

United Nations Development Programme
Country: Republic of Serbia
PROJECT DOCUMENT¹

Project Title: Removing Barriers to Promote and Support Energy Management Systems in Municipalities throughout Serbia

UNDAF Outcome(s): Outcome 2: Sustainable Development and Social Inclusion Enhanced

Expected CP Outcome(s): 2.5 - Improved mechanisms to protect the environment, ensure sustainable management of natural resources, and mitigate and/or adapt to the impacts of global climate change on social, economic, and ecologic systems

Expected CPAP Output(s): 2.5.4.3: Improved energy sector performance through enhanced market mechanisms, renewables and demand-side initiatives

Executing Entity / Implementing Partner: Ministry of Mining and Energy on behalf of Government of Republic of Serbia

Implementing Entity/Responsible Partners: UNDP

Brief Description

The project objective is to introduce and support the implementation of municipal Energy Management Systems (EMS), including Energy Management Information Systems (EMIS), throughout Serbia, to increase the energy efficiency investments in public buildings and municipal services and to facilitate their more energy efficient operation in general. While the minimum project target by the end of the project is to have at least 30 Serbian municipalities to formally adopt and start the implementation of EMS and EMIS, the project also seeks to facilitate their replication in other Serbian municipalities.

Programme Period:	<u>2015-2020</u>
Atlas Award ID:	<u>00087720</u>
Project ID:	<u>00094643</u>
PIMS #	<u>4588</u>
Start date:	<u>Sep 1, 2015</u>
End Date	<u>Aug 31, 2020</u>
Management Arrangements	<u>NIM</u>
PAC Meeting Date	<u>July 16, 2015</u>

Total resources required:	<u>US\$ 21,900,000</u>
Total allocated resources:	<u>US\$ 21,900,000</u>
Regular UNDP (TRAC):	<u>US\$ 200,000</u>
Other:	
GEF	<u>US\$ 2,300,000</u>
Other Cash	<u>US\$ 17,200,000</u>
In-kind	<u>US\$ 2,200,000</u>

¹ For UNDP supported GEF-funded projects, as this includes GEF-specific requirements

Agreed on behalf of Government of Republic of Serbia

1. SITUATION ANALYSIS

1.1. Context and Global significance

1.2. Existing barriers and current government policies and strategies

1.3. Institutional Framework and Roles



Aleksandar Antić
Minister of Mining and Energy

SIGNATURE

21/10/15

Date/Month/Year

Agreed by UNDP:

1.4. Project Rationale and Global Policy Context

1.5. Country Ownership, Country Capacity, and Commitment

1.6. Financial Viability and Cost-effectiveness

1.7. Sustainability/Institutional Framework



Irena Vojáčková Sollarano
Resident representative

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13/10/15

Date/Month/Year

2. TOTAL BUDGET AND WORKPLAN

3. MANAGEMENT ARRANGEMENTS

4. MONITORING, EVALUATION AND EXAMINATION

5. GLOBAL CONTEXT

6. ANNEXES

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Annex 1.3. Terms of Reference

Annex 1.4. Stakeholder Engagement Plan

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Annex 1.7. Capacity Assessment

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DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

UNDP COUNTRY OFFICE SERBIA PROJECT FOR THE COUNTRY OFFICE SUPPORT TO PROGRAMME

SIGNATURE PAGE

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LIST OF ACRONYMS

CO	UNDP Country Office
CO₂	Carbon dioxide
DH	District heating
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EIA	Environmental Impact Assessment
EMS	Energy Management System
EMIS	Energy Management Information System
EPS	Elektroprivreda Srbije (national power utility “Electric Power Industry of Serbia”)
EU	European Union
EUR	Euros
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GWh	Gigawatthour
HQ	UNDP Headquarters
IEA	International Energy Agency
ICT	Information and Communication Technology
ISO	International Organisation for Standardization
M&E	Monitoring and Evaluation
MoME	Ministry of Mining and Energy
MoF	Ministry of Finance
MRV	Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NGO	Non-Governmental Organization
NEEF	National Energy Efficiency Fund
O&M	Operation & Maintenance
PB	Project Board
PIR	Project Implementation Review
PMU	Project Management Unit
PPG	Project Preparation Grant
PPP	Purchasing Power Parity
PSC	Project Steering Committee
PUC	Public Utility Company
PV	Photovoltaic
QPR	Quarterly Progress Report
RCU	UNDP Regional Coordination Unit
RE	Renewable Energy
RTA	Regional Technical Advisor
SCTM	Standing Conference of Towns and Municipalities
SWH	Solar water heater
TPR	Tripartite Review
TTR	Terminal Tripartite Review
WB	World Bank
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. SITUATION ANALYSIS

1.1. Context and global significance

1. The total energy-related GHG emissions of Serbia in 2012 were estimated at 44,09 million tonnes of CO_{2eq}². The related indicators are presented in table 1.1, together with those of the other countries of the region. As illustrated by the table, for all the indicators Republic of Serbia belongs to the region's top 5 GHG emitting countries. Compared to the OECD, Republic of Serbia's energy intensity in terms of primary energy supply per GDP in USD (2005) exceeded the OECD average by about 4 times in 2012 and by about 60% on the basis of purchasing power parity (PPP) adjusted GDP.

Table 1.1 Total GHG emissions and related indicators in 2012 for selected countries of South-Eastern Europe (Source: IEA Key World Energy Statistics 2014).

Country	CO _{2eq}	CO ₂ /TPES	CO ₂ /Population	CO ₂ /GDP	CO ₂ /GDP(PPP)
	Mtons	tCO ₂ /toe	tCO ₂ /capita	kgCO ₂ /USD(2005)	kgCO ₂ /USD(2005)
Albania	3,83	1,84	1,21	0,34	0,15
Austria	64,73	1,96	7,68	0,19	0,21
Bosnia and Herzegovina	21,22	3,18	5,54	1,65	0,75
Bulgaria	44,30	2,41	6,06	1,31	0,50
Croatia	17,19	2,17	4,03	0,38	0,25
Greece	77,51	2,92	6,99	0,37	0,33
Hungary	43,55	1,86	4,39	0,40	0,26
FYR Macedonia	8,69	2,93	4,13	1,19	0,44
Moldova	7,62	2,33	2,14	2,06	0,58
Montenegro	2,30	2,16	3,70	0,80	0,35
Romania	78,97	2,26	3,93	0,67	0,33
Serbia	44,09	3,05	6,10	1,58	0,63
Slovakia	31,88	1,91	5,90	0,51	0,28
Slovenia	14,63	2,09	7,11	0,38	0,29
Ukraine	281,07	2,29	6,16	2,94	0,83
<i>OECD</i>	12 146,00	2,31	9,68	0,31	0,31

Energy Supply and Consumption in Republic of Serbia

2. The total primary energy supply (TPES) of Republic of Serbia in 2012 was 14,53 Mtoe, dominated by locally produced coal (lignite) with a share of 52.48 %, followed by oil products (23.14%), natural gas (11,55%), biofuels and waste (7,1%) and hydro (5,5%). The residential sector and the commercial and public services were accounting for some 36% and 10% of Serbia's total final energy consumption (879 Mtoe), 52% and 18% of the electricity consumption and 55% and 11 % of the heat consumption, respectively, in 2012. For power generation, the primary energy source is lignite with a share of over 86 % in 2012, while for combined heat and power generation (CHP) and separate heat only plants the main energy source is natural gas (with a share of about 66% in 2012), complemented by lignite (17%) and oil (16%).³

3. Lignite with high sulphur content is the most significant indigenous energy resource. Its inherently inefficient extraction due to its low calorific value and the ratio of lignite to overburden, the very large areas of land given to open cast mining influencing both the direct and lost opportunity costs, the relatively low power generation efficiency of the existing thermal power plants and their detrimental

² <http://www.iea.org/publications/freepublications/publication/KeyWorld2014.pdf>

³ Source: Energy Balance of the Republic of Serbia for 2014

environmental impacts are, however, challenging the environmental sustainability of and create additional costs to lignite based energy production. These inefficiencies are partly compensated by the relatively large share of hydro power providing flexibility to the operation of the Serbian power system in general. The available power supply regulation capacity is further enhanced by a pump storage hydro power plant “Bajina Basta” with the capacity of 614 MW for both operation modes. In addition, Republic of Serbia has some domestic natural gas and oil production, which contributed to the total supply of these fuels by 17,4 % and 30,3%, respectively, in 2012. The rest was imported, primarily from Russia and Kazakhstan and for the refined oil products also from the neighbouring countries.

4. The biomass use for heating in both households and the industrial sector is significant. The majority of households in rural areas use wood (89%) and the proportion is significant also in urban areas (34%). Most households that use wood (81%) have stoves and a few have open fireplaces. A significant share (18%) use wood also in individual central heating systems. Beside households, woody biomass is also used by some public buildings such as schools and health care centres, although to a lesser extent.⁴

5. Based on the findings of the project preparatory phase of the recently started another UNDP/GEF funded climate change project in Republic of Serbia “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”, it was concluded that it is “clear that both the heat and electricity sectors present significant opportunities for the future bioenergy market development in Republic of Serbia. Despite the fact that wood industry residues are almost entirely exploited for various purposes, forest residues remain largely unexploited. It is estimated that less than 10% of forest residues are currently utilized and therefore these could become a significant source of biomass for wood fuels production in the future.”

6. The share of thermal vs. hydro power generation vary from year to year, but typically over 70 % of the annual power generation is thermal based. The current power generation costs for both the thermal and hydro power are relatively low compared to many other countries due to the fact that most generation facilities are old and already fully amortized, the lignite mines are fully owned by the national electric utility Elektroprivreda Srbije (EPS) and are in close vicinity to the thermal power plants and the water usage fees for hydro power are low. All this is resulting in that the electricity prices in Republic of Serbia are currently among the lowest ones in Europe. The average price of electricity for households stands currently at 5,17 eurocents/kWh (without VAT)⁵, and for industrial customers at around 6,58 eurocents/kWh (without VAT)⁶. These tariffs are not considered as adequate, however, to attract new investments in the power sector.

7. In January 2013, the Government of Republic of Serbia adopted a new “Decree on Criteria for Privileged Power Producers” to provide a privileged power producer status to all operators using renewable energy sources for power generation as well as to those that perform activities in highly efficient CHP facilities, thereby providing some new opportunities for the increasing use of both CHP and the use of new renewable sources such as biomass in municipal DH plants. Co-operation in this respect will be sought, for instance, with the KfW supported baseline projects described in further detail in chapter 1.4.

8. The main electricity producer in Republic of Serbia is “Electric Power Industry of Serbia (Elektroprivreda Srbije - EPS)”. EPS was previously a vertically integrated public utility responsible for generation, transmission and distribution, but in 2005 was divided into two independent, although still 100% state owned entities: EPS continuing with the same name as before with responsibility on power generation, distribution, supply and power trade, and the new company EMS (Elektromreze Srbije) responsible for transmission and system operation. Distribution is in the hands of five regional distribution companies, which all belong to the EPS.

⁴ Source: UNPD/GEF project document “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”, 2014

⁵ Source: AERS Energy Agency, second half of 2013

⁶ Source: AERS Energy Agency, second half of 2013

9. As of 2013, the total net generation capacity owned and managed by EPS was 7,124 MWe, of which 3,936 MWe thermal power, 353 MWe Combined Heat and Power (CHP) and 2,835 MWe hydro power. The total power generation in 2013 was 37,433 GWh, of which 26,537 GWh by lignite fired thermal power plants, 167 GWh by CHP and 10,729 GWh by hydro. The import and export of electricity at the annual level are roughly balanced.⁷

10. Liberalization of the electricity market started in 2004, when all customers connected to high voltage transmission grid (total of 26 customers responsible for about 9% of the entire electricity demand of Republic of Serbia at that time) were forced to abandon the regulated tariffs and to sign supply contracts either with “EPS Supply” or with another supplier of the open market. Only few suppliers could compete with low EPS prices, however, and in the end only one customer decided not to sign a supply contract with the EPS.

