficiency of this heating system ranged from 53% to 57% and only 70% of the system's capacity was utilized at the beginning. Today, only 50% of potential households and other consumers get energy from the biomass-based heating system and that is why the operation is in the red (producing losses). The village would like to get energy (mainly electricity) from a very small hydroelectric power plant, which was constructed two months ago.

The second case study. The administrative area of Vértesszőlős is quite small. That is why establishing industrial parks or big agricultural areas are impossible. Its small area is the reason why there is no chance to designate as much residential area as the municipality would like, therefore the prices of building sites are high. Since the 1970s, many people have been moving from the neighbouring big towns, mostly affluent young people. The Mayor's main goal is a livable and sustainable ("pain-free" savings) town and transparent management. In 2010, the town spent about EUR 43 000 on electricity bills, and about EUR 32 000 on gas bills. The town received approximately EUR 215 000 from the Energy and Environment Operative Program (co-funded by the European Regional Development Fund) for full energy reconstruction of the cultural centre of the village, the mayor's office, the school, and so on. Currently 17 projects are underway; 2 out of 9 applications for EU funds are rejected every year. In Vértesszőlős not only the mayor, but the notary monitors energy bills every month. The municipal is in contact with Greenpeace; and two tree planting events are held every year by the municipality, NGOs and head of municipal institutions. It is the third year running that pruning waste is collected from residents by the municipality. In 2011, the Vértés Power Plant used this pruning waste, but from the second half of 2012, the municipality has been using it in new local biomass furnaces. The most important energy-conscious step is to acquire EU resources to achieve a 50% reduction in energy consumption by September 2012, but the main goal for 2020 is to achieve energy independence.

The third case study. It pertains to a special project of the Szent István University Faculty of Agricultural and Environmental Sciences and three NGOs with the support of the EU from September 2012. The University offers special ecotourism and organic farming training to parents returning from child care in order to help their reintegration into the labor market. 60 mothers (out of 230 applicants) will be involved in the training from the Gödöllő, Veresegyház and Aszód micro regions. Most of the applicants have 1-2 degrees (teachers, economists, media professionals and IT professionals) and they have definite ideas about the utilization of knowledge. The training will be composed of the following modules: eco-farming and energetic skills, rural development, eco-housekeeping, eco-tourism as well as legal and business skills. During and after the training, the participants will get personalized advice and help on how to become self-employed.

Conclusions

Energy efficiency – nowadays, especially in Central-Europe – has a special significance, because of financial not just environmental reasons. The financial situation of Hungarian local governmental sector has been difficult because operating incomes declined steadily and they did not have enough own resources to cover the down payment needs of EU investments. Meanwhile Hungarian households also have had energetic self-preservation difficulties. Hungary has a great

energy efficiency potential because energy waste and poverty are both characteristic of Hungarian municipalities and households. That is why the energy efficiency and climate awareness of citizens have to be strengthened by public and municipal institutions. Unfortunately in Hungary there are no appropriate specialists and energy management is not a compulsory task for municipalities. What is more, there are no local energy efficiency or renewable energy action plans. All of this is due to a lack of interest and motivation. The special handling of energy data is a problem for municipalities. The few good examples are due to special, unique professionals or a mayor's hard work. Their work needs to be prioritized and widely publicized. Energy efficiency can be achieved if municipalities, geographically relatively close to each other, have common economic and social goals and work in close collaboration. Functional, reliable and small projects are necessary.

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Streszczenie

Zmniejszenie emisji gazów cieplarnianych wydzielanych przez szklarnie, zwiększenie wydajności energetycznej i wykorzystanie energii odnawialnej odgrywa ważną rolę w Europejskiej Polityce Energetycznej. Rozwój obszarów wiejskich powinien opierać się na wydajnym wykorzystaniu socjalnych, ekonomicznych i środowiskowych zasobów. Na Węgrzech samowystarczalność jest problemem również dla gospodarstw domowych oraz władz lokalnych, mimo że marnotrawstwo energii jest powszechne. 29,4% wyprodukowanej energii końcowej jest zużywana przez sektor rezydencjalny, a 15,0% przez (lokalny) sektor rządowy. Paradoksalnie zwiększone inwestycje wynikające z aplikacji UE mają negatywny wpływ na pozycję finansową lokalnych rządów. Główną przyczyną niewyplacalności lokalnych rządów był brak środków na pokrycie inwestycji UE. W wielu przypadkach zabieg ten nie generuje dodatkowych zysków ani znacznej oszczędności wydatków. Ponadto, w 2010 r., w statystycznym węgierskim gospodarstwie domowym przeznaczono o 6,4% więcej środków na utrzymanie domu i energię (i o 6% mniej na produkty spożywcze i napoje bezalkoholowe) niż w 2000 r. Aby zmienić podejście ludzi do kwestii środowiskowych i energetycznych należy podjąć konkretne kroki.

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