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ENERGY EFFICIENCY AS A SUSTAINABLE MANAGEMENT CHALLENGE - CASE OF SERBIA -

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Abstract

Based on the current Serbian Energy Strategy, energy efficiency (EE) has been recognized as the second priority of the economical use of quality energy products. Companies in Serbia predominantly use electricity, the most energy inefficient and expensive form of heat generation, so overspending is the consequence, resources are drained, and pollution increases. The level of importance and implementation of EE management among Serbian small and medium enterprises (SMEs) was a topic of survey conducted in December 2012. The participants rated the general level of awareness of rational energy consumption in Serbia as very low among SMEs. It is also considered that the State and the media are not making enough effort to inform the public about the importance of rational energy consumption. Regarding advisory assistance in the domain of EE the general view is that SMEs in Serbia need advisory assistance in the area of improving EE, both in legislation and administration, and in technical solutions and financing issues. Several recommendations are proposed as a means to providing more implementation of EE measures in companies in Serbia.

Keywords: ***e***nergy efficiency, sustainable management, energy management, EU energy strategy, SME competitiveness, energy advisor

1 SUSTAINABLE DEVELOPMENT AS AN OVERALL ECONOMIC AND SOCIAL POLICY IN SOUTH EAST EUROPE

Modern organizational studies have moved on from the earlier concept of disassociation from the natural environment and its implications. Attention to non-human nature was absent from the strategic management literature and confined to the field of business. Topics of sustainable development, climate change, ecosystems and biodiversity were nonexistent in leading management journals until the early 90's. Management of sustainable development is now one of the crucial segments of management theory and practice. It is the key principle on

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which countries base their economic and social development and therefore it is not a surprise that some authors have included sustainability development as one of the global megatrends and, like other megatrends, they present inexorable strategic roadmaps for corporate leaders (Lubin, 2010).

The countries making up the region of South East Europe and Serbia have all included the management of sustainable development as a formative element of their overall economic development. The development strategy of Bosnia and Hercegovina stipulates five priorities among which are Sustainable Development (Vijeće ministara BIH, 2010). Bosnia and Hercegovina focuses on agriculture and food production, energy, environment, transport and communication. Croatia, an EU member since 2013 has harmonized its regulation with the EU requirements, and created the Strategy of sustainable development in 2009, but it is also a formative element of other strategies like the Strategy of tourism development and the Strategy of regional development. Montenegro has a separate ministry dedicated to this sole purpose: the Ministry for Sustainable Development and it shows a strong policy intention to make Sustainable Development a key driver for its economy and the environment.

Serbia has ratified the United Nations Framework Convention on Climate Change and the Kyoto Protocol. It has established a Government Office for Sustainable Development for Underdeveloped Areas, and has enacted a special Law on Government which adapted an Action plan on Natural Strategy of Sustainable Development 2009-2017, in which sustainable economy and industry are the first priority.

2 THE ROLE OF ENERGY AND ENERGY EFFICIENCY IN SUSTAINABLE MANAGEMENT

Since approximately 1850, the global use of fossil fuels has increased and dominates energy supply, leading to a rapid growth in CO2 emissions. The contributions of individual anthropogenic GHGs to total emissions in 2004, expressed as CO2equivalent were greatest from fossil fuels (56.6%), deforestation and decay of biomass (17.3%) and methane (14.3%). (IPCC, Summary for Policymakers, 2011) Therefore, out of all the numerous critical factors, it is energy production and consumption that has had the most decisive impact on the sustainability on the global level. In 2007 the European Council adopted ambitious energy and climate change goals for 2020 – to reduce greenhouse gas emissions by 20%, to increase the share of renewable energy to 20% and to make a 20% improvement in EE. The energy strategy of EU rests on the goals proclaimed to be reached in 2020. EE is expected to deliver 20% energy savings by 2020 and 30% to 40% energy savings by 2050. At the current rate of progress, only half of the anticipated 20% energy savings coming from EE will be achieved by 2020. The overall percentage of primary energy consumption savings for the EU-27 in 2010 due to EE measures was 5.44%. This is of great concern as EE is crucial in energy policy in order to achieve international competitiveness and security of supplies, and to avoid further major investments in electricity generation. (Heffner, 2012)

In the EU according to Eurostat data, on average the final end use of energy shows three dominant categories: transport (31.7%), households (26.7%) and industry (25.3%). Today, industry accounts for about one-third of total global energy use. The industrial sector is responsible for about 22% of worldwide CO_2 emissions, of which 26% is from the iron and steel industry, 25% from non-metallic minerals and 18% from petrochemicals (Energy Technology Perspectives: Scenarios & Strategies to 2050, International Energy Agency Fact Sheet, Industry).

