

Ideas of the Renewable Energy in Climate-Strategies of Medium-Size Hungarian Cities

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Abstract: In our paper we would like to give a short insight to the circumstances, possibilities and alternatives, which can promote or hinder the application of renewable energies in Hungarian medium size cities. As a first step we analysed and compared the climate strategies of Hungarian settlements to European examples. The results show that the examined interior strategies contain almost the same adaptation and mitigation topics what we have found in the climate strategies of the European cities. However we still feel the differences! That is why we tried to unfold the main factors which are necessary for successful switchover processes on the selected settlement level, and explore how the decision makers thinking about the role of renewables, mitigation and adaptation in local space. With the help of local experts and case studies we faced with several positive and negative (optimistic and pessimistic) factors, we identified basic problems but also good practices and we tried to outline (and emphasize) the usability of renewable energies for smaller populations. We hope that our specific results can help the local intentions, and give useful information and pointers for environmentally-conscious municipalities.

Keywords: climate strategies, renewable energies, medium size cities

1. Introduction

Adaptation to the expected impacts of climate change becomes a central question in Hungary as well, which can be seen in different research projects, documents and institutions such as VAHAVA (2003–2006), National Climate Change Strategy (I. II.) or foundation of National Adaptation Centre. We can find several provisions and specific pledges in this theme among the objectives of the European Union until 2020: from elaboration of adaptation strategies and increase of energy efficiency until decrease of greenhouse gases emission or increase of renewable energy's ratio. Hungary wants to achieve the EU expectations with operative programmes and tenders which connect to the 2014–2020 financial planning period. Together with this, Hungary is promoting struggle against climate change, wherein renewable energy sources come to the front. In the last decades our knowledge about climate

change has expanded, and nowadays changes of climatic elements and its consequences are considered as facts by most people. Mankind has realised that it must face these changes (Stern 2006, Csete et al. 2007).

Similarly to many countries of the world, Hungary recognized the importance of mitigation and adaptation to climate change. The National Climate Change Strategy, or other documents and initiatives, like Climate Friendly Municipalities Association or Energy Efficient Settlements Association help to achieve this. All these are integral parts of the process to prepare the society for the challenges of climate change, and lead to energy efficiency, environmental urban planning and application of renewable energies. Therefore in our research we focused on the local answers for the challenges of climate change, climate strategies of European and Hungarian cities and focuses for renewable energy.

2. Methods

We used the following methods in our study: first, we reviewed the significant international results of climate protection, the main principles of climate policy in the European Union and Hungary, the existing research papers about the climate strategies of European cities and we analysed the climate strategies of the Hungarian medium size cities. After that, we prepared experts interviews with the prominent persons who participated in the preparation of strategies or working in local climate associations. They have appropriate insight on the effectiveness of the local climate protection programs.

The main aim of our work is to compare the climate strategies of medium size cities³ in the EU and Hungary and to investigate the possibilities of Hungarian climate protection, in particular with regard to renewable energies. Since climate strategy is not a mandatory urban planning document, in the case of many cities it is only exist as a part of other larger urban document (Integrated Urban Development Strategy, Environment Protection Programme etc.). These „hidden strategies” show that concerns about environment still play a significant role in development planning, although there are no separate climate documents. According to our experience, these strategies are not adequate documents, but sometimes more detailed than the earlier strategies, and in some cases concrete climate protection plans can be found in these programmes. However, we used only separate climate or energy strategies, partly because of their international comparability, and partly because – according our pre-conception – these separate strategies may show stronger commitment towards adaptation.

³ In the Hungarian settlement geography, medium size cities usually defined as cities with 20–100 thousand inhabitants. We used different categories and defined medium size cities as cities with 10–110 thousand inhabitants.

3. Result and discussion

3.1. Climate strategies in European cities

The sustainability (or its absence) of the European cities has been in the focus of the attention, especially in the case of those cities which were affected by extreme weather events linked to climate change. The first extensive European survey with consistent methodology has been made by Reckien and colleagues (2014). In this survey they investigated 200 cities from 11 countries. They examined whether these cities have climate strategies or not, the content of these strategies (whether they only include mitigation plan or contain elements of adaptation too), what measures are mentioned and what commitments are present in these documents in order to reduce GHG emission. The investigated cities comprised 16.8 % of the population of the EU27 in 2008, and they involved in the Eurostat 'Urban Audit' monitoring programme. The examined cities had more than 50 000 inhabitants.

