What's wrong with energy efficiency?

A comparative analysis of the barriers to municipal investments in energy efficiency in Bulgaria, the Former Yugoslav Republic of Macedonia and Hungary

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Abstract
It is widely recognized that many cost-efficient opportunities to employ end-use energy efficiency measures exist in countries in transition (CITs) and that municipal authorities have an essential role to play in taking these opportunities. For a number of reasons, however, local authorities do not always do this.

The purpose of this paper is to review, compare and critically assess the determinants that influence the motivation of local authorities in Bulgaria, Macedonia and Hungary for investing in energy efficiency interventions. The factors are examined by looking at the existing barriers that hinder energy efficiency investments at a municipal level and especially those barriers that are directly related to the current status of local government. Two broad groups of problems are discussed here: local functions, especially energy-related tasks of municipal authorities, and finance. We explain how inconsistencies within these two areas influence the motivation of local authorities for investing in energy efficiency and their capacity to do so. We argue that greater decentralisation is the first step in giving local authorities the incentive to reduce wasteful expenses from the municipal budget.

Based on the analysis and the comparison, we give recommendations for concrete policy action in each country to remove the existing obstacles that inhibit local authorities from making cost-efficient investments in energy efficiency improvements. Municipal ownership of streetlighting and district heating (DH) systems, and establishing legal mechanisms to guarantee that municipalities can retain and re-invest the savings made as a result of energy efficiency investments are among the recommendations.

Introduction

Looking at energy efficiency at a municipal level can be justified by at least two major considerations. Firstly, energy efficiency is increasingly recognised as an alternative energy resource. Secondly, energy efficiency improvement is by nature a decentralized activity, so municipalities have an essential role to play in ensuring appropriate conditions and applying measures for energy efficiency improvements (Laponche *et al.* 1997). However, in some countries the discretionary powers of local governments have been constrained. Some powers have been taken away from local governments and those remaining to them have become subject to tighter controls: for example central government calculates what it considers each local government should spend on individual services and limits its revenue resources accordingly (Bailey 1999).

The aim of the present study is to explore those barriers to the improvement of energy efficiency at a municipal level that are rooted in the current competencies and financial sources of local authorities in Bulgaria, Macedonia and Hungary.

The comparison of the three countries in transition illustrates three different patterns of municipal involvement in energy efficiency. At one end of the spectrum depicting the municipal motivation to deal with energy efficiency interventions are the Hungarian local authorities, which have

* the author's contribution is for the Macedonian perspective

been assigned clear energy-related tasks and, as a result, have a good history of successful cooperation with ESCOs. At the other end are Macedonian municipalities, which, due to the recent start of local government reform, still have no clearly defined tasks, in particular energy related, and no sufficient stable sources of revenue to exercise these. Bulgarian municipalities are located somewhere in-between, since they have well-defined tasks, though a major energy-related duty such as ownership of district heating (DH) sources and distribution systems does not fall within municipal responsibilities, which suggests little chance for ESCOs.

Due to the limited scope of the paper we leave out macroeconomic barriers – national level energy policies and frameworks, macroeconomic conditions, the institutional framework dealing with energy efficiency and energy tariffs and subsidies – and focus only on those barriers to energy efficiency at a municipal level directly related to the current state of local self-government in terms of discretionary powers of local governments and the financial sources to exercise these. In section one we give an overview of and compare those discretionary powers of municipal authorities in each of the three countries associated with energy tasks. In section two we review municipal budgets and assess the availability of other financing mechanisms for municipalities to implement energy efficiency improvements. In section three we summarise our findings and give recommendations for improvement of conditions at local level that will facilitate the implementation of projects for energy efficiency by municipal authorities in each of the three countries. We recognise the importance of capacity building aimed at teaching municipal employees to understand the cost-efficient opportunities for energy efficiency interventions and the basic principles of financing these, but leave out the issue again due to space constraints.

Energy efficiency interventions can be categorised in three large groups (EGI 2002):

- No or low cost interventions (behavioural change);
- Retrofit type interventions; and
- Investment type interventions.

This paper deals with the last two types of interventions, since major energy savings are achieved through upgrade of the infrastructure that falls under these two groups of measures. Furthermore, it is for such type of measures that municipal authorities have to secure financing either from their own revenue or through private partnerships.

Bodies of local government in Bulgaria, Macedonia and Hungary: discretionary powers, energy tasks and financial resources to exercise these powers

A number of factors determine the motivation of local authorities to implement measures for energy efficiency interventions.

- *Ownership:* Local authorities will only dedicate efforts and financial resource in public spheres for which they have been assigned responsibilities and clearly defined tasks. When the law clearly states that municipalities own municipal buildings, district heating systems and streetlighting, they will have an incentive to improve those facilities. If the national government has control, or if the ownership/responsibility is not clear, little or no investment will occur;
- *Municipal financing:* a significant factor is the ability to raise money, particularly from non-budgetary sources like bank loans, municipal bonds, and third-party financing;
- *Motivation and other incentives*: the motivation of local authorities to improve energy efficiency and the motivation of employees in municipal institutions to actively participate in any projects of this kind are related to the benefits they gain. A powerful driver is reducing the burden that high energy bills put on the municipal budget. Increased comfort and technical upgrade of the systems are other motivating forces. Retaining the savings, where they have been generated (in the municipal budget or in the budget of the particular institution), is a key issue to look at. Understanding of the principles of and the benefits from the innovative instruments of financing is required for successful co-operation between municipalities and ESCOs.

DISCRETIONARY POWERS OF MUNICIPALITIES ASSOCIATED WITH ENERGY-RELATED TASKS

While the discretionary powers and the specific tasks of Bulgarian, Macedonian and Hungarian municipalities are still somewhat different in scope, the bodies of local government and their general competencies are quite similar. Elected council bodies are the highest decision-making organisations in local governments in the three countries that fall within the scope of this study. Mayors (elected directly) represent the executive organ and also carry out delegated state tasks.