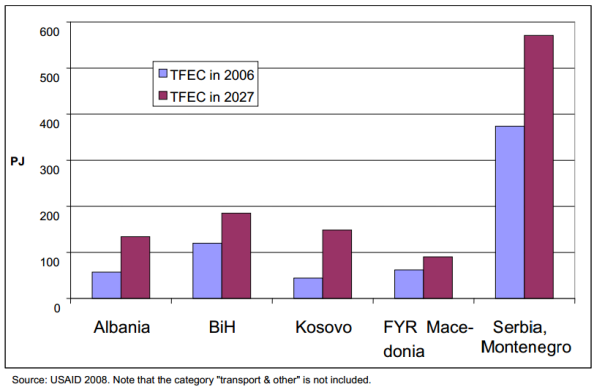
EE is a way of managing and restraining the growth in energy consumption. The International Energy Agency classifies something to be more energy efficient if it delivers more services for the same energy input, or the same services for less energy input (International Energy Agency definition).

The EU Directive 2006/32/EC defines energy efficiency as "a ratio between an output of performance, service, goods or energy, and an input of energy" (Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006). EE offers a powerful and cost-effective tool for achieving a sustainable energy future. It is an instrument for achieving a sustainable future of countries, regions, cities and individual companies and is also the limitless source of renewable energy.

The Introduction of EE management in industry and small and medium size enterprises (SMEs) has and continues to reduce the need for investment in energy infrastructure, cuts energy bills, improves health, increases economic and business competitiveness all by cutting energy costs and improving consumer welfare.

3 ENERGY EFFICIENCY IN SERBIA

Serbia has become a member of Energy Community of South East Europe. The European Commission established the Energy Community in 2005 which included the nine Contracting Parties from South East Europe. One of the tasks of the Energy Community is to organize the relations between the countries and create a legal and economic framework improving the environmental situation in relation to Network Energy and related EE, and fostering the use of renewable energy. The Energy Law (2005) and the Law on Efficient Use of Energy (2012) of Serbia are harmonized with the EU directives. In the scope of the current Serbian Energy Strategy, EE has been recognized as the second priority of the economical use of quality energy products. Its goal is also to increase the EE in all of the segments of the energy lifecycle: production, distribution and utilization by the end user of all energy-related services. Although there is a detailed Energy Sector Development Strategy, the ordinances and regulations required for the implementation of the Energy Law in individual economic sectors are not yet in place.



Graph 1 Total final energy consumption projections to 2027 in the Western Balkan region Source: USAID (2008)

The energy intensity of 1.61 toe/1000$$_{2000}$$ (calculated as the market exchange ratio) in Serbia is the second highest in Europe and the third highest calculated as purchasing power parities (Rajaković & Bjelić, 2012). Industry in Serbia uses 34% of final energy consumption. The low energy intensity requires a substantial improvement since many of the measures have not yet been applied. Companies in Serbia predominantly use electricity, the most energy inefficient and expensive form of heat generation.

Buildings supplied with distance heating generally have no heat meters, the heating technology used is often outdated and the thermal insulation of industrial buildings is poor. The thermal energy dissipation can be illustrated by the energy consumption in buildings where Serbia is the top spender solely due to low insulation in residential properties (apartments and houses). The consumption is about 250 kW/m^2 per year (National Typology of residential Buildings in Serbia, 2012, p. 255); whilst as a benchmark we can note that in Austria it is 120 kW/m^2 with the aim of reaching 70kW/m^2. Therefore overspending is the consequence, resources are drained, and pollution increases. It hurts all of the participants in the cycle, and it endangers the competitiveness of the companies. So, it is important to stress that energy management is very much needed as a driver for environmental management and overall operations performance management (Morvay & Gvozdenac, 2008, p. 55).

