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FINANCING ENERGY EFFICIENCY INVESTMENTS FOR CLIMATE CHANGE MITIGATION

Background Paper on the Regional Analysis of Policy Reforms to Promote Energy Efficiency and Renewable Energy Investments

Note by the secretariat

I. INTRODUCTION

1. In accordance with the Work Plan (ECE/ENERGY/WP.4/GE.1/2009/6) and the Project Document on Financing Energy Efficiency Investments for Climate Change Mitigation, the United Nations Economic Commission for Europe (UNECE) has engaged, as a contractor, Pöyry Energy Consulting AG to undertake Regional Analysis of Policy Reforms to Promote Energy Efficiency and Renewable Energy Investments. This note by the secretariat is based on the Executive Summary of the final report and summarizes the results of the regional analysis of policy reforms in selected countries of the UNECE.

II. BACKGROUND

2. South-Eastern European, Eastern European and Central Asian countries are confronted with a wide range of economic and environmental problems caused by their inefficient and

polluting energy systems. At the same time, their energy economies provide some of the most promising opportunities for reducing global greenhouse gas emissions. This will require the use of cost-effective energy efficiency improvements and renewable energy technologies – the main self-financing methods to implement climate change mitigation.

3. The investment potential for energy efficiency in these countries is so large that only the private sector can provide the capital needed to achieve meaningful results. This in turn will require a market for energy efficiency in which large investments can be made with low transaction costs at an acceptable risk-to-returns ratio and within a reasonable period of time. At present, private investors do not often finance energy efficiency projects in these countries because dedicated sources of financing are lacking and local banks are generally unfamiliar with such investments. Another obstacle in financing energy efficiency projects is the absence of policy and institutional support for their implementation. The lack of knowledge and experience on how to select and formulate energy efficiency investment projects is often a challenge for local experts.

4. In order to address these obstacles, in January 2008 the UNECE began implementing the Financing Energy Efficiency Investments for Climate Change Mitigation (FEEI) Project. The project is designed to assist countries from Eastern Europe, South-Eastern Europe and Central Asia to enhance their energy efficiency and reduce air pollution and greenhouse gas emissions in order to meet international obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and UNECE environmental conventions. Twelve countries from Eastern Europe, South-Eastern Europe and Central Asia are included in the scope of the activities: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Kazakhstan, Republic of Moldova, Romania, Russian Federation, Serbia, the former Yugoslav Republic of Macedonia and Ukraine. The goal of the FEEI Project is to promote market formation so that self-sustaining energy efficiency and renewable energy projects can be identified, developed, financed and implemented locally in participating countries.

5. Funding for the project has been provided by the following supporting institutions:

(a) United Nations Foundation / UN Fund for International Partnerships (UNF/UNFIP);

(b) United Nations Environment Programme / Global Environment Facility (UNEP/GEF);

(c) Fonds Français pour l'Environnement Mondiale / Agence Français de Développement (FFEM/AFD); and

(d) European Business Congress e.V. (EBC).

In-kind contributions for the Project are provided by the participating countries and by the UNECE Secretariat.

III. GOALS, SCOPE AND APPROACH OF THE ANALYSIS

6. The Regional Analysis for Policy Reforms to Promote Energy Efficiency and Renewable Energy Investments is conceived as a wide-ranging regional assessment, including case studies, expert workshops and senior policy maker seminars. The main goal of the analysis is to provide recommendations addressed to the policy makers of the participating countries in order to develop and implement policy reforms that will support market formation and foster a favorable climate for investments in the sectors of energy efficiency and renewable energy sources. To achieve this goal, an interactive approach has been applied with active involvement of the designated National Coordinators (NCs) and National Participating Institutions (NPIs) from the project countries and direct contributions from experts which has been collected and consolidated in the final report.

IV. OVERVIEW OF THE ENERGY SECTOR IN THE PROJECT REGION

7. The countries in the project region show huge differences in their economic development, energy supply and legislative and regulatory framework, while the common aspect appears to be the urgent need for investments in energy efficiency and renewable energy sources. While half the reviewed countries have per capita gross domestic product (GDP) above the world's average, some countries, in particular the Republic of Moldova and Albania, are well below this threshold. On the other hand, Croatia and the Russian Federation are not far from reaching the average of the 27 member states of the European Union (EU), while the two new EU member states Bulgaria and Romania are still well below that indicator.

8. Apart from Kazakhstan and the Russian Federation, which are large energy exporters, all other project countries have significant dependency on energy imports, which reach 86 per cent and 97 per cent in the cases of Belarus and the Republic of Moldova, respectively. This fact points out that enhancing efficiency in the primary energy use and exploiting the domestic potential of renewable energy sources is the most sustainable way to reduce dependency on energy imports.