According to our results, 65 % among these 200 cities had mitigation plan, but only 28 % of them had adaptation documents, and a significant part of the examined cities had no concept about climate change at all. There are significant differences between the countries. For example, 93 % of settlements in the UK had at least a risk management plan, but this ratio in Belgium and France only 43 and 42 %. Adaptation plans exist only in connection to mitigation documents in every case. These plans can be found in the UK in highest proportion (80 %), while second and third places are Finland and Germany with 50 and 33 %. However, these two documents appeared integrated in only 22 % of the cases, so there may be significant reserves in this area, according to the authors of the survey.

In both type of planning documents, the frequency of mentioned measurement were analysed (Fig. 1.).

The results of Reckien and colleagues (2014) show that there are significant shortcomings in the planning and preparedness of the European cities in relation to the climate change, and mostly only the larger cities targeted specific goals of climate protection. This highlights that settlement size is an important differentiating factor in this regard, the medium size cities of Europe with a population between 50 000 and 250 000 are less dynamic and innovative in the climate protection than the larger ones. According to Dormois (without year) the reasons are the following:

- These settlements are very closely located to the idyllic rural landscapes so it is hard to sell the additional costs of “green developments” for the potential urban buyers.
- The typical settlement-environmental conflicts like traffic jams are not so dramatic to force the people to choose more environmentally friendly ways of travelling, which undermines the financial support of green development.

- In the era of globalisation, the headquarters of the international companies are located in the large urban centres, so the available financial support for green development are generally more limited in the medium size cities.

Since the financial background and the attitudes for eco-friendly green developments are controversial, the medium sized cities have to implement a more innovative communication to generate climate-friendly local economy and lifestyle, and they have to integrate the new ideas into the city’s development, documents and daily routine.

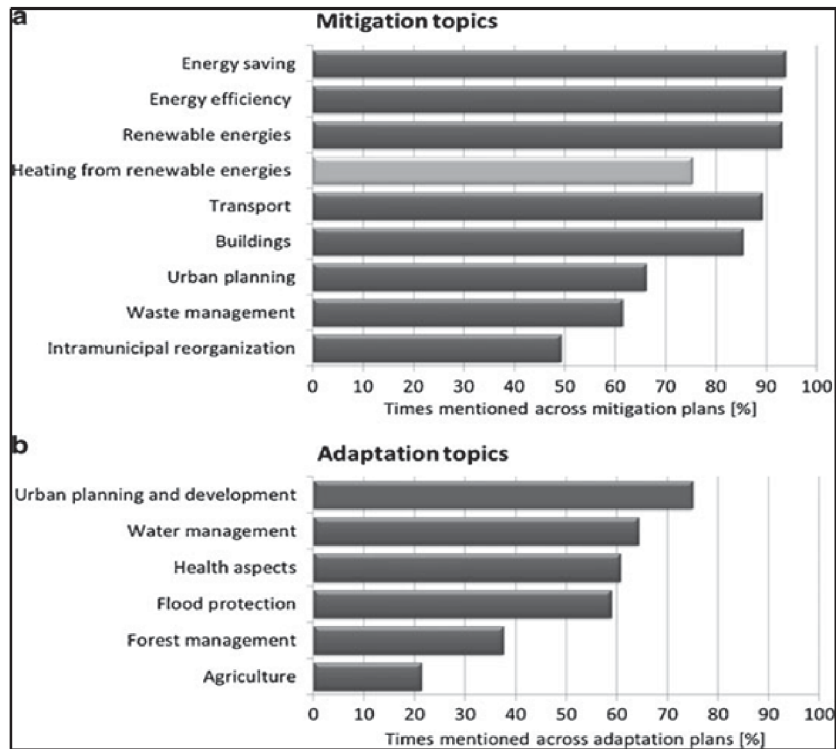


Figure 1. Topics of the mitigation and adaptation plans across Europe (%)
 Source: Reckien et.al. (2014)