11. On January 1st, 2014, another step towards full liberalization of Serbia’s electricity market was taken, when companies with over 50 employees, with annual income above 10 million euros and/or those connected to mid-voltage grid became subject to the scheme. This group consisted of about 3,200 customers accounting for some 25% of the total electricity demand in Republic of Serbia. By the end of April 2014, EPS Supply had signed electricity supply contracts with 2,900 companies, thereby remaining by far the largest electricity supplier in Republic of Serbia. For those companies that failed to find an electricity supplier, “a last resort supply” arrangement was applied, under the which the companies had the right to purchase electricity from EPS at a fixed price of 59,90 euros/MWh (without VAT) until June 30th, 2014, which was later extended until the end of 2014. Electricity market for households and small customers was liberalized at the beginning of 2015.

12. The total number of electricity customers in Republic of Serbia in 2013 was 3,628,028⁸, of which close to 90 % are household customers. According to data from Energy Agency of Republic of Serbia, the share of the residential electricity consumption raised from 41 % in 1990s up to 60 % in 2000, but after that came down again to about 55% in 2012 (IEA Energy Statistics 2012). In most EU countries, the share of residential electricity consumption is significantly lower. According to estimates, one third of the households in Republic of Serbia is using electricity for heating, complemented by another third, which is expected to use electricity occasionally for heating purposes. Together, they have been estimated to contribute to the annual electricity consumption by about 5 TWh for household heating purposes only.

13. The distribution losses are estimated at about 15 % of the total amount of electricity delivered. Technical losses are estimated at 8,5 %, while the rest (6,5%) is considered as non-technical losses. The debt, including unpaid electricity by both households and small companies with regulated prices, and large companies, which signed contracts on competitive market, stood at 110 million euros in 2014. The biggest debtors are the customers of the electricity distribution company “Jugoistok” from Nis. The bill collection rate on competitive market stands at 90 %, while the bill collection rate for customers entitled to last resort supply stands at 60 %. EPS has estimated that 60-80 million EUR (or about 1 TWh) of annual losses are directly due to the electricity theft.⁹

Role of Municipalities

14. The territorial organization of the Republic of Serbia is regulated by the Law on Territorial Organization. According to the Law, the units of the territorial organization are: municipalities, cities and autonomous provinces (Vojvodina and Kosovo). The Republic of Serbia (without Kosovo) comprises of 166 municipalities and 24 cities, of which 4 include several municipalities (Belgrade, Novi Sad, Nis, Pozarevac). Belgrade, as the capital and the largest city comprising of 17 municipalities, has a special status with its own legislation.

⁷ Source: EPS Technical Report 2013

⁸ Source: EPS Technical Report 2013

⁹ Source: Balkan Energy News, Country Report on Energy Business Serbia, June 2014

15. Municipalities are the basic entities of local self-government in Republic of Serbia. Each municipality has its assembly (elected every 4 years in local elections), the mayor, municipal council (executive bodies), and municipal administration. The assembly councillors (19 to 75 per municipality) are elected on the basis of a free, general and equal right to stand for election and by the direct and secret ballot.

16. Serbian municipalities differ much in terms of the territory (from 3 km² to 1,530 km²), population (from 1,600 to over 340,000), population density (from 5,3 pers/km² to 18.78 pers/km²) and economic strength. From all municipalities, 41% has population less than 20,000. The poorest municipalities are typically located in the border areas of South-West, South-, and East-Serbia with annual budgets below 2 million USD. The economically most developed municipalities are in and around the cities of Belgrade and Novi Sad. As geographical subdivisions of the national territory, municipalities encompass both urban and rural areas (for example, roughly 70% of the territory of the City of Belgrade is classified as rural). Under the local government law, municipalities have the authority to create subordinate units of administration (so called “mesna zajednica”) to serve parts of the municipality, including rural villages, but these are not independent legal entities. The municipalities themselves operate under the overall responsibility of the ministry in charge of public administration and local self-government.

Table 1.2: Population of Serbian municipalities¹⁰

Population of Serbian Municipalities in 2011				
Size Range	Number of municipalities	% of mun.	Population	% of pop.
>100,000	19	11.5	2,903,748	40.4
50,000-100,000	26	15.7	1,729,250	24.1
20,000-50,000	53	31.9	1,661,633	23.1
10,000-20,000	57	34.3	814,900	11.3
< 10,000	11	6.6	77,330	1.1
Total	166	100.0	7,291,436	100.0

¹⁰ Source: 2011 Census of Population, Households and Dwellings in the Republic of Serbia, First result, Statistical Office of the Republic of Serbia, Belgrade, 2011.

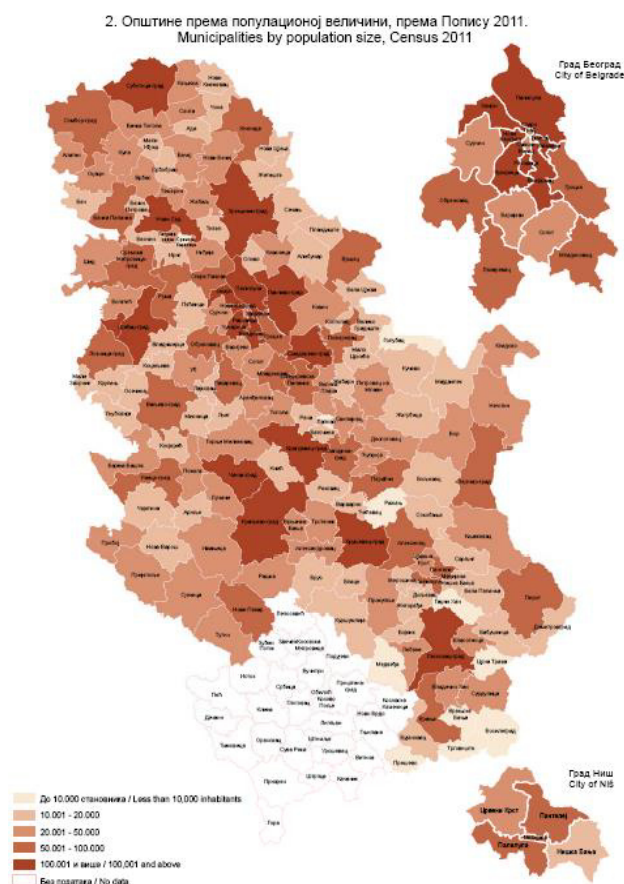


Figure 1.1 Map of Serbian municipalities by population in 2011¹¹

17. Territories with the status of "city" have more than 100,000 inhabitants, but are otherwise very similar to municipalities. Only, if the city includes more than two municipalities, competences of cities and their municipalities are divided. Municipalities and cities are gathered into larger entities known as administrative districts, which are regional centers of state authority, but have no assemblies of their own. They present only administrative divisions and host various state institutions such as funds, office branches and courts. Districts are not defined by the Law on Territorial Organisation. Republic of Serbia is divided into 29 districts (7 in Vojvodina and 17 in the rest of Serbia), while the city of Belgrade presents a district of its own.

18. The Law on Local Self-Government and the Law on Public Property provide the legal basis for the establishment of the local self-government's (municipal) competence over and management of the public property it possesses. All municipalities are founders of their public companies, of which some perform municipal utility services.

19. According to the Law on Local Self-government and the Law on Planning and Construction, municipalities apply the local economic and social policy, they can set some incentive mechanisms, they elaborate spatial, economic development and other plans, they issue municipal regulations and decide on investments in the municipal infrastructure, which can have far-reaching effects. They also set requirements and conditions and issue location, construction, operational and other permits (including some for energy facilities), as well as those for the performance of business activities.

20. Municipalities in Republic of Serbia have a broad range of responsibilities and competences. At the same time they are energy and water producers and suppliers (district heating systems, waterworks), energy consumers (public buildings, public lighting, water-supply and other municipal public companies),

¹¹ Source: 2011 Census of Population, Households and Dwellings in the Republic of Serbia, First result, Statistical Office of the Republic of Serbia, Belgrade, 2011.

as well as market regulators (heat market, municipal services, etc.). They are responsible for the regular and investment maintenance of public buildings (schools, kindergartens, administration buildings, health centers, sport centers, social care institutions, etc.) and public lighting, for which they pay the energy costs.

21. The Law on Energy stipulates a number of roles and responsibilities for municipalities and cities. The energy policy at the local level is expected to be implemented through the elaboration of local energy sector development plans and their adjustment with the national strategic documents. Besides, municipalities are obliged, within their responsibilities, to:

- provide data for the preparation and implementation of energy sector development strategies and for the annual Energy Balances as per the request of the Ministry in charge of energy;
- issue permits for heat production facilities;
- regulate local heat market;
- determine tariffs for billing the delivered heat;
- define requirements and procedures for acquiring the status of a privileged heat producer and criteria for meeting these requirements;
- keep a register of privileged heat producers; and
- elaborate energy development plans.

22. It is estimated that municipalities are directly responsible for and cover the cost of approximately 6% of final energy consumption in Republic of Serbia. In addition, being in charge of the local energy policy, heat market and municipal services, municipalities decisively influence up to 10% of final energy consumption in Republic of Serbia. On the top of this, the municipalities have a strong influence on the large share of final energy consumption in households and commercial activities. No detailed statistics on energy consumption of Serbian municipalities exist, but some rough estimates can be made by combining data from various sources, as illustrated in table 1.3 below.

Table 1.3 Approximated allocation of the public sector energy use in 2012 (without public transport)

Sector	Heating			Electricity used for other than space heating	
	TJ	GWh	kWh/m ²	GWh	kWh/m ²
Public and commercial sectors	27,690¹²	7,692	144	4,180	60
Street lighting				507 ¹³	NA
Other public utility services	3,579 ¹⁴	994		500 ¹⁵	NA
Public and commercial buildings, of which:	27,690	7,692	144	3,173	
Commercial buildings		2,600 ¹⁶	144	1,073	60
Public buildings		5,092 ²⁷	144	2,101	60

23. Energy-wise the most relevant municipal service is **district heating (DH)**. District heating systems with total installed thermal capacity of approximately 6,700 MW exist in 59 municipalities and cities and supply heat to approximately 24% of all households in Republic of Serbia. Households comprise 82% of the DHS users and the rest are commercial and public sector consumers. Heat is produced by using fossil fuels, primarily natural gas, followed by lignite and oil products. Sanitary hot water supply is served by district

¹² From MoME Energy Balance 2012 by assuming that all direct fuel use together with heat and 15% of electricity in the final energy consumption category "Others" is used for space heating of public and commercial buildings

¹³ EPS Technical Report 2012

¹⁴ Including own use and estimated losses of DH plants, as presented in the MoME Energy Balance 2012

¹⁵ Own estimate

¹⁶ In the absence of better information allocated based on the known floor space of each sector

heating systems only in few towns. With a few exceptions, DH services are managed by public utility companies (PUCs) founded by municipalities. In addition to DH, almost all municipalities own and manage block boiler plants, which supply several public buildings and, sometimes residential buildings in the vicinity of the plant. The efficiency of both types of heat supply systems is typically low. The systems are old, poorly maintained, often based on oversized heat only boilers and controlled manually resulting in significant energy losses both in production and distribution.

24. Price of the DH services is regulated by the local municipalities with a cap put by the Government on the maximum percentage of annual price increases. In general, the tariffs are not adequate to allow full cost recovery of the services provided since district heating is also considered as a social service. In most cases, the billing is still done based on a flat rate per m² of the heated area, although the DH companies are expected to gradually move towards consumption based billing, as required by the new energy efficiency law. The prices vary from town to town and depending on the type of customer.

25. A big energy saving potential for heating also exists at the demand side. The heat substations of the consumers are frequently without automatic control and heat metering. Much of the building stock in Republic of Serbia was built in the 1970's and 1980's or even earlier with brick walls and no other thermal insulation. Small autonomous boilers in apartment buildings (usually burning coal or fuel oil) are typically in poor condition and inadequately maintained. The internal heat networks may not be properly insulated and have non-operating or non-existing control equipment such as thermostatic radiator valves. A study published by World Bank in 2012¹⁷ indicated savings potential in public buildings, mainly schools and hospitals, in the order of 40% to 47%.