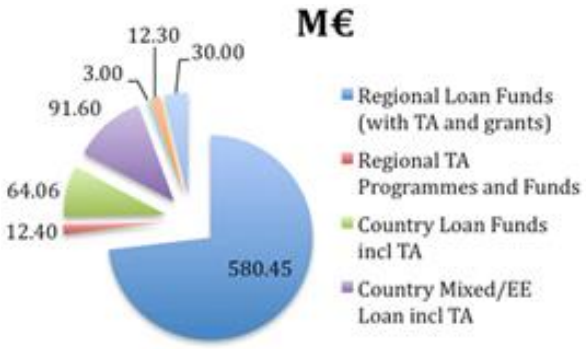
4 THE CHALLENGES OF ENERGY EFFICIENCY MEASURES IMPLEMENTING IN SERBIA

It is not the lack of adequate legal or economic framework which poses the greatest obstacle to management of EE being introduced. The UN Economic Commission for Europe has concluded that two major factors contribute to the lower level implementation of EE management in Serbia and the Western Balkans region: lack of information and more competitive funding schemes (The Energy Series, UN Economic Commission for Europe, Review 37, 2010). Companies are not aware of the opportunities available to harness potential energy efficiencies. Industry lacks knowledge and access to information about ways of reducing its energy consumption, and there are not enough public incentives to encourage more efficient energy use. In depth interviews from

SMEs and EE consultants which follow in this paper illustrate some of the points made here.

Competitive and efficient funding schemes are also missing from the equation. The new Serbian Government Fund for Energy Efficiency (2014) is the first allocated funding scheme solely focused on EE. Local governments lack the necessary resources to invest in EE; therefore they are gradually being introduced to the private public partnership format. Another financing route is the ESCO model, where energy savings of companies and public bodies are achieved with an Energy Service Company (ESCO) and the debt repayment comes from realized energy saving during the contracted period. This type of financing is not completely recognized within the regulatory framework, and this creates another impediment.

Externally funded financing for EE derives mostly from the European Union, International Financial Institutions (IFI) and bilateral donors which provide financing for EE related activities in four different modes, for private and/or public sector clients. The four modes of financing are: regional or country specific IFI loans, or credit lines to local banks, often with grants or subsidies (up to 20% of the investment cost), and with technical assistance (TA) provided to local banks and borrowers (EBRD, EIB, KfW, GGF, WB, EC); regional technical assistance funds generally provided by bilateral donors (USAID, SIDA, GIZ) to assist governments with policy developments and small demonstration projects; country grant funds which aim to promote EE investments and country guarantee funds (by donors) which are combined with loans from local banks.



Graph 2Available financing by type of fund
Source: Energy Community

The Word Bank stocktaking Report on Energy Efficiency (World Bank, A Stocktaking Report, 2010) observed the factors that need to be addressed in order to avoid undercutting the energy saving potential:

1. *Lack of reliable energy data*. It is not viable to gauge estimates for EE potential by country or sector with monitorable and realistic interim targets. Reliable energy consumption data are almost nonexistent in countries throughout the South East Europe region.

2. *Increased energy use in all countries and sectors*. The projections for the South East Europe region show annual growth of more than 3% in energy consumption through 2027. If no measures are taken to improve EE, energy consumption will increase dramatically in the decades ahead.

3. *Multiple barriers to energy efficiency.* The major barriers are low energy prices; cross-subsidies: residential consumers are being cross-subsidized by large industrial/commercial consumers; lack of individual meters or heat cost allocators for heat consumption; substantial commercial losses: theft and high level of non-payment of bills.

4. *Capacity building*. The institutional framework for EE requires substantial improvement.

Capacity building for the implementation of EE programs can be easily strengthened in Serbia by a process known as System of Energy Management. The introduction of energy management begins by adopting a program of energy management, and then developing an Action Plan which sets measurable goals. The Action Plan for energy administration should be publicized. Each plant in the company should have a dedicated coordinator responsible for the local energy management. All members of the energy management team should be appropriately trained and educated to perform their tasks. In addition, they need support for continuously collecting, storing, tracking and analyzing data on energy consumption. The energy administration is responsible for further educational and promotional activities to change behavior and attitudes of employees towards energy consumption in the workplace, and for the "green" public procurement. Environmental and energy practice introduced as everyday practice in companies is faced with many impediments, for

example the lack of awareness of its effects, lack of experienced personnel, limited resources and inadequate organization, just to name a few. (Morvay & Gvozdenac, 2008, p. 147).

There are numerous schemes and standards that companies can use to enhance the triple bottom line. Improvement of environmental performance of organizations, or the EU Eco-Management and Audit Scheme (EMAS) is one of them. Environmental management and audit scheme are not implemented in Serbia (Kostić, 2012).It is a management instrument developed by the European Commission for companies and other organizations to evaluate, report, and improve their environmental performance.