Municipalities are responsible for and make expenditure in a number of public spheres. Comparing functions of the local governments in different countries, however, is a difficult job: looking at the general functions can be dangerously misleading since it provides little information about the precise tasks inherent in specific functions (Baldersheim *et al.* 1996). It is not within the scope of this paper to review *all* municipal responsibilities. Rather, the paper focuses on tasks of municipal authorities that are important from the perspective of energy efficiency improvements, namely responsibilities in spheres that involve high energy consumption:

- operation of municipal institutions (schools, nurseries, kindergartens, welfare and healthcare facilities, some office buildings, museums etc.)[1];

1. The operation of municipal institutions generally includes energy supply (health care institutions can make an exception, since – as is in Hungary - the municipality may be the owner, but the running costs may be paid for by the central health insurance office). The emphasis is put on these spheres since municipal ownership and operation means that the energy bills of institutions are paid from the municipal budget, *i.e.* there is a clear incentive for local governments to act for energy efficiency improvements.

- ownership and operation of district heating (DH) systems[2];
- ownership and operation of streetlighting;
- urban planning (this being related to the powers of municipal administration to impose energy efficiency requirements when approving architecture projects and issuing construction permits).

Bulgaria

The structure of municipal expenditure reflects the responsibilities of local authorities, which in turn are closely related to the motivation of local governments to implement energy efficiency. Average data on the expenditure of the 266 Bulgarian municipalities for 2001 reveals that the biggest share is dedicated to expenses in the sphere of education (35%), social welfare (18%), residential and communal services, including streetlighting (16%) and health care (10%) (Ivanov *et al.* 2002).

In the sphere of ***education*** Bulgarian municipalities have financial obligations for paying all capital and current expenditure of kindergartens, primary and secondary schools (except for some technical and vocational schools of which there are approximately 700 in the whole country: these are directly controlled by the Ministry of Education and Science) (EnEffect 2002a). The municipal authorities are interested in making investments in energy efficiency improvements in schools and kindergartens, regardless of their uncertain influence over school management (since it is the Ministry that appoints school principals and sets the salaries of teachers thus keeping control over the management of schools). High energy consumption – mainly due to inefficient heating and lighting practices – and huge energy losses because of the old building stock and the poor thermo-insulation of the buildings are characteristic features of educational institutions in Bulgaria. In practice energy efficiency improvements in schools and kindergartens have short payback times, significantly reducing the utility bills of these institutions and thus municipal expenditure (Doukov pers. comm.). This is why energy efficiency projects in schools are usually among the first attempts made by municipal authorities to reduce energy consumption.

A major concern is that the employees in municipal institutions are often not motivated enough to make energy savings since municipal institutions cannot retain and re-invest the financial savings that they make as a result of an efficient and rational use of energy sources (Doukov pers. comm.). The money saved goes back to the municipal budget and it is up to the municipal council to decide how and where to re-invest it.

The municipal tasks in the sphere of ***health care*** have decreased with the start of the health care reform in mid 1999 (Ivanov *et al.* 2002). Now health care institutions for pre-hospital treatment (polyclinics, tertiary health care, etc.) are financed through the National Health Insurance Office. Since the beginning of 2001 big regional hospitals (roughly 20 in the whole country) and homes for orphans are also financed by the National Health Insurance Office. However, with the exception of big regional hospitals, municipalities still are the majority owners of hospitals paying running costs and investment expenses (the National Health Insurance Office provides only partial financing for some municipal hospitals). Thus, especially in the case of small and medium municipalities, inefficient energy consumption practices in hospitals still create a huge financial burden (Doukov pers. comm.).

In the sphere of ***urban planning*** municipal administrations have the authority to approve architecture projects and issue construction permits. The standards for thermo-technical efficiency of buildings are a part of individual architecture plans and are set by an ordinance of the Council of Ministers (Doukov pers. comm.). Yet these energy efficiency requirements are quite basic and prevent only major heat losses in new buildings. Besides, it is widely accepted practice that architects and entrepreneurs only observe the minimum requirements.

All Bulgarian ***district heating*** (DH) companies are state-owned except for the one in Sofia (where the municipality owns the DH heat sources – heating and/or power plants, boiler houses – and the distribution system). Due to the obsolete equipment and the worn out devices, the efficiency of the production, transmission and distribution systems in DH is rather low. An independent regulatory body – the State Regulatory Commission on Energy – is responsible for the state control in the energy sector and, since the beginning of 2002, is also responsible for pricing in the energy sector (MUNEE 2001a). The heating price for households is fixed; DH companies receive subsidies from the state budget. Annual price increase of 10% is envisaged in the period 2002-2005 with the ultimate aim being the removal of the direct state subsidies at the end of the period.

Municipalities not being the owners of DH infrastructure, their energy-related duties are significantly smaller than the energy-related duties of Hungarian municipalities (see the section about Hungary). Since DH companies have significant annual energy costs and usually offer large enough projects to be attractive to ESCOs, lack of municipal ownership over DH is one of the main reasons why the chances for ESCOs in the municipal field in Bulgaria are also much smaller (EGI 2002).

In Bulgaria the issue of the ***ownership of streetlighting*** systems is rather complicated. Municipalities are responsible for "providing effective artificial lighting of public areas, including streetlighting" (EnEffect 2002b). The Law on Energy and Energy Efficiency from July 1999 has classified low-voltage electricity systems and the utility nature of streetlighting systems as municipal property. Nevertheless streetlighting systems later have been included in the capi-

2. Due to space constraints, this paper will not discuss energy use in **water systems**, although they also have high energy consumption. The organisation and management structures are rather mixed in the three countries. Only in Macedonia are water and wastewater utilities organised as municipal departments (Skopje is an exception). In Hungary cities manage their own water systems with the following ownership structures currently present (1) five regional water companies controlled by the Government; (2) joint ownership of one or more municipalities over the water supply an waste water treatment facilities; or (3) partially privatized municipal ownership. Similarly in Bulgaria there are 29 regional water and sewage companies under the Ministry of the Regional Develpoment and Construction and 14 municipal water and sewage companies (these last ones serving 15 % of the population).

tal of the new regional power distribution companies, established after the dismantling of the national electricity company, NEK (MUNEE 2001). As a result municipalities are responsible for providing the public service of streetlighting, but the regional distribution companies are the true owners of the streetlighting systems. In practice, municipalities own only those streetlighting systems which are attached on the trolley bus wires.