26. **Public lighting (PL)** is a municipal service provided by all Serbian municipalities. Although municipalities are solely responsible for the maintenance of the PL system, the responsibility of maintaining the low voltage electricity grid is with the local distribution companies. One of the important characteristics of the development of most of PL systems in Republic of Serbia in the past was that they were installed in smaller towns by financial contributions of the citizens, which is why modest technical solutions were applied. Very few municipalities have detailed records on their PL systems, therefore no regular monitoring of electricity consumption, operation of the system, maintenance and operational cost of the systems exist. Typically, only malfunction driven maintenance is performed. The total installed capacity of the PL systems in Republic of Serbia is estimated at about 100 MW. No integral data base on public lighting in Republic of Serbia exists, however.

27. It has been estimated that about 60% of public lighting is obsolete with inefficient lighting equipment. Energy savings of about 35% could be achieved by moderate investments i.e. by replacing the current incandescent and mercury light bulbs with more energy efficient high pressure sodium or metal halogen light sources and replacing the old inefficient reflectors with new ones. For new lighting systems, it would also be possible to apply advanced control systems to match the lighting intensity with the actual needs. Given the low price of electricity, installation of LED lamps has not been considered as economically feasible yet, but the situation may change in the future.

28. **Water supply** is a municipal service which exists in all Serbian municipalities. Municipalities are responsible for provision, operation, maintenance and investment into water supply and sanitation services. Municipal water supply and wastewater systems are operated and maintained by local public utility companies (PUCs), founded and managed by the municipalities. Billing is based on water consumption i.e. water and wastewater fees are charged for households and industries corresponding to their consumption of potable water. The fees cover the operation and maintenance costs inclusive of staff costs. They are calculated by the PUCs and approved by the municipal authority.

29. Although the situation in the water supply sector in meeting the current demand may be assessed as satisfactory, there is a need to improve the operation of the existing systems. Some parts of water supply network are very old and not up to modern standards, which is causing problems with operational reliability and water quality. Typically, water losses are very high, pressure control is poor and energy

¹⁷ National Building Energy Efficiency Study for Serbia, World Bank 2012

efficiency of the pumping facilities is low. Installed water meters are not calibrated regularly and not replaced as often as needed. Water meters are often missing or are deliberately removed or destroyed. In some municipalities illegal connections to the network exist. The collection rate is not satisfactory and a large discrepancy exists between the produced and billed water quantities. In general, there is a growing need to increase the efficiency of the water supply companies and introduce the demand side management i.e. to decrease the water consumption by different consumers. In that respect, water consumption in public buildings and public services is of particular relevance.

30. Another issue is that just slightly over half (51%) of all households are connected to public sewage water systems. At present, only 21 municipalities have operational municipal waste water treatment plants. The percentage of treated wastewater in 2009 was 15%.

31. The fourth significant energy related municipal service is **natural gas distribution**, although it is not regulated by the Law on Municipal Services. This activity is performed by municipal PUCs, but also by other companies. Out of 34 companies licensed for gas distribution, 20 are PUCs, of which the biggest ones are Srbijagas (City of Belgrade and 57 municipalities) and Yogorosgaz (City of Nis and 4 municipalities in southern Serbia). Usually, however, the PUCs distribute gas on the territory of one municipality only. The municipalities have a direct influence on the operation of the gas distribution system only, when the distribution is performed by the local PUCs. In all cases, however, the municipalities can influence the gas sector development by energy and spatial planning with an impact on the construction of new gas distribution networks and connection of new consumers.

32. In addition to the above, Serbian municipalities are performing several other services, typically by specific PUCs for each service, such as: public transport, municipal police (only in cities), waste management (collection, recycling, disposal), cleaning and maintenance of streets, roads, parks, green and recreational areas (served by different PUCs), funeral services and maintenance of cemeteries, management and maintenance of green markets, chimney sweeping services, organization of parking service and maintenance of public parking lots, etc. Some of these services can be quite energy intensive due to the use of a large number of vehicles and machinery. In addition, many municipal public entities (health centers, social care centers, veterinary centers, inspections, etc.) use and maintain their own fleet of vehicles and/or machinery, whose cumulative fuel consumption is significant. Except for large cities, which have invested significant resources in public transport fleet modernization, public transport vehicles in small municipalities are usually very old and poorly maintained. In particular, this applies for specialized vehicles and machinery, which are used by municipal services. Just keeping them in operation is the main challenge for many municipalities. In such conditions, energy efficiency and energy management of public transport or auxiliary transport services is not really gaining adequate attention.

33. Energy management is not yet systematically applied in Serbian municipalities. As defined by the ISO 50001:2011 standard on Energy Management Systems, an energy management system (EMS or EnMS) means “a set of interrelated or interacting elements of a plan, which sets an energy efficiency objective and a strategy to achieve that objective”. In essence, they help to identify where energy is lost, set feasible energy efficiency targets, prioritize measures to achieve those targets, leverage financing for them and monitor the results. An Energy Management Information System (EMIS) normally refers to a computer based system to collect, store and analyze information on the energy performance of the monitored objects, thereby being an essential part of a well established EMS.

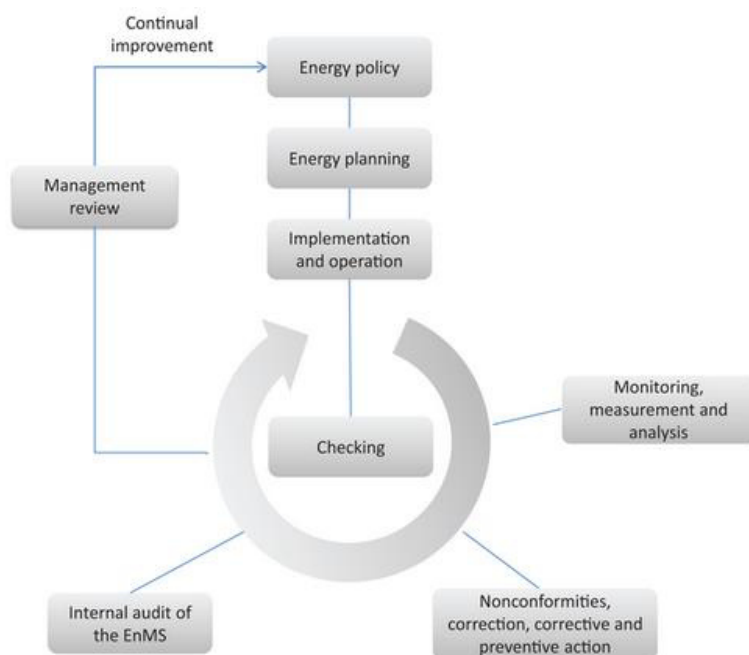


Figure 1.2 An Energy Management System model for ISO 50001:2011¹⁸

Building Stock

34. The majority of the residential building stock in Republic of Serbia has been constructed in 1945–1980. Construction of new apartment buildings slowed considerably in the 1980s and 1990s due to the difficult political and economic situation. According to the 2011 Census, the multi-apartment buildings made up only 3% of the total residential building stock in Republic of Serbia (for the number of buildings), but included 27% of all dwellings and close to 40% of the total residential floor area. From the municipal energy management point of view, the importance of multi-apartment buildings also lies in being more common users of the municipal heat supply services.

35. While the public sector buildings represent a significantly smaller share on the overall building stock than, for instance, residential buildings, they are among the least efficient ones of any building category. This provides a strong rationale for the project to focus on public buildings. Many public buildings were constructed 40 or 50 years ago. In most cases, the thermal properties of the building envelope, including walls and windows, are poor resulting in high heat losses and related heat demand of up to 350 kWh/m² per year. The heat generation systems in public buildings are typically outdated and inefficient without automatisisation and sufficient controlling opportunities. Sanitary hot water is usually produced by electricity. For lighting, many public buildings are still using inefficient incandescent light bulbs or outdated fluorescent tubes with inefficient starters. Municipalities are responsible for the maintenance of public buildings (schools, kindergartens, administration buildings, health centers, sport centers, social care institutions, etc.) and for which they also pay the energy costs. As such, any energy savings in those buildings will mean direct savings also in the municipal budgets.

36. Even in the construction of new buildings, the default heat demand is typically around 100 kWh/m², while in many other European countries with similar climate conditions, buildings are currently constructed with annual energy demand for heating, hot water and air-conditioning all together lower than 100 kWh/m² and with a stated target for EU countries to move towards “nearly zero-energy buildings” for all new buildings to be owned by public authorities by 31 December, 2018.

Policy framework

¹⁸ Source: <https://www.iso.org/obp/ui/#iso:std:iso:50001:ed-1:v1:en>

37. After the democratic changes in 2000, Republic of Serbia experienced a brief period of economic recovery with fast growth of the GDP and improvement of all macroeconomic indicators. In 2009, however, the still fragile economy was seriously affected by the world economic crisis and the period from 2010 to 2014 was characterised by negative macroeconomic trends. The biggest concerns are the long-standing, over 20% unemployment rate, high debt rate being 20% higher than the legal limit and high foreign trade deficit. In 2014, the economy was further damaged by massive floods resulting in sharp decline of the GDP and ending the year in recession. The high level of Government debt (currently 70% of the GDP) has made it more difficult for the government to climb out from the financial crisis. In such an environment, investments in energy-efficiency are often seen as a luxury, which cannot be afforded despite the fact that in the longer-term they can lead to significant cost savings.

38. All the current energy laws and policies in Republic of Serbia have been developed with the aim of harmonizing and integrating them with those of the European Union in accordance with the Energy Community Treaty signed in 2005. Republic of Serbia has been an EU candidate country since March 2012 and talks are ongoing concerning Serbia's possible EU membership. The Energy Sector Development Strategy of Republic of Serbia until 2015, which was adopted in 2005, was the first serious attempt to address the current and future problems in the energy sector and contribute to its development as a part of the EU integration policy.

39. According to the Law on Energy (initially adopted in 2004 and revised in 2011 and 2014), energy efficiency is an inherent part of the energy policy of the Republic of Serbia, pursued through the implementation of three strategic documents:

- The Energy Sector Development Strategy of the Republic of Serbia (ESDS);
- The Program for Implementation of the Strategy (POS); and
- The Energy Balance of the Republic of Serbia (Energy Balance).

40. Among the five priorities defined in the ESDS until 2015, the second one consists of specific programs for rational use of energy and improved end-use energy efficiency. For energy efficiency, the following programs were defined:

- Development of local natural gas networks to supply about 400,000 individual consumers in the building sector;
- Expansion of district heating networks for connecting 180,000 new consumers to existing and new heat sources;
- Introduction of technical measures for reducing thermal losses in buildings (residential and public buildings) and in thermal processes; and
- Gradual replacement of obsolete household appliances and organized replacement of incandescent light bulbs by new energy efficient ones with a target of 5 million lamps by 2015.

41. The finalization of the new Energy Sector Development Strategy for the period of 2015 - 2025 has been delayed due to the cancelation of the South Stream gas pipeline project in the end of 2014. The key priorities of the new Strategy are likely to remain, however, as follows: i) the provision of energy security; ii) development of energy market; and iii) overall transition towards sustainable energy sector.

42. Energy security implies reliable, safe, efficient and quality supply of energy and setting up conditions for reliable and safe operation and sustainable development of energy systems and energy sector in general. Developed energy market implies competitiveness on electricity and gas market based on non-discrimination, publicity and transparency, protection of energy consumers, further opening of the electricity and gas markets and their connection with the single EU energy market and improved connection of the Serbian energy system with the systems of the neighbouring and other countries. For the third priority, the most relevant steps towards sustainable energy sector are improvement of energy efficiency in all sectors of energy production, transmission and distribution, as well as in its end-use; creating favourable conditions for increasing the share of energy generated by renewable energy sources (RES) and by using CHP; improvement of environmental protection in all fields of energy related activities

and establishing of favourable legal, institutional and logistic prerequisites for investments in the energy sector.