5 SURVEY ON THE IMPORTANCE OF ADVANCINGEE IN SME SECTOR IN SERBIA

The level of importance and implementation of EE management among Serbian small and medium enterprises (SMEs) was a topic of survey conducted in December 2012. The qualitative survey was conducted and funded by theEuropean bank for Reconstruction and Development‘s Business Advisory Services in cooperation with expert organization specialized in sustainable energy Central European Development Forum, CEDEF and marketing and public opinion research agency MASMI.

According to results of the survey, participants rated the general level of awareness of rational energy consumption in Serbia as very low among SMEs and citizens. It is perceived that the reason for this is the fact that many SMEs are struggling to remain on the market, and that for them energy saving remains a low priority. It is also considered that the State and the media are not making enough effort to inform the public about the importance of rational energy consumption. One of participants said: ”*The implementation of the energy passports has little or no media coverage“. (EBRD study 2012, p. 5)*

The financial benefits of implementing EE are more evident, especially in the time of crisis when saving on each and every cost is a priority. Along with the low level of awareness of the importance of EE, there is a problem with the lack of awareness of the professional staff in companies about EE measures. Education about this subject is also important to the workers who install the building materials. A low electricity price is sometimes perceived as linked with the lack of awareness and irrational spending. (Another survey participant commented: ”*As long as the price of electricity is low, there will be no EE!“*). *(EBRD study 2012, p. 6)*

On the other hand, electricity is considered to be a large item in the budget precisely because of the irrational spending *(”The sole price of kilowatt is low, but we use very expensive electricity in higher zones because we have a bad attitude towards the expenditure.“*) *(EBRD study 2012, p. 7)*

While the companies are somewhat familiar with the legislation concerning a narrow area of their business, legislation related to EE is, in most cases, unknown to SMEs in Serbia. For consultants and businesses that have tried to advance their EE, legislation is often perceived as an obstacle. It is highlighted, for the improvement in this area that appropriate legislation should be passed as soon as possible, as this would secure benefits for enterprises implementing EE measures and fines would be incurred by those that do not comply with the law.

6 WAYS OF IMPROVING EE AND WILLINGNESS TO ENGAGE ADVISORY ASSISTANCE

Various measures of improving EE are, or are to be, implemented in SMEs such as boiler replacement, installation of heat pumps (that use sub-terrain water), isolation, installation of more efficient lighting systems, utilization of solar heat power. Experiences of companies and consultants that worked on these kinds of projects show that there are many achieved benefits: a significant decrease in energy consumption would be evident in lower monthly bills. Furthermore, there are indirect benefits for manufacturing companies through increased market competitiveness due to the effect lower energy consumption costs would have on the price of final products (*“I think that today, in any kind of manufacturing and final product price, the biggest savings can be made by rational consumption of energy“).(EBRD study 2012, p. 8)* Also, the ecological component is perceived to be the stimulation of some companies (*“Besides saving on heat, the emission of carbon dioxide would drop by 97%“*, *“Cleaner*

production"). *(EBRD study 2012, p. 9)* It is considered that many businesses are not aware how quickly this investment can repay itself (often around 3 years and sometimes even less).

Regarding advisory assistance the general view is that SMEs in Serbia need advisory assistance in the area of improving EE, both in legislation and administration, and in technical solutions and financing issues. Due to their size, SMEs rarely have professionals capable of dealing with the issues of improving EE and financing (bigger enterprises on the other hand, prepare the majority of projects themselves, both the financial and technical sections). In the SME's sector there is no clear idea where to find advisory assistance, the sources of it are mainly perceived as unfamiliar or inaccessible. Known sources of information are manufacturers of EE equipment and consultant agencies while public institutions are not counted on for information. They also rarely perceive international and nongovernmental organizations as sources of information.