However, the electricity bills of the streetlighting systems are paid from the municipal budgets. These expenses are so high that most of the municipalities have constantly growing debts to the power distribution companies: in 2001 the distribution companies collected from municipalities on the average only 66% of the streetlighting electricity payments (DKER 2002). To settle this confusing situation the draft law for amendment of the Law on Energy and Energy Efficiency explicitly defines municipalities as owners of streetlighting systems. It envisages that the regional power distribution companies should transfer to the municipalities the ownership rights over the networks and the equipment for lighting of outdoor areas for common public use (MUNEE 2001). Thus municipalities would be motivated to maintain efficiently the streetlighting systems, which would decrease their expenditure. Furthermore, electricity savings would benefit not only municipal expenditure, but would produce a positive effect on the environment and on the social climate (EnEffect 2002b).

Recently another hot issue related to streetlighting systems was improved – special electricity tariffs for public outdoor illumination were re-introduced as of 1st October 2002. Until 1991 there was a special electricity tariff for streetlighting; afterwards streetlighting were included in the category of industrial and commercial consumers. This was unreasonable, because streetlighting consumes electricity for the public benefit, not for any commercial purpose; besides this streetlighting systems have a predictable consumption around the year (EnEffect 2002b). The re-establishment of the special reduced tariff, however, is a fiscal measure to reduce municipal expenses for streetlighting rather than one that promotes energy efficiency. It even discourages municipalities from installing two-scale electricity meters for streetlighting systems (a mathematical model developed by the Centre for Energy Efficiency EnEffect has shown that it is more cost-efficient for municipalities to use the reduced one-scale tariff for public outdoor illumination, than to install two-scale meters and be included in the category of industrial and commercial consumers) (Doukov pers. comm). Moreover the electricity tariff for public outdoor illumination does *not* include maintenance costs, which – from the ESCO perspective – makes projects for the upgrade of the streetlighting systems difficult to pay back (Zselev pers. comm.).

Macedonia

In Macedonia local government reform only started recently. There are high expectations concerning the Law on Local Self-Government (LLSG) adopted in January 2002. Article 22 of this law regulates the new responsibilities of the 124 Macedonian municipalities, giving them increased competencies in the following public spheres that, based on experience in other countries, include energy-related tasks: education, health care, urban planning, communal activities and social welfare. In accordance with the new LLSG Macedonian municipalities will be responsible for establishing, financing and managing primary schools. The status of secondary education is still obscure: there are different suggestions as to how to regulate the responsibilities for foundation and financing of secondary schools. It is possible that secondary education will remain the responsibility of central government. Under the new law, municipalities are also made responsible for the governance of primary health care. The LLSG, however, is only a *framework law*, its provisions are *not yet functioning* and the responsibilities of local governments are not yet clearly defined. Accomplishment of decentralisation is planned in phases and it is expected that first those responsibilities that do not require financial back-up will be devolved (for instance, appointing of headmasters of schools will soon be transferred at a municipal level) (Ymeri pers. com.).

The new LLSG will start to function and municipalities will recognize their newly acquired responsibilities only when the mechanisms for exercising these tasks are defined through the amendments which need to be made to about 70 to 80 existing laws. Among the laws to be changed with regard to the above mentioned new responsibilities are key sectoral acts, such as the Law on Education, the Law on Health Care, the Law on Spatial and Urban Planning and the Law on Public Works (Ymeri pers. comm.). The LLSG will really begin to apply when municipalities' financial resources are regulated in the future by the law on municipal finances. This law most probably will only be passed after the adoption of the Law on territorial division, which is still in preparation (the expected number of the new units of local self-government is about 80; these will be bigger and much more financially powerful than the present 124 municipalities).

Hence, at present the bodies of the central government still exercise the main tasks assigned to local authorities by the new LLSG. The Ministry of education still owns and operates the ***educational institutions;*** the Ministry of health care owns hospitals and other health care institutions and finances them through the Healthcare Fund. Thus it is the central government, rather than local authorities, that pays the running costs, including the energy bills, of educational and health care institutions. It is important to note that there are few, if any, municipal energy efficiency projects happen in these buildings, in large part because the cities have no ownership or managerial role over these facilities.

The main authority in ***urban planning*** related to issuing construction permits and thus exercising control over the energy efficiency requirements of new buildings, is not the chief architect of the town, but the local branch of the Ministry of Transport and Telecommunications. The chief architect of the town only does the detailed urban plan, while its implementation - in terms of issuing of building permits and building inspections - is controlled by the Ministry. The expectations are that by July 2003 urban planing will be transferred to local level (Ymeri pers. com.). This situation reveals a rather high level of centralisation and traditionally local responsibilities and tasks (including, but not limited to energy-related ones) still not being devolved from national ministries to local governments.

There are five ***district heating*** (DH) systems in Macedonia, providing heat to households: three are located in Skopje, one in Makedonska Kamenica and one in Bitola. The DH company "Toplifikacija – Skopje" is completely privatized and its shares are on the stock exchange. The DH heat sources are private; the DH distribution system is mostly in the ownership of the City of Skopje. "Toplifikacija – Bitola" is completely owned by the municipality of Bitola. Currently, the government regulates the prices of all energy sources in accordance with the Energy Law and the Methodology for Defining the Energy Prices (which is strongly interrelated with the market price of crude oil; thus the prices of heating and fuel for cars are updated every 2 weeks). The heating price defined by the DH Company in Skopje is a real market price, ensuring profit and dividend for its shareholders. Only the DH system in Makedonska Kamenica is not working profitably, because of bad plant design, and other circumstances (quality of the solid fuel, payments of the bills, high unemployment among the consumers, decreasing living standard and so on). In December 2002 an amendment was made in the Energy Law, according to which an independent regulatory commission will be established to set the prices of energy sources.

In Macedonia the municipalities own the ***streetlighting systems.*** The electricity bills for streetlighting are paid under the following scheme. A monthly fee that equals the residential price of approximately 15 kWh is added onto each consumer's electricity bill. The revenue from this flat monthly rate goes to the vertically-integrated power company ESM and is re-distributed among municipalities in accordance with their size and number of residents. Each municipality then pays its streetlighting electricity consumption to the local distribution branch of ESM. This system of payment, however, has a number of drawbacks. First, quite often the re-distribution and transfers are delayed. Second, under this payment method municipalities do not pay for the electricity bills of streetlighting from their own budgets. Hence there is *no incentive* to improve the energy efficiency of streetlighting systems as local authorities in many other countries have done.