3.2. Climate strategies and issues of renewable energy in Hungarian cities

The local climate protection efforts in Hungary are mainly embodied in the climate protection organizations. According to our research we must mention those recently active organizations which are able to mobilize both local governments and civil society. These include the Climate Friendly Municipalities Association (with 18 mem-

bers) and the Energy Efficient Governments Association (has 24 members) (<http://klimabarat.hu>, <http://ehosz.hu/szovetseg>), as well as the Hungarian Climate Alliance whose members include 13 NGO's and 7 municipalities (<http://www.eghajlatvedelmiszovetseg.hu>). It is worth pointing out that although the areas of climate protection and energy efficiency are very close to each other, the overlapping between these organizations is minimal. We found only two cities – Gödöllő and Tatabánya – who are members both of the Climate Friendly Municipalities Association and of the Energy Efficient Settlements Association. The number of Hungarian cities which have climate strategy is very low in international comparison. Until this time, only 10 medium size cities prepared publicly available climate strategy, but some of these documents are only „water management climate strategies” (such as in the case of Vác and Pomáz). These documents only focus on water management issues like flood protection and rainwater management. Some of the other strategies put the focus on energy management and efficiency.

Nowadays we have found several background materials, scientific and policy documents – like the Climateguide edited by Fülöp (2009) – that can be useful for the Hungarian settlements to prepare an elaborate climate strategy. According to the aforementioned Climateguide, the first (and most important) steps are revolving around energy, like founding local energy committees, creating an energetic database and preparing local energy-conceptions. Almost all of the climate concepts contain the land-, water-, and forest- management, flood protection, heat and UV action plans, but the recommendations of the Climateguide also point out that in Hungary, local energy management and the increased use of renewable energy is considered as the most effective way to mitigate the effects of climate change. We also carried out an analysis of the targets of these documents to compare them to the international results (Fig. 2).

It can be seen that most of the local climate strategies contain almost every topics with the exception of the need for restructuring of the public services (intermunicipal reorganization). This feature is an important difference between domestic and international climate strategies, which shows, domestic strategies consider every topics important in theory, but the realization is weak in practice in many cases. However, the presence of the topics does not reflect to the different emphasis each strategy has. The analysed climate strategies pay particular attention to the question of energetics which supports our hypothesis that energy management is one of the most important topics for the settlements. These goals and objectives are related to the topic of mitigation, so it shows us that the current documents are emphasising the prevention of climate change instead of adaptation. This is similar to the European experience. However there is a significant difference, because the integrated approach is common in Hungarian documents, and every strategy includes both mitigation and adaptation topics.

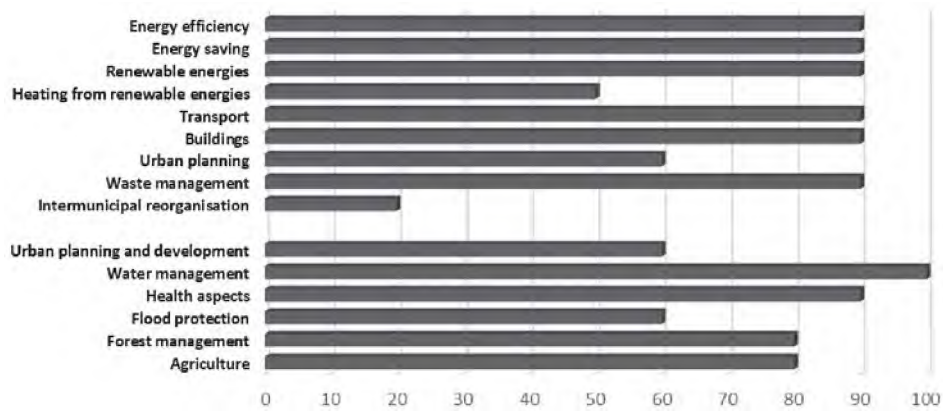


Figure 2. Topics of mitigation and adaptation (%) in the examined Hungarian climate strategies

Source: Own elaboration from Hungarian climate strategies.

In addition to mitigation topics in European cities, Hungarian possibilities mentioned in the city strategies are the following:

- reducing emissions, CO₂ sequestration
- development of monitoring network (e.g. air pollution)
- increasing green areas and green roofs
- landscape rehabilitation
- awareness for mitigation

According to national documents it can be concluded, that the first starting point is the energy efficiency. The use of renewable energies is the second step, but it should be incorporated into the local development if we would like to achieve visible results.

Based on the above mentioned experiences we examined the possibilities and hindrances of increasing the use of renewables.