Equipment manufacturers are perceived as accessible and competent sources of information *("If I wanted to improve my lighting system, I would turn to the major company in that field, for heat pumps to some of the renowned manufacturers, and I would leave everything to their project teams."*). *(EBRD study 2012, p. 10)* Still, many emphasize that there is also certain mistrust because of the primary interest of the manufacturers to sell their own material and equipment. Manufacturers perceive this "justifiable mistrust "as a major problem that represents an obstacle for more successful communication and cooperation with clients *("When we inform our clients about the profitability of our solution we are playing both the role of manufacturer and consultant, as someone who is persuading the client, so the client may not trust us, and for good reason!")*. *(EBRD study 2012, p. 11)*

As a way to overcome this mistrust, some point to the need of having reports made by the independent authorities in the field of EE that would be available to companies. On the other hand, some of the manufacturers decide to use their own example to demonstrate the advantages of the offered solutions, arouse interest and build a customers' trust (*"We, as a firm tried to set an example to ourselves and to others, we built the EE business object so that we could demonstrate that the item is both useful and usable"*). *(EBRD study 2012, p. 12)*

7 CONSULTANTS AS A SOURCE OF ADVISORY ASSISTANCE

Based on the opinion of the survey participants, consideration and affinity towards using consultant's services among SMEs is at a very low level. Lack of awareness of consulting services, perception of high price, problems in finding a competent consultant and insufficient availability of consulting services outside of Belgrade are perceived to be most important barriers towards using consulting services in the SME sector.

Consideration of the engagement of consulting services in SME sector is on a low level, because often businesses don't have enough information about consultants and their services. Companies outside of Belgrade consider the use of consulting services even less available because they believe that consultants work mainly in Belgrade. A significant number of companies dismiss the idea because they perceive prices of consulting services too high. Consultants perceive the price as the strongest barrier, their experience shows that companies gladly use consulting services and follow received instructions when they get financial assistance for it (*"When USAID was involved in financing, 100 food industry companies used consulting service, no one refused!"*). *(EBRD study 2012, p. 13)*

Due to the lack of known information sources about consultants, SMEs usually find out through business partners and acquaintances, such engagements normally are contracted through recommendations. Businesses perceive these kinds of services as a rather unknown novelty and therefore remain unsure about any real indicators of consultants' quality. Beside recommendations, when evaluating the suitability of a consultant, references feature as an important criteria. Nevertheless, in some cases references also prove to be misleading.

("In the end I concluded that the longer consultants reference list was, the more I questioned how it was possible for a consultant to participate in that many projects?"). (EBRD study 2012, p. 14)

8 FINANCIAL ASSISTANCE AS A SOURCE FOR IMPROVING EE IN SMES SECTOR

The survey's participants pointed out that SMEs are mainly not aware about the possibilities of obtaining financial assistance for projects involving improvements in EE. These kinds of projects are financed by either personal resources or bank loans, often raised on commercial terms. Many companies are not aware that they can diversify their financial assistance by obtaining funds from various sources, which can substantially decrease their own personal investment. On the other hand, it is important that the consultants are informed about as many sources of financing as possible, because having appropriate financial assistance significantly raises the willingness of companies to use consulting services, but also because it determines the project setup.

The government is criticized due to its lack of effort in developing financing sources for EE projects. One of the suggestions is to rationalize energy spending on a state level and then use those saved funds for EE projects (*"Financing EE should be systemically solved, last winter we imported Euros 300 million worth of electricity. If we had optimized the spending those 300 million could now be in some fund"*). *(EBRD study 2012, p. 14)*

9 KEY BARRIERS FOR SMES TOWARDS IMPLEMENTING EE PROJECTS AND WAYS TO OVERCOME THEM

According to the participants, the lack of awareness of SMEs about the multiple benefits of implementing projects concerning EE and the value of the initial investment are the main barriers that stand in the way of implementing them more often. It is known that SMEs often work in difficult circumstances, so they don't even think of implementing EE projects. Companies believe that it is very risky to invest large funds, and don't consider long-term project profitability. Initial investment is also an important barrier due to the liquidity issues, generally unfavorable conditions in Serbia, and the inability to collect that consistent stable business (*"Every day more companies find out about these loans, but they postpone projects for better times, liquidity is more important to them!"*). *(EBRD study 2012, p. 15)* Several ways were proposed for overcoming these barriers:

- If there was more information about the sources of financial assistance for EE projects, initial investment would be perceived as less of an obstacle. Financial aid is shown to be a major incentive, even more important than savings projections. Consultants can help overcome this barrier by offering information about the sources of financial assistance (based on the specifics of each case, they can evaluate which source is the most cost-effective solution) and by mediating between the client and the financial source.
- It is important to put into perspective the perceived risk of these investments by putting forward arguments and by informing the companies the time period it will take for the investment to be repaid and then the financial benefit it can expect from implementing it ("If you explain to companies that the annual saving is near or equal to the loan made for the investment, then there is no reason for them to refuse").
- Some participants suggest that the payment of consulting services and materials could be made after the project implementation, when EE results could be measurable and visible.
- Higher availability of advisory services could also be found in establishing consultant firms that would be in charge of tracking EE on behalf of several SMEs, due to the fact that SMEs often cannot afford to engage a person responsible for its EE.