Hungary

Local self-government exists at two tiers in Hungary: local and regional level, represented respectively by the municipality and the county. The 3 177 Hungarian self-governments include 19 counties and 24 administrative units within the City of Budapest. Municipalities are the basic units of the system and are organized by settlements. There are no hierarchical relations between the two types of local self-government: county governments are not 'superior' to the municipal governments. Thus, for instance, they have no right to approve decisions made by municipal governments (in respect of their budgets) and they do not have a re-allocating role in respect of state subsidies or shared revenues (the only exception is the Budapest Municipal Council). County governments have the same status as municipal governments; the difference lies in the performance of the mandatory tasks prescribed for them by the Local Government Act (LGA) (OECD 2001).

Local government tasks are categorized as obligatory or optional. Obligatory functions and powers of local governments are determined by the parliament, which simultaneously must ensure the financial means for the fulfillment of these tasks. Obligatory tasks that are important from the perspective of energy efficiency include the provision of drinking water (see the footnote # 2), kindergarten education, primary school instruction and education, basic health and welfare services, and public lighting. Among the mandatory responsibilities of county governments, which include energy-related duties, are the operation of secondary and vocational schools, teaching of children with disabilities and under permanent health care at health institutions, specialized health care services outside the range of basic health services. The LGA prescribes these as mandatory duties for county governments, but *does not exclude* the performance of such tasks – on a voluntary basis – by municipal governments as well (OECD 2001). This applies typically to the operation of secondary education institutions, health and social welfare institutions (these are areas of primary importance in relation to the potential for energy efficiency improvements).

Thus, municipal governments have obligatory responsibilities related to the operation of municipal ***educational institutions*** – kindergartens and primary schools, as well as optional responsibilities in secondary educational institutions. Municipal authorities usually undertake the tasks in secondary education because they have inherited the ownership of the institutions operated by the former councils that existed before 1990 (OECD 2001). The operation of educational and other municipal institutions includes the energy supply.

In the sphere of ***health care*** local authorities have obligations in pre-hospital care and also hospitals (under the responsibility of county authorities, but also often undertaken mandatory by municipal authorities for the above-mentioned reason). Hospitals, however, have a special status: while the municipality is the owner, the running costs – including energy bills – are paid for by the central social security fund (EGI 2002). Reconstruction and buying of new equipment, on the other hand, fall within the duties of the local government. Many projects have been implemented in hospitals: 'French type' ESCOs are especially active, since hospital authorities are eager to outsource their energy supply.

In the sphere of ***urban planning*** municipal administrations have the authority to approve architecture projects and issue construction permits.

There are a little more than 100 ***district heating*** (DH) systems in Hungary. The LGA and its amendments transferred the ownership of DH assets to the municipalities and assigned the duty of "participating in local energy supply" to them. Thus, after the privatization of power and gas distribution, DH remained the only part of the energy infrastructure whose owner is the municipality (even though many DH companies have also been privatized). This ownership has made the cooperation between municipal authorities and ESCOs necessary and attractive for both sides (Kovacics pers. comm.). In the early 90s the ESCO market started with trade of energy efficiency equipment, installation companies and private energy auditing companies; at that time the most attractive type of municipal projects were for DH fuel switching (EGI 2002). Now, these types of projects are largely over, so the ESCOs adjusted to the new conditions (see page 11).

Table 1. Who is the owner? Who pays the energy bills?

Country	Educational institutions	Hospitals	Streetlighting	District heating
Hungary[3]	Cities	Energy bills paid from the Central social security fund; Reconstruction financed by the local governments; Cooperation with French type ESCOs sought after since hospitals are eager to outsource their energy supply.	The power utility owns the streetlighting systems; Electricity consumption and maintenance paid by the local government.	The city is the owner and sets the tariffs.
Bulgaria	Cities	Municipalities are still the majority owners of hospitals, paying all running and investment expenditures. Only the big regional hospitals are financed by the National Health Insurance Office;	The power utility owns the streetlighting systems; Electricity consumption and maintenance paid by the local government.	Central government is the owner, except for Sofia.
Macedonia	Ministry	Ministry	N/A	Skopje – private; National government controls the tariffs

Unlike in Bulgaria and Macedonia, Hungarian municipal authorities not only provide DH, they also **set the prices for district heating**. Local authorities tend to keep these prices low for social reasons, which leads to limited investment in infrastructure upgrade. Furthermore, tariffs not covering the cost of energy services provided by cities affect the creditworthiness of local authorities when it comes to borrowing and cooperation with ESCOs (EGI 2002). However, local authorities can incorporate investment costs in DH fees, or reset the structure of the DH fee. Currently, DH fees include approx. 50% fixed costs. Practice shows that if municipal authorities reduce the share of fixed costs (let's say to 10%), this results in a significant increase in the attractiveness of energy efficiency improvements (Kovacics pers. com.).

Like in Bulgaria, the local power utility company is the owner of the ***streetlighting*** infrastructure, but providing streetlighting and maintaining the systems are municipal duties (EGI 2002). Local authorities pay the electricity consumption of streetlighting and are therefore interested in improving its efficiency. There is a special tariff for electricity consumption that includes maintenance costs. Unlike in Bulgaria and Macedonia, municipal authorities cannot leave the streetlighting bills unpaid (and therefore there is not threat of disconnection) (Zselev pers. comm.).

Average data on municipal expenditure in Hungary for 1999 reveals that the biggest share is dedicated to expenses in the sphere of education (33% of the total current spending of local governments), health care (19%), social welfare (16%) and communal sevices (6%) (OECD 2001).

Conclusion

In this section the main responsibilities of municipal authorities that are relevant from the point of view of energy efficiency were outlined. It was discussed to what extent local authorities in each of the three countries are assigned energy-related tasks. Bulgarian and Hungarian municipalities are responsible for the operation of municipal institutions (nurseries, kindergartens, primary and secondary schools, museums, some administrative buildings, etc). In both countries, due to health care reforms, health care institutions have a special status. In Bulgaria and Hungary the urban planning authority is at the local level. In all these fields – education, health care and urban planning – Macedonia is still an exception, since despite the provisions of the new LLSG all these functions are still centralized. Streetlighting systems in Bulgaria and Hungary are property of the utilities (with intentions to be transferred to local governments); Macedonian municipalities own the streetlighting systems, but the current method of consumption payment provides no incentive for them to improve the efficiency. Finally, DH ownership and operation is the sector where most municipal energy-related tasks appear and where the differences between the three countries are the biggest. Bulgarian municipalities do not have any responsibilities related to DH: all systems (except for that in Sofia) are state-owned. Macedonian municipalities have responsibilities in DH (in Skopje the distribution network is municipal property, while in Bitola the whole DH company is municipal), but heating fees are controlled by the government. Finally, Hungarian municipalities own and have the task to operate the DH systems and set the prices, which has resulted in extensive cooperation with ESCOs. The comparative table below summarizes the main findings of this section.