9. All countries in the project region are in the process of deregulation and liberalization of their energy markets, with electricity markets having generally the highest degree of progress and gas and heat markets very often lagging behind. Regulations and provisions regarding the energy sector are available in all project countries but the structure, goals and scope of the national legislation differ significantly between the countries.

10. Regarding energy intensities, all countries of the project region (with Albania and Croatia being the only exceptions), are well above the EU-27 average, with such countries as Kazakhstan, Serbia and the Russian Federation being among the countries with highest energy intensity in the world. While a rather satisfactory situation can be observed with respect to deployment of renewable energy sources in many project countries, it must be noted that the major contribution to renewable energy sources comes from the widespread use of large hydropower stations for the generation of electricity and use of fuel wood for domestic heating purposes, while other renewable energy sources (geothermal, solar, wind, and small hydropower) have only a negligible share.

V. BARRIERS TO INVESTMENTS IN ENERGY EFFICIENCY AND RENEWABLE ENERGY PROJECTS IN THE PROJECT REGION

11. One of the main goals of the Regional Analysis is the identification of barriers to investments in energy efficiency and renewable energy projects in the project region, in order to develop recommendations for policy makers on how to overcome them. The identified barriers are classified in three groups:

(a) Legal, institutional and administrative barriers;

(b) Economic and financial barriers;

(c) Lack of awareness, human capacities and professional skills.

A. Legal, institutional and administrative barriers

12. Legal, institutional and administrative barriers can be manifold and very difficult to be addressed because of different administration and policy-making levels involved. The most frequently encountered barriers of this kind in the project region are:

(a) Complexity and lack of transparent structure of the regulatory framework;

(b) Regulatory instability and discontinuity, caused by political instability in the country and/or by frequent and uncoordinated updates and revisions of the current policy framework;

(c) Lack of secondary legislation and operational instructions, tools, standards and procedures necessary to implement primary legislation or strategic programmes;

(d) Excessive bureaucratic obstacles, non-transparent administrative procedures and complex and cumbersome authorization procedures for new projects;

(e) Absence of dedicated public procurement guidelines for acquisition of energy efficient equipment and requests for provision of energy services to public entities;

(f) Inefficient or limited use of public tendering processes for energy efficiency and renewable energy projects;

(g) Lack of cooperation between different ministries and agencies involved in energy policy as well as between authorities at the national and local levels;

(h) Unresolved property issues in multi-resident apartment building and significant fragmentation of land property, which significantly limits feasibility of energy efficiency investments in the housing sector and increases costs for the development of renewable energy projects.

B. Economic and financial barriers

13. Many economic barriers that hinder financing and implementation of attractive projects come from inefficiencies in the structure of the energy markets:

(a) State intervention in the price formation, artificially low tariffs for final customers and cross-subsidies between customer segments;

(b) Energy tariffs which do not fully cover costs and therefore limit the profitability of energy efficiency projects; furthermore these tariffs do not take into account the environmental costs of energy supply and do not offer incentives for a change of behaviour of the final consumers;

(c) Environmental and economic efficiency of energy efficiency and renewable energy projects is hindered by obsolete and insufficient infrastructure for transmission and distribution of energy (grid losses, lack of adequate grid connection, lack of metering), even when the business case for the project itself is attractive;

(d) Local utilities and distribution companies that are facing serious profitability problems in face of insufficient payment rates and/or unprofitable regulated customer tariffs do not have adequate financial means for infrastructure improvement and are therefore reluctant to support or push forward even promising energy efficiency projects;

(e) Public ownership of energy companies, which creates a conflict of interest between the company profitability and the pursuit of political interests through socially popular pricing policies;

(f) Insufficient availability of public funds for financing initiatives and programmes: premium tariffs for renewable energy sources are developed but often not operational and are frequently of limited extent (e.g. they apply only to certain technologies or have restrictive requirements). Energy efficiency funds, if they are operational, have limited resources; alternative incentive measures such as dedicated credit lines providing soft loans, tax exemptions or support schemes for third-party financing are often not in place;

(g) Small size of energy efficiency and renewable energy projects, resulting in relatively high evaluation and transaction costs per project;

(h) High interest rates applied by local banks to medium- and long-term loans and restrictive requirements for collaterals.