43. Improving of energy efficiency in all energy related sectors is perceived as an overarching objective of the new Strategy. The Strategy particularly emphasizes the following strategic actions:

- Strong support to the implementation of the Law on Rational Use of Energy;
- Elaboration and implementation of National Energy Efficiency Action Plans, along with monitoring and verifying of achieved energy savings;
- Extensive use of CHP, especially in industry;
- Introduction of the Energy Management System (EMS) in industry and commercial sectors, as well as in public entities and municipalities;
- Improvement of energy statistics; and
- Informing and educating the public about the need to improve energy efficiency.

44. The Strategy is also envisaging two immediate priority actions: 1) Energy retrofitting of buildings and 2) Introduction of the energy management system in public sector.

45. Measures and activities necessary to reach the goals of the first Strategy were elaborated in detail in the “Program for Implementation of Energy Sector Development Strategy” (POS) for the period from 2007-2015, which was adopted by the Government of Republic of Serbia in January 2007 and amended later in 2009 and 2010. The POS comprises of 15 modules, each of which defines measures and activities necessary to be implemented in relevant sub sectors.

46. POS module no. 12 was addressing the final energy consumption. A number of legal, technical and organizational measures aimed at increasing energy efficiency were set, including: i) regulatory measures in compliance with the relevant EU Directives; ii) incentive mechanisms to be established by the ministries and institutions responsible for the concerned areas; and iii) technical and organizational measures in the industrial, transport and building sector.

47. POS module no. 13 was dealing with the Energy Efficiency Fund, including its legal setting and other topics concerning the operation of the Fund. Measures for improving energy efficiency of heat generation and distribution were elaborated in separate modules on City and Block District Heating Plants (POS module no. 10) and on Industrial Heat Plants (POS module no. 11).

48. Many measures foreseen by the first POS were, however, not implemented or implemented only partially such as the Energy Efficiency Fund. Elaboration of the new Program for Implementation of the Energy Sector Development Strategy will start after the adoption of the new Strategy for 2015-2025.

49. The Directive 2006/32/EC on Energy End-use Efficiency and Energy Services defined and set energy saving targets at the national level and required action by each Member State of Energy Community to reach a minimum annual energy savings target of 9% by the end of 2018. The Member States are also obliged to produce National Energy Efficiency Action plans (NEEAPs) in 2010, 2013 and 2016 describing national strategies, actions and measures taken to achieve this target. The new EU Energy Efficiency Directive 2012/27 currently being transposed by the Serbian Government and repealing the previous Directive 2006/32 is requiring the Member States, among others to:

- establish a long-term strategy for mobilising investment in the renovation of the national stock of the residential and commercial buildings, both public and private (article 4);
- ensure that, as from 1 January 2014, 3 % of the total floor area of heated and/or cooled buildings owned and occupied by the central government is renovated each year to meet at least the minimum energy performance requirements that it has set in application of Article 4 of Directive 2010/31/EU (article 5);
- encourage public bodies, including at regional and local level, and social housing bodies to: a) adopt an energy efficiency plan, freestanding or as part of a broader climate or environmental plan, containing specific energy saving and efficiency objectives and actions; b) put in place an

energy management system, including energy audits, as part of the implementation of their plan; and c) use, where appropriate, energy service companies, and energy performance contracting to finance renovations and implement plans to maintain or improve energy efficiency in the long term (article 5).

- ensure that central governments purchase only products, services and buildings with high energy-efficiency performance, insofar as that is consistent with cost-effectiveness, economical feasibility, wider sustainability, technical suitability, as well as sufficient competition (article 6);
- set up an energy efficiency obligation scheme for energy distributors and/or retail energy sales companies (article 7);
- promote the availability to all final customers of high quality and cost-effective energy audits (article 8);
- ensure that, in so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings, final customers for electricity, natural gas, district heating, district cooling and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use (article 9) and that the that billing information is accurate and based on actual consumption (article 10);
- carry out and notify to the Commission a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling (article 14);
- promote the energy services market and access for SMEs to this market (article 18); and
- facilitate the establishment of financing facilities, or use of existing ones, for energy efficiency improvement measures to maximise the benefits of multiple streams of financing (article 20).

50. The First National Energy Efficiency Action Plan of the Republic of Serbia for the Period from 2010 to 2012 was prepared and adopted by the Government of Republic of Serbia in July 2010. It contained 29 sectoral measures and 4 cross-sectoral (horizontal) measures. Similar to POS, however, most measures were not implemented or were implemented only partially. Therefore, Republic of Serbia was estimated to have achieved only about 1.2% of the 1.5% savings target established by the first NEEAP. This relatively weak result was due to the fact that 14 out of the 29 proposed sectoral energy efficiency measures relied on the Law on Rational Use of Energy and the Energy Efficiency Fund planned to be established under that. The law was initially expected to be adopted by the end of 2010, but this was only done in 2013 with a new title of "Law on Efficient Energy Use". The idea on establishing of an Energy Efficiency Fund was abandoned and replaced by an annual budgetary allocation only in the new version of the Law.

51. The Second National Energy Efficiency Action Plan for the period from 2013 to 2015 was prepared and adopted by the Government of Republic of Serbia in July 2013. One of the identified problems to facilitate its effective implementation is that monitoring and verification of the achieved savings remain as a serious challenge. Still no statistical data of sufficient quality are available to provide the basis for determining aggregated energy efficiency indicators for the targeted end-use energy sectors. On the other hand, applying a bottom-up methodology would require significant enforcement of data collection among the energy end-users.

52. The Law on Efficient Energy Use, adopted by the Serbian parliament in March 2013, calls for an energy efficiency program to be put in place by a designated organization, currently the Ministry of Mining and Energy. The national energy-efficiency programme shall include: i) planned energy savings target, which is in line with the targets specified in the Strategy, Strategy Implementation Program and Action Plan; ii) an overview and an estimate of the annual energy demand, including an assessment of energy performance of facilities; iii) proposed measures and activities that will contribute to efficient energy use; iv) responsible parties and deadlines for realization of the proposed measures; v) deadlines and assessment of expected results for each of the measures identified to achieve the specified target; and (vi) financial instruments (sources and methods to provide the funding) envisaged for implementation of the planned measures and activities.

53. In line with the provisions above, all municipalities with population above 20,000, or so called “designated municipalities”, are obliged to establish municipal energy management system. They are also obliged to elaborate Energy Efficiency Programmes for the period of three years and set the mandatory energy savings targets. The Programme shall be elaborated in details in the Energy Efficiency Plan for the period of one year. Designated municipalities are obliged to submit annual reports to the Ministry on their annual energy consumption and on achievement of their energy saving target.

54. In October 2014, the EU leaders agreed on new aggregated targets for the reduction of GHG emissions by at least 40% below the 1990 level by 2030 and for improved energy efficiency and share of renewable energy by at least 27% by 2030, which are to provide the basis for future EU energy policy.

1.2. Baseline, barriers and current government policy to address the root causes and threats

55. In Republic of Serbia, the energy issues at the local level are still not in the focus of attention and are overshadowed by what are perceived as more important issues in the energy sector. Serbian municipalities are facing many challenges such as drastic economic stagnation, obsolete technology, outdated infrastructure, loss of working places and a lack of credit worthiness, while at the same time having a shortage of capacity to perform the required public utility services such as the water-supply, district heating, public lighting and public transport, thereby putting many municipalities in a very difficult situation. As a result, most of them do not have adequate capacity to deal with energy issues they are supposed to be responsible for and are mainly preoccupied by meeting the ever growing energy demand and by covering the cost for energy, either directly in public buildings or through some form of utility services.

56. Extended jurisdiction of local self-governments mostly favours cities and larger municipalities, while many smaller municipalities are unable to carry out responsibilities assigned for them in a high-quality and efficient manner. This problem will become even more visible in the coming years due to the decrease of the population in small municipalities (an extreme case being the municipality of Crna Trava, which lost over 35% of the population between the last two censuses).

57. In the baseline scenario, several donors continue to support efforts to improve the energy efficiency of the Serbian economy, but to large extent these initiatives will remain inadequately co-ordinated and bypass the required implementation support at the municipal level. In the baseline scenario, UNDP will still transfer its energy management information system (EMIS) from Republic of Croatia to Republic of Serbia, but there will not be enough resources to carry out detailed training and capacity building at a level that is required for successful implementation of EMS and EMIS by Serbian municipalities. As a result, new EE related laws and regulations may be adopted and new financial support mechanism established by different donors, but in the absence of adequate information and capacity at the municipal level, they cannot be implemented and utilized to the full extent. A more detailed discussion about the complementarity of the proposed UNDP/ GEF project to other past, ongoing and planned initiatives in Republic of Serbia can be found from chapter 1.4.

58. The key barriers preventing the Serbian municipalities to improve their energy efficiency in line with the objectives of the new EE related laws, regulations and action plans and the available financing opportunities are briefly summarized below:

Table 1.3 Key Barriers to Energy-Efficiency in the Municipal Sector in Republic of Serbia

Barriers	Barrier Explained	Means of Overcoming Barrier
Legal and Regulatory Barriers	The new Law on Efficient Use of Energy creates a national energy-efficiency programme but does not go into detail about how this programme will be created and how it will be operationalized.	Assisting further development and updating of the required secondary legislation to support the implementation of energy management systems at the municipal level.

Information and Data Barriers	Lack of data concerning public sector energy consumption and losses, thereby making it more difficult to identify and justify the priority EE measures (and investments) to be undertaken.	Detailed surveys on municipal energy consumption at different end user segments will be undertaken and a proper systems to collect, monitor, and manage data (EMIS) will be established with institutional arrangements in place to facilitate its regular updating.
Institutional Barriers	Lack of continuity, clarity and co-ordination of the institutional responsibilities in improving energy efficiency of the municipal energy use and supply with institutional responsibilities split between various agencies.	The ministry responsible on energy issues will establish a central co-ordination and support unit to support effective implementation of EMIS at the municipal level. The municipalities will appoint energy managers and establish specific EE support units to manage EMIS and initiate and co-ordinate all EE measures at the municipal level.
Awareness, Knowledge and Capacity Barriers	Lack of awareness, knowledge and capacity among municipal staff (incl. PUCs) on the initiation and implementation of EMS, EMIS, and related follow-up EE measures for municipal energy use and supply.	At least 100 municipal and public officials will be trained on energy-efficiency throughout the lifetime of the project. Besides, by supporting EE related aspects of vocational training, the project seeks to ensure that the new professionals entering the labour market have state of the art knowledge and adequate skills to promote and implement different energy efficiency measures in their day-to-day work.
Financial Barriers	Lack of public funding and inadequate access to private sector funding to finance municipal EE investments.	By adopting and effectively implementing EMIS, the municipalities will obtain a strong tool for prioritizing and justifying the investments on the basis of credible and comprehensive information about the savings to be achieved. Besides, the project will train the municipal energy managers on the required financial analysis and financial structuring to select and present projects in a format that meets the requirements of the different financing entities.

1.3. Institutional Framework and Stakeholder Analysis

59. The responsibilities in the field of energy efficiency are defined by the Law on Energy of the Republic of Serbia. According to the Law, energy efficiency is an inherent part of the energy policy of the Republic of Serbia and the Ministry in charge for energy sector (currently the Ministry of Mining and Energy) is in charge for energy efficiency and use of renewable energy sources. The same Ministry represents Republic of Serbia in the Energy Community and is responsible for implementation of decisions of the Ministerial Council of Energy Community on behalf of the Government of Republic of Serbia.