ELEMENTS OF LOCAL GOVERNMENT FINANCE

The decision of local governments whether to make energy efficiency improvements is not only grounded in their discretionary powers. Another important factor is the ability to raise money, particularly from non-budgetary sources like bank loans, municipal bonds, third-party financing. As EGI (2002) describes it, there is the traditional method of implementing energy efficiency interventions where money comes from the budget of the municipality or from the budget of the individual institutions. For well-known budgetary constraints, the traditional method does not work well for energy efficiency improvements[3] and as a consequence oth-

3. Besides, often energy efficiency projects – that bring reduction on running costs – are not distinguished from other types of investment projects when 'competing' for scarce budgetary resource.

er financing instruments and public private partnerships are needed, such as flexible financing schemes and cooperation with ESCOs. Nevertheless, first we look at the municipal budgetary revenue since the stability and predictability of these revenues is crucial for the creditworthiness of municipalities and thus for their ability to borrow. Municipal revenue in Bulgaria, Macedonia and Hungary largely depend on central resources (shared revenues and subsidies).

Local taxes, fees and state subsidies

In Hungary and Bulgaria the redistribution of the so-called ***shared taxes*** is done by the central government, while at present in Macedonia a system of sharing taxes between central and local governments still does not exist (it will be established by the law on municipal financing that is currently under preparation). Personal income tax, taxes on acquisition of property, and value added tax (this last is not shared in any of the three countries discussed in this paper) are often shared between the central and local governments in such a way that central government sets the level of the tax and the rate of re-distribution, allocating part of the tax revenue to the local governments. If the system of redistribution of shared taxes is frequently changed (as is done in Bulgaria), this may make a large source of municipal revenue rather *uncertain* and *hard to plan*. In the period 1993-2000 shared taxes accounted for approx. 12% of the average municipal revenue in Hungary (Hungarian Ministry of Finance 2001), and about 40% of the average municipal revenue in Bulgaria (Ivanov *et al.* 2002), the variance between these numbers showing the relatively higher level of centralization of Bulgarian municipalities.

In Bulgaria the central government sets the ranges within which the local government can define the rates of ***local taxes***; municipalities are responsible only for the collection of non-tax revenue (*i.e.* local fees), while all tax revenue is collected and administered by the state tax authorities (Doukov pers. comm.). In Macedonia the maximum rates of local taxes are set by the central government and all taxes are collected by the state Public Revenue Office. In this sense, the 'local' nature of these taxes implies only that they have been obtained exclusively by the units of local self-government. The representative bodies of Hungarian local governments may, within their area of jurisdiction, *introduce* local taxes by a decree. Rates are defined within a range set by the central government with the notable exception of the local business tax (corporate tax) which accounts for a huge share (80%) of local tax revenue: local authorities are completely free to set the rate of this tax and to define the companies that are exempt from it (this last practice is expected to be abolished in 2003 in order to comply with EU competition policy). In Hungary the notary within the mayor's office collects local and shared taxes (Nagy pers. com.). All these facts support the statement that Hungarian local authorities have much more freedom to manage and control their revenues than their Bulgarian and especially Macedonian counterparts.

Bulgarian and Macedonian municipalities, and to a lesser extent Hungarian local governments as well, are largely dependent on ***subsidies*** from the central government. For example, in 2000 Bulgarian municipalities received on average around 37% of their revenues from state subsidies; in the period 1993-2000 Hungarian municipalities received around 33% of their revenues from state subsidy. General (or normative) subsidies constitute a big share of state subsidies in Bulgaria and Hungary – respectively around 80% and around 70%. Current municipal expenditure is financed from general subsidies; municipalities have the right to dispose of the general subsidy revenue independently. In Macedonia subsidies are earmarked for certain programs, or should be used for operating costs of the municipal administration in the case of re-distribution of funds under the Law on Limiting the Sources of Revenue for Financing Public Needs (see below). General subsidies are usually calculated by formulas that take into account various indicators of resident population, education, health care and social welfare. Heavy dependence on state subsidies and shared taxes coupled with frequent changes in the municipal revenue sources decreases the creditworthiness of municipalities and affects negatively the ability of local authorities to borrow and to work with ESCOs. Furthermore, financial dependence gives tools for central government to 'reward' or 'punish' local governments.

One major deficiency of the current methodology for general subsidy allocation in Bulgaria affects directly the motivation of local governments to make energy efficiency improvements. It concerns municipal cost reduction: if there is a reduction in municipal expenditure, the methodology fails to point out what activities have contributed to it (EnEffect 2002a). Instead of identifying the reasons for any expenditure reduction, the methodology works straight in the direction of a curtailment of subsidies for the next year. This reduces the motivation of local authorities to seek ways to cut down their expenses and therefore diminishes their interest in implementing energy efficiency improvements, makes municipal revenue planing difficult and inhibits the co-operation between ESCOs and municipalities. Thus, a major barrier in Bulgaria is the lack of any legal mechanism that allows municipalities to keep the savings made as a result of energy efficiency improvements; indeed such improvements often have as an outcome subsidy curtailment (EnEffect 2002a). This deficiency has not been observed in the other two countries. In Hungary, if an ESCO contract is signed, the energy costs are included in the operational costs and budgeted for the next year (Rozsa pers. comm).

Furthermore, in the case of both Bulgaria and Macedonia, the methodology for subsidy allocation is amended almost every year (very often subsidy allocation depends on political prominence of the municipality). This makes long-term revenue planning difficult and reduces the creditworthiness of municipal authorities.

Table 2 summarises the sources of sub-national revenue in the three countries.

Special attention is also to be paid to the fact that currently in Macedonia there is no separate "local self-government finance law". There does not appear to be a single consolidated budget at the local level. It is anticipated that the law on municipal financing will only be passed after the adoption of the Law on territorial division, which is still in preparation. Furthermore, in Macedonia the central government still keeps control over the municipalities' own revenue through the annual Law on Limiting the Sources of Reve-

Table 2. Sub-national revenue in Bulgaria, Hungary and Macedonia.