C. Lack of awareness, human capacities and professional skills

14. These barriers involve all stakeholders involved in identification, development, financing

and implementation of energy efficiency and renewable energy projects and require extensive work of awareness-raising and capacity-building to achieve tangible results:

(a) Insufficient political commitment to implement the necessary policy reforms;

(b) Lack of qualified human resources and insufficient professional expertise among local authorities for implementation of identified projects;

(c) Lack of experience in financing energy efficiency and renewable energy projects and lack of awareness of possible economic benefits arising from energy efficiency and renewable energy projects among commercial banks;

(d) Lack of training and education possibilities for professionals with adequate skills or conducting energy audits, identification of attractive project opportunities, and reparation of bankable project proposals;

(e) Lack of awareness on the side of consumers, which are used to regard energy more like a public service than a valuable good and are very reluctant to change their consumption behaviour unless this implies a tangible improvement of their living standard;

(f) Limited or absent demand for the services of energy servicing companies (ESCO).

VI. CASE STUDIES

15. The Regional Analysis includes 12 case studies, which are meant to serve as examples of success stories to overcome bottlenecks and barriers for investments. Their purpose is to allow cross-country comparison and to motivate policy makers to replicate the success stories in their countries through adjustment to local conditions. The case studies are listed and described in the Annex.

VII. RECOMMENDATIONS FOR POLICY REFORMS

16. The ultimate objective of the Regional Analysis is the development of a set of recommendations for policy reforms addressed to the attention of national and local policy makers in order to overcome the identified barriers to investments in energy efficiency and renewable energy sources. These recommendations have been developed based on the detailed analysis of the country-specific progress in implementation of policy reforms and market formation and subsequently identified barriers that still need to be overcome, as well as on the results of implementation of the Case Studies in project countries and in neighbouring countries with similar framework conditions. The Case studies provide examples of successful implementation thus indicating ways and means for replication of these success stories in other project countries that face similar barriers. Country-specific recommendations are developed for each project country. However, the following more general recommendations are applicable to all or many project countries.

17. **Development of policy frameworks**. Countries of the project region should develop sound strategies, action plans and implementation programmes, which constitute the policy framework that identifies the measures that can cost-effectively yield energy savings and increase renewable energy generation in the short term, assigns the responsible institutions in charge of developing, implementing and monitoring the policies and programmes, and indicates the financial resources for these activities.

18. **Monitoring of policy implementation**. Countries of the project region should establish regular and institutionalized monitoring of policy implementation. This should involve communicating policy requirements to all concerned parties, ensuring that targets of positive support for policy changes are identified, clearly identifying the need for and the nature of required changes, as well as sources of potential resistance to these changes and ways to overcome it.

19. **Transparent procedures for tendering, authorizations, grid connections**. Standard Bidding Documents provide a guide to transparency in procurement opportunities and in contract evaluation and award procedures, while authorization procedures require clear guidelines and the definition of an obligatory response period for the institutions involved. Master Plans for Transmission Grid should identify and evaluate the needs for an upgrade and expansion of the transmission capacity, while grid connection and accounting rules for grid costs should be formulated in appropriate legislation and regulations.

20. **Spatial planning for renewable energy projects**. Adjustments to existing legal framework that take into consideration specific needs of new renewable energy initiatives can be time consuming and can delay implementation of such initiatives. National and local authorities can stimulate development of renewable energy projects by allocating areas suitable for their implementation in the framework of spatial planning.

21. **Metering and consumption-based billing**. As a first step, installation of individual meters in new buildings and buildings undergoing major renovations should be mandatory where this has not been applied yet. As a second step, an action plan for a nationwide rollout of individual metering systems should be developed, evaluating different options, which are technically possible, financially reasonable, and proportionate in relation to the potential energy savings, and indicating overall and intermediate targets.

22. **Establishment or strengthening of institutional structures**. Dedicated institutions responsible for implementation of the energy efficiency and renewable energy policies should be established or strengthened. Such institutions may include national agencies for renewable energy and energy efficiency, regional networks of energy agencies under the umbrella of a national energy agency, and municipal energy agencies. These institutions should ensure the availability of reliable statistical information essential for understanding the current situation and monitoring the effectiveness of policies.

23. **Energy tariff reforms**. The countries should conduct a tariff reform, which should not simply mean higher tariffs for energy services but should primarily encourage energy efficiency measures and use of renewable energy. Tariff levels and tariff structure (also by the type of

consumer) should reflect fully the costs of provision of energy services, including operation and maintenance costs and capital investments to improve services. The tariffs should internalize environmental costs in the energy prices.

24. **Provision of financial incentives for energy efficiency and renewable energy sources**. The most comprehensive legislation cannot guarantee that energy efficiency and renewable energy measures are implemented without provisions in place that encourage and support investments. Financial incentives (e.g. capital grants, third-party finance, investment tax credits, property tax exemptions, production tax credits, sales tax rebates, excise tax exemptions etc.) focused on cost reductions and improving the relative competitiveness of sustainable energy technologies in given markets should be put in place.