60. Other ministries are involved in developing and implementing energy efficiency policies to the extent they are embedded into various sectoral policies. In addition, several other institutions can be listed, which have some role in implementing specific parts of energy efficiency policies or sectoral energy efficiency measures. A summary of the institutional framework relevant to energy efficiency, as of October 2014, is provided in table 1.4 below

Table 1.4 Institutional framework for energy efficiency in Republic of Serbia as of October 2014

Competences	Institution/Organization	Policy making – strategic level	Legal	Technical/ organizational	Implementation of the EEI measures
Level					
Primary	The Ministry of Mining and Energy (MoME)	*** Energy	*** Energy	*** Energy	*** Energy
Secondary	Ministry of Construction, Transport and Infrastructure		** Construction, Transport	** Construction, Transport	** Construction, Transport

	The Ministry of Agriculture and Environmental Protection		** Environment	** Environment	** Environment
	The Ministry of Finance		*	*	*
	The Ministry of Economy		*	*	*
	Line Ministry		*	*	*
	The Provincial Secretariat for Energy and Mineral Resources (PSEMR)	** Provincial level	** Provincial level	** Provincial level	** Provincial level
	Local self-governments	* Local level	* Local level	* Local level	* Local level
Tertiary	The Energy Agency (AERS)		*	*	
	The Agency for Traffic Safety (ATS)		*	*	*
	The Statistical Office of the Republic of Serbia (SORS)			*	
	Public Procurement Office (PPO)			*	
	The Institute for Standardization of Serbia (ISS)			*	
Other	Regional Energy Efficiency Centers in Belgrade, Nis, Novi Sad, Kragujevac and Kraljevo and Serbian Industrial Energy Efficiency Network (SIEEN)				*
	Serbian Chamber of Commerce (PKS)			*	*
	Standing Conference of Towns and Municipalities (SCTM)			*	*
	Serbian Chamber of Engineers (IKS)			**	*

61. The main problems and deficiencies (also connected to the identified risks of the proposed UNDP/GEF project) of the institutions dealing with energy efficiency were assessed as a part of the baseline analysis of the project. As specific institutional challenges to energy efficiency in Republic of Serbia, the following, among others, can be listed:

- Only few municipalities and big cities have some form of energy management, but it is mainly focused on the production side with little influence on the demand side energy consumption and the use of municipal services. The main driver is the need to provide technically reliable supply of energy and municipal services. Therefore, demand side management is rarely considered with the exception of eventual single activities and/or superficial public campaigns. No consistent, systematic and lasting energy efficiency programme for any category of energy end-users exists. Although in some municipalities efforts towards that direction have been made (such as Novi Sad), the agency established for energy management was understaffed with small operational budget, which could hardly cover the daily work. In addition, the work of such agencies is very vulnerable to any future political changes.
- It is also typical that the technical and financial aspects of energy management as well as the purchase of energy from the provision of a municipal service and/or from the maintenance of the utility systems and public buildings are separated from each other. The energy purchase and payment tasks are transferred to the financial department, while the personnel who are directly dealing with the operative work and who have a direct insight into the operation of energy facilities or public buildings do not have sufficient influence on financial issues. In such conditions, energy efficiency considerations both at the production side, i.e. with the municipal utility companies and at the consumption (public or private) side, have been put aside;
- No systematic data collection on energy consumption and energy cost exist in most municipalities, thereby leaving the municipal decision makers without an adequate basis for setting up local

energy policy and targets regarding energy savings and use of renewable energy. This situation substantially affects the organization and the activities of the existing energy management in municipalities. Until now, no municipality has established energy management system fully in line with the Law on Efficient Use of Energy;

- In conclusion, all large cities and municipalities still don't have adequate organizational structure and staff to implement energy management systems the way it is envisaged in the Law. The existing systems in some cities such as Belgrade, Novi Sad and Nis need to be improved and additional resources are required for their operation. Other municipalities are at the very beginning and need first to establish separate units within their administrations to deal with energy management and after that need to be capacitated to perform the required tasks; and
- Although positive results have been achieved in some smaller municipalities such as Vrbas and Varvarin, these examples also reveal the main deficiency of the current institutional framework: The achievement of results depends too much on the quality of individuals and their individual efforts. The modest results of large municipalities in relation to their capacity show clearly that their fully established administrative systems are rigid and bureaucratic. A motivated individual in a small municipality, on the other hand, can easier get backing for his/her initiatives and the rest relies on his/her creativity and effort. When achieved, results are obvious and individually praised.

62. Smaller municipalities often show bigger interest in energy efficiency, which could be explained by several reasons:

- Budget structure of smaller municipalities is simpler, hence the relatively high costs of energy are more visible;
- Budget of small, and poor, municipalities is stretched to the limit, therefore opportunities for savings will be considered more carefully;
- A number of donors were active in small municipalities. They trained municipal officers how to collect and interpret data on energy consumption and prepare municipal energy efficiency project proposals. Many donors have also financed a number of such projects;
- Municipal officers who passed trainings for energy management have less internal administrative hurdles to deal with data collection and preparation of energy efficiency projects;
- Experienced and skilled municipal officers have relatively straight forward communication with municipal decision makers and hence eventually more backing for their initiatives, provided that the decision makers and mayors understand the topic.

63. As illustrated above, the institutional challenges for effective introduction of municipal energy management and information systems and their use to actually improve the energy efficiency of municipal services and the demand side are significant, manifold and complex. They are not, however, impossible to overcome step by step, if adequate and broad political support from the key stakeholders can be ensured and adequate number of municipalities is found, where both the management and the operational staff are motivated to champion EMS and EMIS and provide a precedent for others to follow. Keeping in mind that proper energy management calls for a systematic approach, the project needs to emphasize the need for the establishment and operation of flexible and to the existing system well integrated, municipal energy management offices ensuring continuity and providing the required stability over the elections and related day-to-day politics.

1.4 Baseline Projects and Other Related Past and Ongoing Activities

64. Several donors have supported and continue to support the development and implementation of energy efficiency policies and action plans in Republic of Serbia, including both technical assistance and establishment of new specific purpose credit lines. Many of these activities are also directly or indirectly supporting (in one form or another) the introduction and implementation of municipal energy management and information systems, but not always with adequate co-ordination in place. The following paragraphs provide an overview of the achieved and/or planned results of these "baseline

projects” in the context of each UNDP/GEF project outcome, to which these projects can be seen to primarily contribute. A more detail discussion on the project strategy and its complementarity to other past and/or ongoing activities can be found from chapter 2.1. There are no other ongoing GEF funded projects in Serbia with a particular focus on energy-efficiency.

Outcome 1: An enabling legal and regulatory framework to support adoption and effective implementation of municipal energy management systems and related energy efficiency measures

65. EU-IPA “Preparation of Second Energy Efficiency Action Plan and Development of Energy Indicators”: The project was initially prepared for supporting Serbia with the preparation of the second Nation Energy Efficiency Action Plan (NEEAP) with EU-IPA funding of EUR 2 million. Since the second NEEAP was finalized already before the project start, however, the project is currently geared to support the preparation of the third NEEAP. The stated overall objective of the project is to support the current Serbian Ministry of Mining and Energy “in successful implementation of Energy Community Treaty requirements with the main goal to support sustainable development by creating an action plan and building capacities to advance energy savings and energy efficiency measures that will contribute to reduction on energy consumption and CO₂ emissions“. The specific project components include:

- Comprehensive study on energy consumption in residential, commercial and public services, agriculture, transport and industry sectors in Republic of Serbia, including the design and development of a database and related surveys and data analysis to fill the database with information on energy consumption of the surveyed sectors and their energy performance indicators; and
- Energy Efficiency Action Plan

66. The MoME is currently preparing a proposal to request support from EU-IPA for the preparation of the still pending secondary legislation for the implementation of the Law on Efficient Energy Use.

67. The UNDP/GEF project under component 1 will complement the activities described above by identifying and analysing the remaining legal and regulatory gaps and the related updating needs to support the adoption and effective implementation of municipal energy management systems in Republic of Serbia.

Outcome 2: Central and municipal energy efficiency support units are established and operational and their capacity is built to establish energy management systems at the municipal level

68. Norwegian bilateral assistance to energy efficiency was a multi annual, 2.08 million EUR programme funded by the Ministry of Foreign Affairs of the Kingdom of Norway, with Serbian Energy Efficiency Agency (phase I) and Ministry of Mining and Energy as its implementing partners. The specific activities implemented in several phases in 2002-2009 (on which, to some extent at least, also the TA activities of the UNDP/GEF project can build on), included:

- Advisory to MoME on energy policy issues, especially on the development of the Serbian Energy Policy Document and Energy Strategy;
- Complementing the initial support of the European Agency for Reconstruction (EAR) for the establishment and operation of Serbian Energy Efficiency Agency (SEEA) by facilitating transfer of knowledge between Norway and Serbia and, in particular, supporting the establishment of four regional energy efficiency centers (REEC) by relying on experts from the mechanical faculties at the Universities in Novi Sad, Belgrade, Kragujevac and Niš;
- Transfer Norwegian EE experiences to Serbian industry and universities. Two projects were implemented to transfer energy efficiency knowledge to Serbian experts from the mentioned four regional energy efficiency centres and from selected industrial companies. The programmes focused on project development, how to secure financing for energy efficiency projects, practical energy management applied to food industry and implementation of energy management systems in accordance with relevant European standards and directives; and
- Assistance in developing small RE (hydro) power projects both with respect to technology and financing opportunities, including training and capacity building on CDM

69. In 2007-2009, the activities included support for the establishment of local energy management systems, including: i) a guidebook for elaboration of municipal energy balances, including development of an excel based software tool, and another guidebook for the preparation of the municipal energy efficiency projects; ii) training of representatives of 95 municipalities on data collection and elaboration of the energy balance at the local level; iii) local energy balances prepared by 46 municipalities together with EE project proposals; and iv) establishment of a database of municipal energy indicators.

70. As concluded by the final report of the Norwegian support in 2002-2009: Although Norway invested significant resources to support energy efficiency in Republic of Serbia, the results lacked continuity. After seven years of the first trainings of municipal energy managers, Republic of Serbia still had no municipal energy management system established. For systemic changes in all sectors much longer intervention period is needed. The GTZ Assistance to Republic of Serbia for “Planning for Sustainable Municipal Investment in the Area of Rational Use of Energy”, which was building on the methodology and materials developed under the Norwegian project and a joint project with GTZ on “Strengthening of the Local Self-Government” in 2010 were providing some continuity on these activities, but in 2014 there were still just 4 municipalities, which had taken energy management and information systems in some form into use. Insufficient support of local level management was mentioned as one reason for this. “Without this support, even with the exceptionally trained local energy managers, the process could not be continued. The status, motivation and resources of the local energy managers represented a flagrant problem.”

71. Similar challenges and risks, as described above, can be expected in the proposed UNDP/GEF project, although these may have been significantly reduced by the new Law on Efficient Energy Use making it obligatory for so called designated municipalities (for further details, see chapter 2) to appoint energy managers and to introduce energy management systems. The project tries to further reduce these sustainability related risks by setting certain prerequisites for the municipalities wishing to benefit from the UNDP/GEF project support, which are to be met by the municipalities before the project support in the form of technical assistance, hardware or other forms of support for capital investments can be provided. These are discussed in further detail in chapters 2.1 (under Outcome 2) and 2.7.

72. **UNDP – Energy Management Information System in Municipalities (EMIS):** Following the presentation organized by UNDP in the Ministry of Infrastructure and Energy (MIE) in January 2012 about the EMIS system developed and implemented under a UNDP-GEF project in Croatia (see the next paragraph for further details), the MIE expressed its interest in receiving this software also for Serbia. UNDP accepted to donate the database and related software, provided that the Republic of Serbia contributes with the amount of approximately US\$ 45,000 to the procurement of IT equipment, technical assistance for installation of the system by its developers and testing in pilot municipalities. These funds were planned in the budget for 2013 and a cooperation agreement was signed in 2013.

73. **UNDP/GEF Croatia project “Removing Barriers to Energy Efficiency in the Residential and Service Sectors”** finalized in 2011 with the focus on the adoption of municipal energy management systems (EMS) and energy management information systems (EMIS), as a part of that. The project was finalized as highly successful initiative and together with complementary efforts and financing by the Government of Croatia did manage to facilitate the adoption of EMIS by over 100 Croatian municipalities and counties, together with the appointment of energy managers and establishment of municipal energy efficiency offices. The EMIS software developed in the frame of the project also provided the basis for this new UNDP/GEF project in Republic of Serbia, as described in the previous paragraph. Some key observations and lessons learnt from the introduction of EMIS in Croatia are described in Annex 8.6 of this project document.