	Bulgaria	Hungary	Macedonia
Own local taxes	Law on local taxes and fees determines the ranges withing which these should fall: – Real estate taxes; – Inheritance taxes; – Gift taxes; – Vehicles taxes.	Local governments decide on the rate of: – Local business tax (*approximately 80% of the local tax revenue*). Law on local taxes determines the ranges withing which these should fall: – Building tax; – Land tax; – Communal tax payable by individuals and businesses; – Tourism tax.	The maximum rates set by the central government – Urban tax; – Property tax; – Inheritance tax; – Gift tax; – Right transaction tax.
Shared taxes	Rates of re-distribution set by the central government – Personal income tax (recently 100% allocated to the local governments, however used for horizontal equalization); – Excises levied on natural persons, producing wine and the strong drink rakia.	Rates of re-distribution set by the central government – Personal Income Tax (40%); – Duties on acquisition of property; – Tax on motor vehicles (set within a range established by the law. The revenue up to the minimum rate is distributed between the central and the local government, the revenue resulting from the difference above this minimum is acquired by the local authority).	No system of sharing taxes between central and local governments
Non-tax revenue (fees and charges only reviewed)	– Local fees, set by the municipality (**only** the municipal waste fee). – Local fees, set by the municipality in accordance with minimum and maximum values defined by law (majority of fees); – Local fees, the level of which is defined by law (fees for administrative services).	Central government sets the upper ceiling of fees.	Rates set by the central government – Land fee – Communal fees
General purpose subsidies	Around 80% of all the total state subsidy. Unrestricted utilization.	Normative state contributions (around 80% of the total grants). Unrestricted utilisation.	
Specific subsidies	– Target subsidies for unemployment payments; – Target subsidies for capital expenditure; – Ad-hoc subsidies.	– State contributions for specific purposes allocated under normative rules – Earmarked specific state subsidies granted on a case-by-case basis for specific purposes	All subsidies are earmarked for certain programs.

Sources: NAMRB 2002, OECD 2001 and Ymeri pers. comm.

nue for Financing Public Needs. In accordance with the provisions of this law, if any municipality acquires revenue beyond the limit specifically allocated to it under Article 2, the surplus goes back to the central budget and is redirected and redistributed to other municipalities, which are in financial difficulties. It is clear that this law removes any incentive for local authorities to collect more revenue, as this will be taken away from them (Ymeri pers. comm.). The expectations are that in the first phase of decentralisation these revenue caps will be eliminated, municipalities will be allowed to administer municipal taxes, fees and local charges, and to set the property taxes within a range. It is also expected that a more stable revenue base for municipalities will be created by using the inheritance and property tax to create a municipal equalisation fund (Ymeri pers. com.).

Municipal assets and revenue from managing municipal property

In all the three countries municipalities can acquire revenue by managing municipal property: it can be let, sold, exchanged, given for concession, used as a bank guarantee, etc. In this section we look primarily at municipal property as a source for bank guarantees.

In Bulgaria privatisation deprived municipalities of property and facilities with high market values and attractiveness. Nevertheless it is a common practice for municipal authorities to guarantee bank loans with municipal property (Doukov pers. comm.).

Hungarian municipalities own real estate and movable property which they may manage at their full discretion. There are two types of limitations (1) the assets of public nature are non-marketable; and (2) certain assets are marketable only under certain conditions (such as public utilities, institutions, public buildings, ancient monuments, historical buildings and others) (OECD 2001). Besides, the assets related to the obligatory tasks of local authorities cannot be used to guarantee bank loans (Rozsa pers. comm).

In Macedonia the major problem is the ill-defined municipal ownership and property: Macedonian municipalities currently own no real estate (a few of the municipalities have a floor of some military building). Thus, another urgent issue in Macedonia is the separation of state and municipal property (Ymeri pers. comm.).

Borrowing

Because of the shortcomings of the traditional method of financing energy efficiency improvements, borrowing gains increasing importance in this sphere. The central government keeps control over municipal fiscal matters through the following tools (CUI 1999): (1) passive tools (laws prohibit over-spending) and (2) active tools (when the higher tiers prescribe an approval for borrowing). Active tools in-

clude, for instance, approval of each loan by a higher authority (applied in Macedonia). Passive control may take the forms of: (a) setting certain limits on the annual debt, e.g. the share of loans in the municipal revenues (applied in Bulgaria and Hungary, but innovative financing, such as ESCO contracts does ***not*** count against debt limits); (b) the so-called "golden rule" according to which municipalities cannot finance operating costs from loans; and (c) the central government setting specified limits on capital spending (applied in Bulgaria and Hungary). These forms of central control, however justified, often act against the interests of municipal authorities when applying for bank loans.

Bulgarian municipalities can apply for bank loans for temporary municipal budget shortages for covering operating costs, but these should be paid back by the end of the fiscal year. Municipalities can guarantee loans with mortgage of municipal property. In practice this can be difficult, because privatisation left some municipalities with little property that can be accepted by banks as collateral. Another major problem is that in the Law on Municipal Budgets there is no definition of investment credit: thus the National Audit Office requires municipalities to pay back their loans till the end of the current year. Therefore there is no distinction between long-, medium- and short-term bank loans for municipalities, which is rather impractical with regard to capital investment (Doukov pers. comm.).

Besides, 6 months before the expiry of their 4-year mandates, local authorities cannot create debt. In other words, a credit for more than 3 years can be taken only in the first few months of the mandate of the local government. Municipalities can guarantee loans against their *own* future revenue to the municipal budget (Doukov pers. comm.). This makes borrowing from commercial banks easier, but it would be even more practical if municipalities were allowed to guarantee bank loans not only with their own future revenue, but also with future budgetary revenue (Zselev pers. comm.). Bank loans cannot exceed 10% of municipality's own revenue, which so far – with the exception of Sofia – has not been a significant problem (Doukov pers. comm.). If municipalities apply for loans which create financial debts for the state towards external creditors, they also should have the approval of the Ministry of Finance (NAMRB 2002). Besides the problem with securing collateral that is adequate in terms of type, value (200%) and liquidity, the high interest rates on investment credits also discourage the development of a municipal debt market (MUNEE 2001). Nothing can be done against default payments and there has been no legal precedent for bankruptcy proceedings in Bulgaria in the municipal area (Zselev pers. comm.).