25. **Advanced feed-in tariffs**. Advanced feed-in tariff schemes should be introduced to ensure the least cost approach while considering future technology development, changes in market competition and optimum resource utilization.

26. **Increase of public awareness and dissemination of information**. The national governments with participation of local and regional authorities should develop information and awareness raising programmes in order to inform citizens of the benefits and practicalities of energy efficiency measures and use of renewable sources.

27. **Capacity building**. Capacity building programmes should be developed and implemented to better inform decision makers of the ways to improve energy efficiency and achieve renewable energy objectives. Such programmes (appropriately customized for the specific audience) should provide information and training to government officials, investors, banks and project developer on the state-of-the-art technologies, successful institutional models, innovative financing mechanisms, as well as methodologies and tools for practical identification and preparation of bankable projects.

VIII. CONCLUSIONS

28. The conducted analysis resulted in the development of a set of recommendations for policy reforms addressed to the policy makers in the project countries, in order to overcome the existing barriers to investments in energy efficiency and renewable energy projects. All recommendations provided meet the following criteria:

(a) Have potential to provide significant energy savings or generate significant amounts of renewable energy at a relatively low cost;

(b) Address existing market barriers and significant gaps in existing policy frameworks;

(c) Are broadly supported by international institutions and experts.

29. The recommendations present a cohesive set of measures and instruments, responding to the need of overcoming barriers to energy efficiency and renewable energy, which are pervasive,

dispersed, and complex. The implementation of the full set of measures is highly recommended to achieve significant improvements in energy efficiency and use of renewable energy. At the same time, it is essential to set priorities in the implementation of policy reforms. For this purpose, the governments should focus on three clusters of measures, each of which is necessary to achieve the full energy efficiency and renewable energy potential in the project region:

(a) **"Quick Wins"** will demonstrate some rapid results and increase political support. These measures can be introduced in less than a year and are likely to produce significant impact at moderate costs;

(b) **"Essentials"** are the backbone of a comprehensive energy efficiency and renewable energy policy, affecting the areas of greatest potential by raising standards and stimulating investments that are already financially viable;

(c) **"High Cost, High Return"** measures will remove fundamental barriers and will make more energy efficiency and renewable energy investments financially viable. These interventions carry a much higher initial cost to the economy but most of them have a high return in terms of energy savings or renewable energy generation and are crucial to ensure long lasting impact and sustainability.

30. Another essential step towards successful implementation of the policy reforms recommended is the allocation of clear responsibilities for implementation and monitoring to governmental institutions and agencies. Development of an action plan or a roadmap, including realistic estimate of the necessary timeframe and resources and provision of dedicated financial and other resources would be critical for this purpose.

31. Development and successful implementation of policy reforms to support energy efficiency and renewable energy is vital for the economies in the project countries to overcome the present dependency on energy imports (with exception of Russian Federation and Kazakhstan) and non-rational use of energy resources as well as to mitigate adverse climate change effects and should be therefore assigned a high priority in the political agenda of the national governments.

ANNEX

Table 1: Overview of Case Studies

No.	Case Study	Topic	Country (Origin)	Removed Barriers	Countries for which Case Study is recommended
1	Greening Facility - State Environmental Fund	Financing a Public Fund	Czech Republic	The Case study refers to the financing of a public fund through the sale of CO2 emission certificates. The Case Study contributes to removing financial barriers and strengthening financial capabilities of national governments by raising additional money for a public fund supporting energy efficiency and renewable energy measures.	Romania, Bulgaria, Ukraine, and Russian Federation
2	Energy Efficiency Demonstration Zone	Capacity building on municipal energy efficiency planning and specialized training for local energy decision-makers and municipal authorities	Bulgaria	The Case Study refers to municipalities and their functions with respect to energy planning and management. Its objectives are to provide municipalities with the required competencies in energy efficiency related projects. This is achieved through a variety of activities: specialized studies, dissemination of general and specific information about efficient use of energy resources, training of local decision-makers and experts on energy planning and management. The Case Study contributes to strengthening managerial and planning capacities of municipalities to undertake energy efficiency projects by improving competencies and providing know-how.	Kazakhstan, the former Yugoslav Republic of Macedonia, Serbia, and Ukraine
3	Water Efficiency – Tariff Reform Programme	Tariff reform	Russian Federation	The Case Study refers to the implementation of a tariff reform aiming at rehabilitating water infrastructure of the City of Cherepovets. The Case Study contributes to removing financial barriers for utilities facing lack of financial resources due to insufficient revenues from artificially low water tariffs for final customers and therefore allowing to invest in water efficiency projects.	Bulgaria and Ukraine
4	Market Transformation on Solar Water Heating	Awareness raising, labeling, capacity building and financial support	Albania	The Case Study refers to the establishment of a programme to build up a market for solar water heating. The Case Study contributes to removing barriers related to lack of awareness and capacities as well as financial barriers by raising awareness of the target audience and providing information, strategic advice, technical training and financial support.	Bosnia and Herzegovina, Croatia, Kazakhstan, Republic of Moldova, Serbia, the former Yugoslav Republic of Macedonia (excluding financing), and Ukraine
5	TSKB - Environmental Impact Assessment of Projects	Establishment of standards within the banks, imposing environmental and energy screening of all projects prior to financing	Turkey	The Case Study refers to setting up standard procedures aiming at screening each project from financial, technical and environmental points of view. The concerned Turkish bank has been the first one to receive ISO 14001certification. The Case Study contributes to removing barriers related to the provision of medium- and long-term loans for projects not achieving	Albania, Bosnia and Herzegovina, Kazakhstan, Republic of Moldova, the former Yugoslav Republic of Macedonia, and Ukraine