74. **Japan International Co-operation Agency (JICA)** has been active in Republic of Serbia in supporting the introduction of energy management systems through two particular projects. The first project implemented in 2009-2011 in the frame of JICA Technical Cooperation for Development Planning was a study to recommend necessary legal framework and action plan for the introduction of the energy management systems in Republic of Serbia, which recommendations were later incorporated into the Law on Efficient Use of Energy, enacted in March 2013. The specific components of the project included:

- Design of the Energy Management System in Republic of Serbia including hierarchical structure, responsibility assignment matrix, definition of designated consumers, qualification system for energy managers, training program for energy managers and by-laws necessary for defining details of the energy management system;
- Roadmap and action plan for introduction and implementation of Energy Management System;
- Recommendations on practical role of energy managers and their training program;
- Recommendations on other measures to promote energy efficiency; and
- Capacity development of MoME and relevant organizations through actual implementation of the Study.

75. The JICA study identified three already existing EMS database systems, namely SEEA's Energy Database (not existing anymore after the abolishment of the SEEA) and SIEEN's Benchmark Database established with support of the EU and the Norwegian Government and the MoME's Database for Energy Balance with component for collection of geographical information Geographic Information System – Database operated and maintained by MoME, but not including any energy consumption data at the moment when the Study was prepared.

76. About the training programs the JICA study concluded that “the existing training system for EE&C has been developed and implemented by SIEEN and REEC with the assistance of the EU and the Norwegian Government. The training programs with certification examination have been provided to factory engineers and municipality staff in the system. The programs cover comprehensive contents from basic theory to individual technology in EE&C and spend 1 to 4 days in the classroom.” Furthermore it was concluded that: “Through the implementation of the aforementioned system, lecturers and textbooks have been matured in SIEEN and REEC. Basic programs in the training system for Energy Management System have been already developed, so the study can focus on a training program for specific themes of the Energy Management System.”

77. The following steps were listed by the JICA study as essential elements of introducing and implementing municipal energy management systems:

- Collecting data via questionnaire and monitoring energy consumption and energy costs in public consumption facilities, as well as in other facilities on the energy demand side;
- Preparation of the municipal energy balance in accordance with the recommended or prescribed methodology;
- Preparation of the municipal energy plan in accordance with the recommended or prescribed methodology; and
- Identification of energy saving possibilities and preparation and execution of energy-efficiency projects and the use of renewable energy sources in the public consumption sector.

78. While certain parts of the JICA study may remain outdated, such as inclusion of SEEA (abolished in 2012) as one of the key entities in the organisational chart of implementing EMS, there are others that can still be used as a basis for launching energy management systems for industrial facilities and municipalities. Those applicable parts have been taken into account and addressed in the design of this UNDP/GEF project.

79. The second project "Project for Assistance of Enhancement of Energy Management System in Energy Consumption Sectors in the Republic of Serbia" (hereinafter referred to as the "Project") has been jointly implemented by MoME and JICA since March 2014. The project aims at introducing and implementing an Energy Management System (EMS) stipulated in the Law on Efficient Use of Energy by supporting human resource development and institutional capacity building. The project consists of the following subcomponents:

- To assist the scheme design for the secondary legislation of EMS;
- To assist preparation of training programs for Energy Managers (EM) and Energy Auditors (EA)

- To assist establishment of a training organization (TO), which will be officially appointed by MoME as the main executing agency of official training programs including practical training using the training facilities;
- To install the training facilities within the training center (TC), which is an operator for the training facilities for the official training programs;
- To assist the implementation of EMS and review the first year's activities.

80. The total size of the JICA project to support the activities discussed above during 2014 – 2016 is expected to reach 1 million Euros. Although implemented as a stand-alone project managed by JICA, the mentioned support can also be considered as complementary grant cash co-financing to the UNDP/GEF project by working towards the common goal of broad introduction and effective implementation of energy management systems in Republic of Serbia across all the main energy consuming sectors. While the activities of JICA will primarily focus on supporting training of energy managers from the industrial and commercial sectors, many JICA supported activities can be seen to directly enhance the opportunities and provide facilities for also training municipal energy managers supported by the UNDP/GEF project.

81. **German Federal Ministry of Economic Cooperation and Development (BMZ)** provides assistance to the region of South-East Europe (Serbia, Croatia, Bosnia and Herzegovina, Montenegro, Albania and Kosovo) through the bilateral projects in each country, as well as through the Open Regional Funds (ORF), both implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

82. All projects within ORF support the implementation of the relevant Stabilization and Association Agreements with the EU or promote compliance with the Acquis Communautaire (EU Acquis). Energy efficiency (EE) is one of the four priority areas of cooperation. The project titled "Regional Exchange for Developing Energy Efficiency Platforms" has three components: 1) Capacity building for monitoring, verification and evaluation of the energy efficiency policy in SEE countries in terms of the EU accession process (M&V&E), including development of the clear and transparent methodology monitoring and verification of energy savings resulting from implementation of energy efficiency measures foreseen by NEEAPs; 2) Reporting on the results of implementation of the First NEEAPs by using bottom-up methodology; and 3) Integrated monitoring and verification platform (MVP) for NEEAPs implementation, including development, testing and commissioning of the special software tool aimed at establishing NEEAP monitoring and verification platforms at the national level in all countries of the region. The platform provides the ground for reporting the implementation of NEEAPs, both at the national as well as at the regional level. The ORF EE also promotes the Network of Energy Efficient Capital Cities in South East Europe with participation of Zagreb, Sarajevo, Podgorica, Skopje, and Tirana. Belgrad does not participate in this project, however.

83. The GTZ bilateral cooperation in the energy efficiency field supported two projects in 2005-2010:

- "Modernization of Municipal Services" (2005-2008) with the focus on small scale investment projects in the field of energy efficiency, water provision and waste management, and
- "Strengthening the Local Self Government" which was mostly oriented to capacity building of Serbian municipalities for sustainable investments in municipal infrastructure (energy efficiency, water provision and waste management) in terms of planning and designing.

84. Both projects had a large component to promote municipal energy efficiency. Within the first project GTZ co-financed some 16 municipal EE investments, such as modernization of public lighting system, EE retrofits of public buildings and DH substations totalling approximately 1 million EUR. As a part of the second project, GTZ supported energy audits in several public buildings and elaboration of the planning and design documents of 17 municipal energy efficiency projects. The capacity building activities focused on training of municipal energy managers for the elaboration of municipal energy balances and the preparation of municipal energy efficiency projects by continuing the support provided earlier by the Government of Norway. In total, representatives of 103 municipalities were trained on data collection and the elaboration of energy balance on a local level and 60 municipalities developed their local energy balance along with municipal energy efficiency project proposal. With the exception of few municipalities, however, this has not been systematically followed up.

85. In 2011-2016, the GTZ/GIZ bilateral support in the EE field has focused on developing and strengthening the institutional and legal framework, raising the awareness of the population and creating prerequisites for the development and application of state-of-the-art EE technologies in buildings. In the period of 2008-2010, the project was operating under the title “Energy Efficiency in Households” and implemented by a private consulting company. In 2011, the project was extended until 2016, renamed to “Advisory Services for Energy Efficiency in Serbia” and transformed for direct GIZ implementation in partnership with the Ministry of Mining and Energy and the Ministry of Construction, Transport and Infrastructure. The project activities include the following:

- In 2010 and 2011, the GIZ supported the drafting of two by-laws to complement the Law on Planning and Construction, namely: i) the Rulebook on Energy Efficiency of Buildings and ii) The Rulebook on Conditions, Content and Manner of Issuing Energy Certificates for Buildings;
- Advisory services on energy efficiency for Serbian institutions, such as the Serbian Chamber of Engineers, Faculty of Architecture, etc.;
- Awareness-raising of the population about the importance and need for implementing EE measures, among others, by showing images of buildings taken by infrared cameras and comparing those with images taken by standard cameras;
- Developing a national building typology (Typology Approach for Building Stock Energy Assessment) in line with the European TABULA concept (www.building-typology.eu) with the expert team from the Faculty of Architecture in Belgrade for the residential building stock.
- Development of Data Management System. GIZ EE provided support to the Ministry in charge of construction to develop a web application along with national database of issued energy efficiency certificates for buildings. The developed software is still in its testing phase, however.

86. The **EPS 500 million Euro investment program** (or 80 million for the first phase) to procure and install smart electric meters facilitating two-way communication system with remote reading of electricity consumption and its parameters, thereby providing technical grounds for wide use of automatic monitoring and controlling systems, including EMIS. The estimated time frame for replacing all meters is 7 years, starting in 2015.

87. The electricity and gas distribution companies typically have the most detailed databases on electricity and gas consumption of every single buyer. Hence, one of the first steps in introducing the EMIS in public buildings should be to facilitate access to that data (preferably automatically) based on an agreement with those distribution companies. This will be followed up by the UNDP/GEF project management at the project inception phase.

Outcome 3: At least 10 projects demonstrating the use of EMS and EMIS for identifying, prioritizing and leveraging financing for municipal EE investments and other related EE measures are successfully implemented with reported results for their first year of operation.

88. **The Ministry of Mining and Energy of Republic of Serbia** is managing a national EE budget fund with an allocation of 180 million dinars (about USD 1.7 million) for 2015 and which can co-finance public sector EE projects with up to 15 million dinars (about USD 140,000) and up to 70 % of the total projects costs. The annual budget allocations and funding levels are decided on an annual basis together with the other budget planning.

89. **KfW Municipal Environmental Grant Loan Investment Programme (MEGLIP)** supporting investments in energy efficiency and environmental measures of municipalities through long-term financing, investment incentives and technical assistance and consisting of 3 credit lines disbursed through local banks with total amount of 65 million Euros. Renewable and energy efficiency projects with energy savings of at least 20% (or projects with significant “environmental benefits”) are eligible for funding and may include, among others, projects on EE improvement of public buildings, district heating systems, sewerage, waste water, solid waste, street lightning and public transport. Available financing includes soft loans with a maturity of up to 10 years and a complementary investment grant (funded by EU IPA) of 15% for EE and RE projects and 20% for other environmental projects. In addition, the project can provide

technical assistance for partner banks to increase their internal capacity to evaluate and finance EE and RE projects and to municipalities to develop eligible projects.

90. **EU/EBRD Western Balkans Sustainable Energy Financing Facility (WeBSEEF)** with a credit facility of 92 million Euros able to finance private sector EE and RE investments by loans up to 2 million Euros (complemented by financial incentives i.e. grant of 5–10% of the loan amount) and municipal EE and RE investments by loans up to 2.5 million Euros (complemented by financial incentives of 10–15% of the loan amount). Other eligibility criteria include energy savings or CO₂ reduction of at least 20% from the initial level (for building EE measures at least 30%) and for renewable projects a simple pay-back period below 15 years at the time of the approval. For municipalities typical investments include: Replacement of old and low efficient lighting, window/door replacement, thermal insulation of the building envelope (external walls, roofs, basements), rehabilitation of existing heating (thermal insulation of pipes, tanks and machinery equipment, rehabilitation of street lighting (only measures relevant to improvement of energy efficiency), rehabilitation of air-conditioning/ventilation system, on site co-generation/tri-generation, replacement of existing boilers with more efficient ones (e.g. condensing boilers) or due to fuel switching, rehabilitation of heat distribution systems including implementation of heat control and measurement measures, implementation of solar thermal collectors and implementation of building management systems. Eligible borrowers for the public sector loans include municipalities, public or private companies delivering municipal services and directly responsible for the implementation of the investments or Energy Service Companies (ESCOs) implementing energy efficiency investments in co-operation with one or more municipalities or public companies.

91. All initiatives described above are highly complementary to the proposed UNDP/GEF project by being able to finance projects identified and developed through the effective use of municipal energy management and information systems.