In Macedonia commercial banks have not hitherto financed any municipal projects and are still hesitant to do so since municipalities have limited sources of revenue and are considered to be risky clients.

In Hungary there is no regulation on whether a loan taken by the municipality is to be used for operating or investment purposes. The minimum collateral requirement is 100% (usually it is 120-140%), but this is not the most significant obstacle to municipal borrowing (Rozsa pers. comm.). The ceiling for annual commitments by a local government resulting in debt (borrowing, bond issues, provisions of guarantees and safety) equals 70% of the local governments' own revenue net of short-term commitments (capital repayment, interest payment and lease fees) and liabilities. Thus, Hungarian law caps municipal borrowing at 70% of the local government's net income after all expenses for "basic services" (i.e., schools, hospitals, public transit, roadways etc.) that generally comprise as much as 90% of the municipal budget. Therefore, *the borrowing limit for local authorities is in fact quite stringent* (SJAron Associates 2000). Besides, state subsidies for municipalities in a disadvantaged situation, as well as future energy savings are not considered the municipality's own income when calculating the debt limitation. Hence debt limitation creates situations where commercially attractive projects cannot be implemented – especially in medium and small municipalities. A positive sign is that ESCO contracts do not count against debt limits, since calculations are made for existing debt service and not for service payment obligations (Rozsa pers. comm).

Borrowing abroad for Hungarian municipalities is not subject to any specific restrictions. As already stated primary assets (*i.e.* the property of the local government which serves directly for carrying out of compulsory duties, or the enforcement of public rights), standard state contribution (with the exception of liquid credits), state contribution, personal income tax and revenues from the state budget for operational purposes *cannot* be used to secure loans.

Imposing limitations on annual debt is an adequate tool for fiscal control over local governments and is even among the requirements for EU accession. A key issue to observe however is that co-operation with ESCOs does not count against debt limits. Vendors and suppliers of products also may provide lease-based financing or assist the borrower in obtaining financing from certified creditors.

Co-operation with ESCOs

In Bulgaria the number of ESCOs is relatively small; typically they offer replacement of boilers, fitting of control systems and measuring devices, installations of pipelines in residential buildings and municipal institutions (MUNEE 2001). Often a lack of understanding of the basic principles of ESCO financing from the side of municipal employees turns out to be a huge barrier. Furthermore it turns out to be difficult to set up baseline conditions since quality standards for space heating and lighting are not met which naturally affects negatively the implementation of energy efficiency projects (Zselev pers. comm).

In Macedonia the ESCO market is still practically nonexistent.

The Hungarian ESCO market is rather well developed when compared to the ESCO markets of other economies in transition. ESCO activity is particularly intensive in the municipal sector, where the majority of energy efficiency investments are made by private entrepreneurs (EGI 2002). ESCO market development, and especially cooperation with municipalities, has come as a result of a long process initiated by the demand from the side of municipal authorities after they were transferred the ownership of DH systems. At present there are three broad categories of ESCOs: (1) "classic" ESCOs, (2) the "French model" ESCOs which not only develop and implement the project, but take over the operation and sell energy to the client, and (3) ESCOs set by the large utilities in order to retain their large consumers and

conquer new markets in the electricity market liberalization. This last type of ESCO is also supported by the regulatory framework: energy services, unlike energy equipment, are taxed with a reduced VAT (EGI 2002). This group of ESCOs is relatively uninterested in municipalities (large municipal institutions – such as hospitals – make an exception). However, the definition of place of consumption in the Act on Electricity as "a contiguous area supplied via *one or several* connection points where the consumer uses electricity" can put municipalities in the category of large consumers that can choose their supplier in the first stage of electricity market opening starting in the beginning of 2003. If municipalities are placed in the category of large consumers, ESCOs and suppliers will have an increased interest in cooperating with them (Kovacsics pers. comm.).

Hungarian and Bulgarian public procurement procedures require that equipment suppliers and service providers of the public sector have to be selected by an open bidding process. There must be separate bids for project design, implementation, etc. This hinder one of the key advantages offered by ESCOs, namely offering integrated energy solutions. Therefore, since in ESCO projects the subject of procurement is not clear and should be defined by the ESCO itself as part of the development of the project, there is a need to adjust the procurement to reflect this specific feature of that type of projects. A positive feature in Hungary is that procurement is based on the net present value (NPV) of the investments and often lifecycle cost analysis is taken into consideration in the selection procedures (Zselev pers. comm).

Other financial instruments related to borrowing for energy efficiency interventions

Energy efficiency is often listed among the primary goals of energy programs and strategies. However, in practice often rather limited resources are allocated to the improvement of municipal energy efficiency.

In Bulgaria in the last few years the Development Credit Authority (DCA) has provided funds for a number of energy efficiency projects. Under the contract between USAID and the United Bank of Bulgaria, USAID guarantees 50% of credits taken by municipalities or municipal companies, private industries and other Bulgarian companies (with less than 50% state share) for implementing projects for improving energy concepts. This mechanism guarantees credits for energy efficiency projects only.

In Macedonia no such financial instruments have been applied for energy efficiency projects.

In Hungary at the moment there is the Energy Efficiency Credit Program, commonly called "The German Coal Fund", which provides soft loans for the implementation of energy efficiency projects in general. Both municipalities and ESCOs can apply for the fund if the project meets some technical and economic criteria and the applicants are considered creditworthy (EGI 2002). The successful operation of this program has shown that state intervention into energy policy can be highly efficient. Another very successful initiative is "Hungary Energy Efficiency Co-financing Program" (HEECP) by the IFC/GEF, under which guarantees for banks which finance private ESCOs are provided. Four banks are currently involved: Reiffeisen Leasing, KH, OTP and HVB-Hungary.

National environmental funds

The existing environment protection funds in Bulgaria do not have energy efficiency projects among their priorities: the closure of the National Energy Efficiency Fund in 1999 deprived municipalities of an adequate funding mechanism. The National energy saving action plan till 2010 for improving energy efficiency for the final consumers stipulates that a revolving fund "Energy efficiency and renewable energy sources" should be created. Municipalities currently can apply for funds from the National Fund for Environment Protection and from the National Trust Ecofund. The former is under the Ministry of Environment and Waters and provides grants, interest-free loans, loans with preferential interest rate and covering up to 50 percent of interests on bank loans. The latter gives grants and loans (EnEffect 2002a).