We have selected six settlements, where we analysed the local climate strategies and conducted interviews with the prominent experts on the subject. The experts also agreed on that energetics will have the most important role in climate protection in the future. These experts work in local governments in cities with climate strategies. They were contributors in creation of climate strategies and they are the responsible of realization in it. Their opinion not only a subjective opinion but represents a wider community.

We need to understand that one of the key main causes of the climate change is the emission, which related to the use of fossil energy sources. There are two different ways to cut down the amount of energy: reduce the use of energy or increase

the efficiency. In this approach it does not matter that the energy is come from fossils or renewable, because the reducing of emissions will be realised. The possibility – that we decrease the emission with the use of renewable sources – is definitely positive, but currently this idea is not a priority for most municipalities. However there are some exceptions as good practises. There are among the municipalities who have been invested work and attention to create their own climate strategies. These settlements have confirmed the importance of responsibility, climate-consciousness and behaviour both in individual and municipal level. With shaping attitudes the popularity of renewables can be enhanced. Following the climate-conscious comments; in our opinion the local governments, (in partnership with the civil society) can invest for green goals even though there is not enough governmental support or funding sources. This is supported by economical calculations (e.g. Eger) which demonstrate the advantageous effects of energy investment (opposite of investments such as other infrastructure). So the renewable energies probably have local benefits in long term consumption.

According to the experts, the alternative technologies which are necessary for the change of attitude – are already available for Hungarian cities, moreover, the „hardware background” of renewable energies has become more affordable in recent years. In relation to economic sustainability, there is no consensus yet; the dilemma of solar energy use is a good example of it. Some experts predict a rapid spread of solar energy, while others believe that solar energy use is only a marginal, „prestige item” of energy production. It would mean that the use of solar energy would not take a break in Hungarian medium size cities. This view is supported by the fact – which is a sceptical opinion of specialists –, that these energy sources would be used in a much larger volume, if climate protection and use of renewable energies would also mean significant economic savings and not only an environmental benefit. They add: “Only a few municipalities, institutions, enterprises, urban residential communities or individuals can afford long-term profitability developments on the base of renewable energies.”

Despite some disagreements all experts agree on that „not used energy is the safest, cheapest and most environmentally friendly energy”. Taking this into account, and on the basis of the climate strategies, the greatest possibility for energy saving is reducing urban electricity consumption in medium size cities. The existence of a modern, efficient district heating system is an important issue in energetics of surveyed cities. Development of district heating is a possibility not only as a saving solution, but possible transition to renewable energy, which means geothermal energy and biomass mainly. Use of biomass – as renewable energy – for district heating is beneficial only in that case, if mining, primary processing and utilization are local. Also, biomass production requires an extremely complex care in landscape and environment.

4. Conclusions

Sustainability, climate protection, energy management, renewable energy sources are closely related concepts. During our research we have tried to outline some important aspects of climate protection focused on renewable energy. For this reason we analysed local climate strategies, possibilities, limits and other circumstances using the example of medium size cities (with climate strategy) in Hungary.

Climate strategies assign an important role in the renewable energies. Despite, this way has too much difficulties, for example the policy about energetics. We should realize the fact: nowadays the nuclear power is the main factor in the energy management of Hungary. It seems that the use of renewable energy sources (next to the conservative methods of energetics) is limited to a rather narrow circle. The environmental acts and the lack of financial resources are also make difficulties to transition for a new environmental paradigm. The current national practices have strong influence on local considerations. The current price level of fossils is still lower, so the renewables are suffering from a competitive disadvantage, and the rate of investment are below than in other European countries with best practices (e.g. Austria, Germany). In contrast to these facts some local social community and decision maker have realised, that energy saving may lead to financial savings and able to bring direct benefits to local governments. This recognition put the energy efficiency, the improvement and modernization to the focus in this sector. The renewables can play an important role in this process, but the settlements have to keep in their mind that the use of renewable depends on local conditions, because the opportunities are spatial-specific.

Therefore the current reality is that renewable energy use is ranked behind energy savings and efficiency in the examined settlements (and in the similar cities). However we are witnessing the transition to a new kind of energy thinking and management and the increasing popularity of renewables in several domestic settlements. Many people have already strong confidence that the reduction of emissions and use of renewables can contribute to climate protection, and also lead to economic benefits in local scale.

Conflict of Interest

The authors declare no conflict of interest.

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