92. *Outcome 4: Municipal Energy-Efficiency Charter signed by over 80% of all municipalities in Republic of Serbia, enhanced public awareness and improved local capacity to implement and manage investments in energy efficiency.*

93. While several activities to promote energy efficiency in various sectors have been implemented in Republic of Serbia over the past several years, to some extent they have lacked the continuity. In this respect, the proposed UNDP/GEF project will make a systematic effort to build on the results of the previous projects funded by other donors as well as on the experiences and lessons learnt from the first 30 municipalities planned to be supported under Outcome 2 and to bring those results one step further by encouraging the adoption and effective implementation of EMS and EMIS by all Serbian municipalities. Besides, the project activities under Outcome 4 will focus on enhancing the general public awareness on energy efficiency, facilitate access to complementary training and training materials to energy managers and build up the knowledge and skills of the students in the vocational schools to promote and implement new EE technologies in their later professional life.

94. No distinct baseline project can be pointed out for the planned activities under outcome 4, but they will largely build on the projects already discussed under Outcome 2. Besides, the activities under Outcome 4 will build on the ongoing outreach and networking activities of the Standing Conference of Towns and Municipalities (SCTM) with the Serbian municipalities.

2. PROJECT STRATEGY

2.1. Project Objective, Outcomes and Outputs

95. The project objective is to introduce and support the implementation of municipal Energy Management Systems (EMS), including Energy Management Information Systems (EMIS), throughout Republic of Serbia to increase the EE investments in public buildings and municipal services and to facilitate their more energy efficient operation in general. While the minimum project target by the end of the project is to have at least 30 Serbian municipalities to formally adopt and start the implementation of EMS and EMIS, the project also seeks to facilitate their replication in other Serbian municipalities. This possibility for scaling up the target will be further explored during project implementation, also by taking into account the prospects for leveraging additional funding for the effort.

96. For actual energy efficiency investments, energy saving and related GHG reduction, the project has set targets by the end of the project:

- to leverage at least USD 15 million for new EE investments by successful introduction of EMS and EMIS in Serbian municipalities;
- energy savings of at least 26 GWh (94 TJ) per year or 390 GWh (1,400 TJ) over the default lifetime of 15 years from the investments and other measures facilitated by the adoption and implementation of EMS and EMIS in at least 30 Serbian municipalities; and
- related direct GHG reduction potential of 10 kilotons CO_{2eq} per year or of 150 kilotons CO_{2eq} over the default lifetime of 15 years of the investments and other measures undertaken.

97. The indirect GHG reduction impact of the project has been estimated from 2 up to 3.9 million tons of CO_{2eq} depending on the calculation methodology used. For more detail calculations and related assumptions, a reference is made to Annex 8.5 of the project document

98. The project strategy is presented by a logical framework approach. The essence of this approach is that outputs are clustered by outcomes, which together will achieve the project objective. These are discussed briefly below, with further details in Section 3, “Project Results Framework”.

99. The incrementality of each component has been initially discussed in chapter 1.4 in the context of the listed baseline projects and is further elaborated below. In defining the project strategy, the experiences and lessons learnt from promoting the adoption of the EMS and EMIS in Croatia in the frame of the UNDP/GEF project “Removing Barriers to Energy Efficiency in the Residential and Service Sectors” concluded in 2011 have been taken into account, when applicable. Similar to the mentioned Croatia project, however, the project success in reaching its stated targets at the objective and outcome level will ultimately depend on the adaptive management skills of the project management to reflect the changing project environment, new emerging opportunities and often unpredictable challenges that are faced during the implementation of the project. Therefore, while the overall project objective and targets at the outcome level should remain similar to those defined in project’s strategic results framework in chapter 3, the specific outputs and activities will be subject to constant monitoring and evaluation of their relevance and to adaptive management during project implementation, when and as needed.

Outcome 1: An enabling legislative and regulatory framework to support adoption and effective implementation of municipal energy management systems and related energy efficiency measures.

100. The EU Energy Efficiency Directive 2012/27 currently being transposed by the Government of Republic of Serbia does not mandate, but is just “encouraging” public bodies to adopt an energy efficiency plan and an energy management system, including energy audits, as a part of the implementation of their plan.

101. The Law on the Efficient Energy Use adopted in March 2013, on the other hand, is obliging all municipalities with population above 20,000 (or so called “designated municipalities”) to establish municipal energy management systems. The law does not have the required secondary legislation developed yet, however, such as:

- the Rulebook on Detailed Conditions for the Assignment of Energy Managers According to the Type of Designated Organisation;
- the Decree on Defining Planned Energy Savings on Annual Level, Thresholds for Designated Organisations along with Application Form on Achieved Energy Consumption;
- the Rulebook on the implementation and content of the program of theoretical and practical training for energy managers, taking exams, training and examination fees; and
- the Rulebook on the conditions in terms of personnel, equipment and facilities of the training organization for training individuals for energy managers and accredited energy auditors.

102. While the harmonisation of the Serbian legislation with the EU Acquis is providing the general framework for practically all the current legislative work in Republic of Serbia (including energy related legislation), the project activities under component 1 will focus on:

- identifying and analysing the remaining legal and regulatory barriers to the effective implementation of energy management systems at the municipal level;
- making recommendations (including drafting of suggested amendments and/or new regulatory acts) for the removal of such barriers;
- facilitating their adoption by supporting required impact assessments and organising meetings and consultation with the key stakeholders affected by the suggested changes or influencing the process otherwise;
- assessing the level of enforcement of the adopted laws and regulations as it concerns the implementation of EMS and making recommendations for strengthening the enforcement; and
- developing and facilitating, as applicable, the adoption of voluntary norms and minimum energy performance and environment standards in municipal administration and public services with links to “green office” “green public procurement” and “smart city” initiatives exceeding the minimum legal and regulatory requirements at the national level.

Outcome 2: Central and municipal EE support units are established and operational and their capacity is built to establish energy management and information systems at the municipal level

103. Component 2 of the project is at the core of what the project aims to achieve as it will provide the framework and practical tools for developing and implementing energy management at the municipal level with the focus on public buildings and such municipal services, where opportunities for energy savings are the greatest. It is also to be recognized that the establishment of sustainable municipal energy management and the supporting institutional mechanisms should be considered as a multidimensional process of change over several years rather than a single output or activity.

104. The Law on the Efficient Energy Use is obliging all municipalities with population above 20,000 to establish municipal energy management systems, but until now only 5 municipalities have adopted an EMS of some kind. Although obligatory, it can be expected that also later the level, at which those systems will be established is going to greatly differ from one municipality to another.

105. The project activities under component 2 will facilitate the implementation of EMS at a coherent, high quality level and in line with international standards (see paragraph 33 for further details) by all municipalities confirming their interest to do so. As an elementary part of that, the project will support the establishment of municipal EE offices (in the form applicable for each municipality by taking into account its size and other specific characteristics) and to build up their capacity to define energy efficiency targets and strategies to meet those targets, to effectively implement those strategies and to monitor the results. Support will also be provided to smaller municipalities, which are not subject to the EE law requirements, but which may wish either alone or jointly with other small municipalities to adopt and start the implementation of EMS and EMIS.

106. Immediately after the project start, an adequately staffed central Energy Management Support Unit within the ministry responsible on energy will be created in order to support the municipalities to establish municipal EE support units and to start the implementation of municipal energy management.

After this, the project will initiate, in co-operation with the Standing Conference of Towns and Municipalities (SCTM), a series of awareness raising and training events and consultations informing the municipalities on the components and characteristics of well established EMS and EMIS, their benefits to the municipalities and the support available by the project to establish such systems, thereby emphasizing the need to raise the awareness of the key municipal decision makers in prior seeking their commitment for effective adoption and implementation of EMS and EMIS at a level that may go beyond the minimum requirements posed by the law. As a part of this, the initial activities under component 2 will also consist of: i) compilation of related PR and training materials; ii) establishment of an EMS/EMIS website as the main knowledge management platform for storing and disseminating information on EMS and EMIS and related activities both in Serbia and abroad (including a search for and compilation of the initial set of documents and web-links made available through the website) and, as applicable, iii) establishment of a “hot-line” for the targeted project beneficiaries in the need of direct personal advise.

107. At the end of the first year of project implementation (by taking into account the time needed for effectively starting the project after the prodoc signature), it is expected that at least 30 municipalities have confirmed in writing their interest to benefit from the project support and have committed to: i) start the implementation of a full-fledged high quality EMS and EMIS; ii) to establish a municipal EE office either alone or together with other municipalities (in the case of smaller ones); and iii) to assign the required staff resources for that, including appointment of an energy manager to assume the main responsibility on effective implementation of EMS and EMIS in the municipality(ies) concerned. Further project activities and support will focus only on those municipalities, from which such confirmation in writing has been obtained.

108. In parallel, the project will during the first year of implementation focus on: i) building the capacity and competence of the central Energy Management Support Unit to provide professional advice and other support to municipalities starting the implementation of EMS and EMIS; ii) upgrading the EMIS software to include municipal services such as street lighting, district heating, water supply and public transport to complement the current database structure including public buildings only; iii) further developing the methodologies and procedures for facilitating cost-effective and timely data collection to meet the needs of EMIS, including co-operation with the local electricity and gas distribution companies; and iv) continuing, when possible, the filling of EMIS with data from municipalities that have confirmed their interest to co-operate with the project. Concerning the latter, the project will also support / share the cost of a limited number energy audits and/or the installation of new intelligent metering and software systems to allow for accurate monitoring and reporting of energy consumption in strategic locations selected in co-operation with the co-operating municipalities.

109. More comprehensive training and capacity building of the staff of those municipal EE offices, which have confirmed their interest to co-operate with the UNDP/GEF project is expected to start during the second year of project implementation. To large extent this is expected to consist of “on-the-job” training with the focus on; i) data collection and its quality control to feed the EMIS; ii) analysis of the obtained data and comparing it to the available benchmark values (to be complemented and further developed throughout the project implementation); iii) using the data and available benchmark values for defining realistic targets for municipal EE strategies and action plans; and iv) how to implement and finance them in practice. At least 100 municipal energy managers and other staff of municipal EE offices together with the technical staff of the public utility companies responsible for the operation and maintenance of the public utility services are expected to be fully trained by the end of the project to effectively implement EMS and EMIS. In order to address the potential risk of environmentally not sound management of the waste generated by the investments facilitated by the project e.g. by improper disposal of environmentally hazardous waste and/or inadequate utilisation of recycling opportunities, the training shall cover topics to address also these issues.

110. In co-operation with the SCTM, the project will also explore the opportunities for establishing a network of energy managers, together with the organisation of joint training and networking events.

Outcome 3: At least 10 projects demonstrating the use of EMS and EMIS for identifying, prioritizing and leveraging financing for municipal EE investments and other related EE measures are successfully implemented with reported results for their first year of operation.

111. Component 3 will focus on demonstrating the use of EMS and EMIS for initiating, implementing and leveraging financing for concrete energy efficiency improvement and investment projects. Instead of preselecting four demonstration projects during the project preparatory phase, it was concluded that a more productive approach would be to just define the criteria, under which the projects will be selected during the project implementation. One of those criteria for municipalities to benefit from the available GEF investment grant support would be to have a fully functional EMS and EMIS with established EE offices and appointed energy managers in place. This will present a complementary incentive for the first municipalities to adopt and effectively implement EMS and EMIS. Other draft criteria for the selection of the projects include:

- The GEF grant will cover at maximum 20% of the total investment costs or the total GHG abatement costs for the GEF grant shall not exceed USD 10 per ton of CO₂ reduced, whichever comes first;
- The use of the GEF grant can be combined with other available grant resources such as of those of the national budget funds or the investments grants complementing credit lines of the KfW, EBRD and other international financing entities;
- GEF grant support for one project or municipality cannot exceed USD 50,000; and
- The projects applying for financing shall present an adequate energy saving and GHG emission reduction monitoring and verification plan (MVP), including required hardware incorporated into the project design to facilitate the actual implementation of this MVP plan as well as an adequate waste management plan identifying the potentially hazardous waste and opportunities for recycling of used materials and appliances and presenting a plan for their environmentally acceptable management and disposal.