The Hungarian government operates a special company to act as an energy efficiency agency. The Energy Centre (Energy Efficiency, Environment and Energy Information Agency Non-profit Company) is a national energy efficiency agency which also manages the UNDP municipal energy efficiency program, which provides funds to cover energy audits and the project development costs of municipal energy projects (EGI 2002). Within the Széchenyi Plan launched by the previous government, support could be obtained for conducting energy audits, formulating municipal energy policy and implementing renewable energy projects. Since the parliamentary elections in the spring of 2002, the Széchenyi Plan has been halted but statements have been made that some parts of it, including the energy efficiency subprogram will be continued (EGI 2002).

In Macedonia in the 80s and early 90s, there was a Fund for energy efficiency projects, which supported more than 120 projects. At present no such fund exists. The Macedonian Fund for Environment finances a wide variety of activities among which also projects related to air protection, in particular fuel switching. A lot of projects are related to energy efficiency (such as installation of boilers with high efficiency). There is an intention that in the future the Fund should start to function as an 'Eco bank', providing soft loans.

Table 3. Summary of the barriers to energy efficiency and recommendations for overcoming these.

BARRIERS	COUNTRY WHERE OCCURRING	RECOMMENDATIONS
RESPONSBILITIES AND TASKS		
Narrow scope of energy-related duties	**Bulgaria**: very limited energy-related duties: DH systems not municipal property; unclear ownership of streetlighing systems.	Transfering the ownership of streetlighting systems and DH systems to municipalities.
	Macedonia: General municipal responsibilties and particular energy-related duties are still rather limited.	Ammendments needed in the sectoral laws on education, healthcare, urban planning to fully transfer energy-related duties to local governments.
	Hungary: unclear ownership of streetlighing systems.	Transfering the ownership of streetlighting systems to municipalities.
Inability to retain savings	**Bulgaria:** both local authorities and municipal institutions.	Establishing a legal mechanism that guarantees that municipalities can keep the savings made as a result of energy efficiency improvements. For instance no subsidy curtailment of municipalities that have signed a contract with an ESCO. Introduce a mechanism to distinguish energy efficiency investments – since they generate savings - from other types of investments.
	Macedonia: N/A under the *curren*t framework of municipal financing.	
BUDGETARY ISSUES		
Large dependence on state transfers, frequent changes in municipal revenues	**Bulgaria** Municipalities cannot set the rates of local taxes and fees. The methodology for subsidy allocation is amended almost every year. Municipal own revenues are changed frequently. These create instable municipal finances.	Giving municipalities the right to set the rates of local taxes and fees (for this ammendment in the Constitution is needed…); Ensuring stable and predictable sources of revenue for municipalities;
	Macedonia No single law regulating municipal finances.	Adopting a well-designed law on municipal finances that ensures sufficient sources of revenue for municipalities to fulfil their newly assigned task; Ensuring stable and predictable sources of revenuefor municipalities;
DIFFICULT ACCESS TO NON-BUDGETARY SOURCES		
Poor municipal creditworthiness	The problem is accute in **Bulgaria**; **Macedonia**n municipalities have not borrowed sofar. Not a siginificant problem in **Hungary**	Establishing more guarantee funds/schemes to address the guarantee/collateral problem (such as the existing HEECP in Hungary and DCA in Bulgaria); Collecting credit data for municipalities. Rating agencies to evaluate the creditworthiness of municipalities.
Difficulties in ensuring proper collaterals	All the three countries, though to a different extent.	Assigning clear municipal property rights; Establihing guarantee funds/schemes to facilitate municipal borrowing; Allowing municipal authorities (in Bulgaria) to guarantee loans against future budgetary revenue.
Other dificulties in obtaining bank loans	**Bulgaria:** loan term limitations	Introduce the definition of investment credit in the Law on municipal budgets;
	Macedonia: approval needed from the Ministry of Finance	Conditions for municipal borrowing should be established by the future municipal financing law,
	Hungary: strict borrowing limits (see next)	
Debt lmitations	**Bulgaria:** not a significant problem	Re-considering these limitations in order to avoid situations of commerically attractive projects not being implemented because of debt limitations.
	Macedonia: N/A	
	Hungary: very significant problem	
Public procurement environment not supportive to ESCO projects	**Hungary** and **Bulgaria**: equipment suppliers and service providers of the public sector have to be selected by an open bidding process. *Separate* bids for project design, implementation, etc.	With ESCO projects the subject of procurement is not clear and should be defined by the ESCO itself as part of the development of the project. The procurement procedures should be made more supportive to this specific of ESCO projects.
Low baseline conditions	**Bulgaria** and **Macedonia:** standards for space heating and lighting in municipal institutions are not applied.	Priority support to return to the normal state-of-the-art the technical state of the facilities from the social sphere.
Energy efficiency fund	**Bulgaria:** no separate energy efficiency fund	Establishing a separate energy efficiency fund that can provide grants and/or soft loans to municipalities
	Macedonia: no separate energy efficiency fund	

Barriers to energy efficiency improvements arising from the current state of local self-government: summary of findings

The general weakness in the present situation of the local government finance system in all three countries can be summarised under two areas outlined by Hegedüs (1999):

1. Vague definition of local government tasks.
2. Dominance of transfers within local government revenue, unstable financial conditions, frequent changes in municipal revenue sources. Lack of credit history and low creditworthiness of municipalities (this can be explained by the still conservative bank systems). Inability to provide adequate guarantees or collateral and thus limited access to credit markets and other financing schemes and instruments.
3. Table 3 summarizes the barriers to energy efficiency at a municipal level and gives some recommendations for overcoming these.

Conclusion

In this paper we explored and compared barriers to energy efficiency at a municipal level that are rooted in the current competencies and financial sources of local authorities in Bulgaria, Macedonia and Hungary. We assessed the discretionary powers and spheres of responsibility of local authorities and concluded that Bulgarian and especially Macedonian municipalities have much more limited energy-related duties than Hungarian local governments. Since budgetary revenue as traditional sources of financing of energy efficiency interventions is often insufficient, we assessed the availability of other financing mechanisms for municipalities to implement energy efficiency improvements and summarised the constraints under the current situation in the three countries. Finally we gave recommendations for policy measures to eliminate some of the existing barriers to energy efficiency.

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