When a company finally decides to engage consultants, it often doesn't know how to reach them and, subsequently, how to assess their expertise when they do. This is due to the fact that consulting practice is not yet widespread in Serbia, and companies often doubt consultant's competence. Several ways have been suggested on how to check the competence and reputation of a consultant:

- Certification is seen as one of the ways to ensure a consultants credibility and to facilitate the selection of a competent consultant specializing in a specific area.

- Choice by tender is a good solution because the tender results are not binding, and the company can get more offers and assess the quality in that way.
- A system of recommendations consultants received from previous clients (with their contact details) could be a more reliable and informative way to assess the quality of consultants than just by a reference system.

Large amounts of financial assistance implies demanding and lengthy procedures, which can discourage some companies from applying due to the lack of time and resources (*"The procedure can last for a year, and that's a very hard journey"*).*(EBRD study 2012, p. 15)* One of the ways companies can cope with this problem is to engage a consultant which would help with the documentation collection process.

State administration and problems with the application of laws that regulate the field of EE complicate the application process for financial assistance, and thus further discourages interest in EE projects. Some suggestions were listed:

- Increasing media attention for this issue is seen as a good way to influence the government.
- Administration should be less bureaucratic (*"The focus should be on business! "*).*(EBRD study 2012, p. 15)*
- Government should make these projects more available ("*We don't have as many favorable sources of financing as do other markets"*). *(EBRD study 2012, p. 15)*

Initiating an EE project is not a sure sign that the project will ultimately be implemented and brings benefits to the company. The general experience of consultants shows that strong resistance among workers could appear, primarily because of a change in the work routine (*"You can implement any measure you like, but if a worker pushes the button or unwinds the valve there is no measure that will make any significant effect"*) *(EBRD study 2012, p. 16)* A consultant can be seen as someone who endangers their positions by highlighting the errors made in the system (*"They saw my role there as someone who came to show how the workers were not doing their jobs well, and that they may get fired because of my analysis"*).*(EBRD study 2012, p. 17)* Everyone agrees that management commitment is essential for working out these problems with employees. According to participants' statements, for the positive effects of the project, consultants should facilitate the education of workers about the importance of EE for the company. They could develop and increase EE awareness and consequently change the attitude towards the working process.

10 CONCLUSION

Serbia, a member of Energy Community of South East Europe has harmonized the regulatory environment concerning energy with the EU directives. In the scope of the current Serbian Energy Strategy, energy efficiency (EE) has been recognized as the second priority of the economical use of quality energy products. Industry in Serbia uses 34% of final energy consumption. Companies in Serbia predominantly use electricity, the most energy inefficient and expensive form of heat generation, so overspending is the consequence, resources are drained, and pollution increases. Two major factors contribute to the lower level implementation of EE management in Serbia: lack of information and more competitive funding schemes.

The level of importance and implementation of EE management among Serbian small and medium enterprises (SMEs) was a topic of survey conducted in December 2012. The participants rated the general level of awareness of rational energy consumption in Serbia as very low among SMEs. It is perceived that the reason for this is the fact that many SMEs are struggling to keep the business going, and that for them energy saving remains a low priority. It is also considered that the State and the media are not making enough effort to inform the public about the importance of rational energy consumption. Regarding advisory assistance in the domain of EE the general view is that SMEs in Serbia need advisory assistance in the area of improving EE, both in legislation and administration, and in technical solutions and financing issues.

The survey's participants pointed out that SMEs are mainly not aware about the possibilities of obtaining financial assistance for projects

involving improvements in EE. These kinds of projects are financed by either personal resources or bank loans, often raised on not attractive commercial terms. The government is criticized due to its lack of effort in developing financing sources for EE projects.

Several ways were proposed for overcoming these barriers: more information about the sources of financial assistance for EE projects, consultants can help overcome this barrier by offering information about the sources of financial assistance; payment of consulting services and materials could be made after the project implementation, when EE results could be measurable and visible; higher availability of specialist advisory services; increasing media attention as a means of influencing the government to make administration less bureaucratic; government should make more sources of financing available to SMEs.

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