				targeted objectives in terms of social, financial and environmental benefits. Through screening procedures, projects are prioritized, and financing is only provided when all bank requirements are satisfied.	
6	Incentives for Foreign Investments	Support to foreign investments	Bosnia and Herzegovina	The Case Study refers to the establishment and approval of a set of incentives aiming at supporting and attracting foreign investors. The Case Study contributes to removing legal and administrative barriers of doing business in the country.	Kazakhstan, Republic of Moldova, and Russian Federation
7	Sustainable Energy Financing Facilities - Dedicated Loan Facilities to Local Banks Undertaking Energy Efficiency Projects	Design of dedicated credit lines	Bulgaria	The Case Study refers to the establishment of dedicated loan facilities to local banks for on-lending to clients (residential and industrial credit lines) undertaking energy efficiency and renewable energy projects. The Case Study contributes to removing financial barriers in particular related to the lack of loans from local commercial banks to companies in industrial and residential sectors willing to undertake energy efficiency and renewable energy projects.	Albania, Republic of Moldova, and the former Yugoslav Republic of Macedonia
8	Enhancement of Awareness Raising through the Development of a Network of Certified Energy Auditors	Awareness raising	Slovenia	The Case Study refers to the establishment of an Energy Auditing Programme implemented by an association of certified energy auditors with the objective to enhance the penetration of energy auditing procedures through transfer of know-how and experience in energy auditing. The Case Study contributes to removing such barriers as lack of awareness, know-how and experience on the part of decision makers, municipalities, property owners related to energy efficient building technologies and lack of market for energy auditing services.	Albania and the former Yugoslav Republic of Macedonia
9	Forest Resources and Technology Project (FOREST)	Awareness raising and capacity building	Russian Federation	The Case Study refers to the successful implementation of a wood energy programme. The Case Study contributes to exploring and promoting the use of wood and wood waste as a source for production of electricity and heat power to be used in wood processing facilities and municipal communities.	Albania, Romania and the former Yugoslav Republic of Macedonia
10	Establishment of ESCO	Energy Performance Contracing / ESCO services	Croatia	The Case Study refers to a successful establishment of an energy service company (ESCO) engaged in financing energy efficiency projects on a commercial basis. The Case Study contributes to removing financial barriers as well as barriers related to lack of technical capacities by establishing an ESCO, which prepares, finances and implements energy efficiency projects on a commercial basis.	Bosnia and Herzegovina, Kazakhstan, Republic of Moldova, and Serbia
11	Municipal Finance Facility	Third party financing including technical capacity building	Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia	The Case Study refers to the successful implementation of a finance facility stimulating commercial bank lending to small and medium-sized municipalities and their utility companies. The Case Study contributes to removing barriers to commercial third-party financing and risk sharing as well as lack of capacity for the development of bankable	Republic of Moldova, Kazakhstan, Romania

				projects specifically for municipalities.	
12	Ukraine Energy Efficiency Programme	Third party financing, capacity building	Ukraine	The Case Study refers to the establishment of a financing facility permitting private sector companies to reduce their energy intensity and operating costs. The case study contributes to removing financial barriers and strengthening financial capabilities of industrial companies to develop bankable energy efficiency and renewable energy projects.	Albania, Belarus, Bosnia and Herzegovina, Republic of Moldova, and Russian Federation