112. To the extent possible, financing for the demonstration projects are also sought to be leveraged from the specific purpose credit lines such as those established by the EBRD and KfW and/or by demonstrating new contracting and financing modalities such as energy management, supply or service contracts and energy performance guarantees, thereby simultaneously building the local capacity for the replication of such financing modalities.

113. The GEF funding for component 3 will also include support for finalisation of initial energy audits and/or pre-feasibility studies in those 30 municipalities that are targeted to be the first to adopt and take the EMS and EMIS into full use. In this respect, the project also seeks to co-operate with other donors having TA funds allocated for similar purpose.

Outcome 4: Municipal Energy-Efficiency Charter signed by over 80% of all municipalities in Republic of Serbia, enhanced public awareness and improved local capacity to implement and manage investments in energy efficiency

114. Component 4 of the project will focus on expanding the adoption of EMS and EMIS by at least 80% of all Serbian municipalities together with the related capacity building of municipal energy managers and technical experts responsible for maintenance of public buildings and energy consuming public services and strengthening municipal energy efficiency centers and offices to:

- use the EMIS for identifying cost efficient energy saving opportunities;
- develop local energy efficiency action plans;
- develop and implement “green” public procurement schemes;
- develop bankable investment proposals and to structure financing for them;
- in co-operation with the other stakeholders, initiate and organise different promotional activities targeting the general public such as free telephone hotlines for EE advice, EE info centres, EE

corners in shopping centres where EE materials and equipment are on sale etc., from which some experiences were already obtained from the UNDP/GEF funded project in Croatia;

- develop and implement other local actions to improve the energy efficiency of the municipalities concerned; and
- monitor and report on their energy performance in general.

115. As a part of the effort, an Energy-Efficiency Charter will be developed and is encouraged to be signed by all municipalities and cities in Republic of Serbia, defining voluntary targets for energy-efficiency as well as outline specific activities and measures to achieve these targets.

116. The training and other capacity building described above will be complementary to the mandatory training organized by the Ministry of Mining and Energy for meeting the minimum requirements of the staff to become municipal energy managers.

117. In co-operation with the Ministry of Education, the project will also work on ensuring integration of adequate training on state of the art energy efficiency technologies and approaches into the curricula of the vocational and professional schools, the specific content depending on each professional discipline. In many situations, professional workers such as electricians, plumbers and construction workers can play a major role in promoting energy efficiency, because they have a strong influence on the decisions of their customers. Installers, who are trained on new energy efficient technologies are likely to be more motivated to recommend them also to their customers than those, who are not fully familiar with such technologies yet. Another thing is that energy efficient technologies, new materials and construction techniques only fulfil their purpose, if installed correctly.

118. Finally, the activities under component 4 will focus on ensuring that all the municipalities that are using EMIS and have implemented EE projects supported by GEF or other funding have adequate monitoring and reporting arrangements and hardware in place. The project will consolidate information from such municipalities and projects and present as a basis for further replication of similar activities in other municipalities as well as for presenting project's verified direct and indirect GHG reduction impact for GEF project evaluation purposes.

2.2. Project Indicators, Risks and Assumptions

119. In accordance with the Climate Change Objective 2 (CCM-2) of the GEF-5 Focal Area Strategy to "Promote Market Transformation for Energy Efficiency in Industry and the Building Sector", the key success indicators of the project should be:

- Extent to which EE policies and regulations are adopted and enforced;
- Volume of investment mobilized; and
- Tonnes of CO₂ equivalent avoided

120. For further details about the related targets, see the Project's Results Framework (PRF) in Section 3 and Climate Change Mitigation Tracking tool (provided separately).

121. The main identified risks to the successful implementation of the project include:

- Political risk of Republic of Serbia stopping its negotiations to join the European Union and therefore making energy-efficiency less of a priority. Even in the unlikely event that negotiations were stopped or even cancelled, energy-efficiency is likely to remain as a priority for the government, because of its significant cost-savings potential across the economy. Buildings and municipal services with a large share of the overall energy consumption are likely to remain as a priority area.
- Political risk due to the lack of political will to adopt and/or effectively enforce the required policies and strategic goals to promote the adoption and implementation of EMS and EMIS in all Serbian municipalities in a co-ordinated manner and high quality manner. Another significant factor contributing to this are the upcoming municipal elections in 2016, which may influence the project progress in some municipalities both before and after the elections. The legal obligations to establish

an EMS in all municipalities with more 20,000 inhabitants, the expected complementary political commitments from the municipalities wishing to benefit from the UNDP/GEF project support to establish and sustain an adequately staffed energy management office and, eventually most importantly, the demonstrated direct financial and other benefits of EMS and EMIS to the participating municipalities are expected to mitigate this risk and carry on the commitments also to the new administration, in the case some changes are due to the election results.

- Financial risk that the municipalities don't have the financial resources to invest in energy-efficiency i.e. the risk that the project develops a "wish list" of investments with no follow-up. Another risk is that the Government funds currently available to support EE investments are based on annual budget decisions, which can be subject to major changes as a result of budget constraints.

The financial risks as they concern the implementation of the planned demonstration projects only are reduced by the formal co-financing letter obtained from the Government of Republic of Serbia to support the mentioned demonstration projects with at least USD 5.6 million over the duration of the project as well as by the ongoing plans to establish the Energy Efficiency Fund, which at some point during project implementation may still happen. A number of ongoing parallel projects such as those of the KfW and EBRD aiming at overcoming the identified financing barriers and providing technical assistance, establishing specific purpose credit lines and encouraging new financing modalities such as ESCO financing will also mitigate this risk. Based on information received during the project preparatory phase, a number of municipalities have not reached their credit limit yet, meaning that they can still borrow money for investment that make economically and financially sense.

- Economic/financial risk that low prices on electricity, gas and coal are making investments in energy-efficiency less attractive. This risk is considered as low, as the prices are gradually being liberalized, with the electricity market already formally liberalized. One of the requirements of the International Monetary Fund is also to abandon domestic subsidies for oil and gas prices for private households. The IMF currently has over \$1 billion in loans to Republic of Serbia and one of the key provisions of any future assistance is the removal of subsidies.
- Technology risk that due to technical failures of the equipment and/or software used for EMIS and/or for the targeted follow up EE investments, the trust of the key stakeholders and investors on EMIS and on the promoted measures is lost. This risk is considered as low due to the fact that the targeted technologies are based on common and well-proven technologies and the EMIS software and the rest of the system has already been tested and operational over several years in Croatia.
- Environmental/climate change risk that global increase in temperature will reduce demand for energy (especially in winter) and therefore reduce the rationale for increased investments in energy-efficiency. This risk in terms of diminishing the rationality of the project is very low due to the fact that the municipalities do not use energy just for heating. Another thing is that the temperature increases in the near future according to the most recent IPCC estimates even under the business as usual scenario are not expected to be so high that they would completely remove the need for heating of the building stock in Republic of Serbia during the winter time. In fact, the increased variability of temperatures may make the metering and automatic control of heating even more important from both the cost and energy saving point of view. Warmer summer months may also increase the demand for cooling.
- Environmental risk: The energy efficiency investments supported by the project (such as building and lighting retrofits) may generate waste, which, if not properly managed, may be disposed in an environmentally not sound manner. The project will mitigate this risk by having a requirement for all investment proposals seeking for project support to include an adequate waste management plan incorporated into the project design. Environmentally sound waste management, as it relates to the implementation of different energy efficiency retrofit works and disposal of related materials and appliances, will be an issue to be addressed also, when supporting the Serbian municipalities to prepare their municipal energy efficiency action plans.

- Organisational risk of overlapping project activities in respect to other donor funded projects leading to duplication, inefficient use of resources and “donor fatigue” of the targeted beneficiaries. This risk is considered as medium. A considerable effort has been made during the project preparatory phase to fully co-ordinate the design of the UNDP/GEF project with the activities supported by other donors. This effort will be continued by UNDP and the operational project management during project implementation and is expected to be supported also by the Ministry of Mining and Energy as the main entity responsible for co-ordinating energy efficiency policies and projects in Republic of Serbia and related donor funding.
- Organisational risk due to the lack of adequate co-ordination and co-operation on different sectoral policies, strategies and initiatives within and between the central government, local administration and private sector to effectively reach the stated goals. This risk is considered from medium to high due to the institutional challenges elaborated in greater detail in chapter 1.3, but which the project seeks to mitigate by providing a platform for such co-operation through its concrete activities.
- Operational risk concerning inadequate local capacity at the municipal and central government level to effectively implement EMS and EMIS. The strong focus of the project on capacity building and vocational training as well as on establishing EE support units in towns and municipalities in Republic of Serbia is expected to mitigate this risk.
- Operational risk due to the inadequate and/or non-capacitated human resources of the core project team to successfully implement the project and support the mainstreaming of its results. Given the critical role that the project manager and the rest of the project team has in achieving the project results and in the light of the observed difficulties in some other GEF funded projects to recruit such personnel with required qualifications, this risk is considered from medium to high. As such, duly emphasizing and taking into account the required qualifications presented in greater detail in the draft Terms of Reference of these positions and reflected also in paragraph 124 will be of utmost importance for project success.

122. The complementary organisational/institutional risks associated with the adoption and implementation of EMS and EMIS in Republic of Serbia have been discussed in chapter 1.3 (Institutional Framework and Stakeholder Analysis), so a reference for further details is made to there.

123. A typical risk for different training and capacity building activities is that after the completion of training, there will be no real demand for the services of the trained experts. The integrated approach adopted by the project is expected to mitigate this risk by combining the training with concrete possibilities to apply the new skills in practice in the implementation of EMS and EMIS, the planned pilot projects and their envisaged replication.

124. For addressing the operational project management risks, a committed, full-time project manager with adequate adaptive management, outreach and networking skills is absolutely essential for the success of the project. He/she should have an ability: i) to engage the key stakeholders into constructive discussion about the future adoption and implementation of EMS and EMIS in Republic of Serbia; ii) to guide and supervise the studies done and effectively co-operate with the international experts who are engaged to support this work; iii) to present their findings and recommendations in a convincing manner to key policy-makers and opinion leaders by taking into account the main macroeconomic and policy drivers to support the adoption and implementation of EMS and EMIS; iv) to support the participating municipalities to leverage financing for the identified follow-up investments; and v) by ongoing monitoring and evaluation of the project progress against its targets, an ability to adapt the project implementation to the changing circumstances, main support needs and challenges, which may have not been fully reflected or be in place at the original project design. During the project implementation, the project manager also needs to be supported by qualified national and international technical, PR and legal experts.

125. Further details on these risks, with their probability and impact analysis and related mitigation measures, are presented in the “Offline Risk Log” in Annex 8-1.

2.3. Expected Global, National and Local Benefits

126. The calculated global GHG reduction benefits of the project will consist of the combination of:

- Direct GHG emission reduction benefits from the pilot/demonstration projects implemented in the framework of the project and supported by project funding or for which funding has been leveraged by project's TA activities;
- Indirect GHG reduction benefits resulting from broader market transformation arising from project activities during and after the end of the project.

127. No post-project GHG emission reduction benefits arising from ongoing operation of financing mechanisms established or supported by the project have been accounted in this project, as the GEF cash contribution to capital investments represents a one-time capital grant without expected pay-back.

128. The direct GHG reduction benefits of the project have been estimated at 150 kilotons of CO_{2eq}, resulting from the investments supported directly with GEF grant funding or for which financing will be leveraged by project's TA activities during the project implementation period.

129. Additional indirect mitigation benefits can be expected from the adoption of EMIS by new municipalities in Republic of Serbia after successful demonstration of its benefits in the first 30 municipalities and from the related follow-up EE investments and/or operational changes in municipal public buildings and municipal services. These estimated indirect GHG reduction benefits of the project range from 2 up to 3.9 Mtons of CO_{2eq} depending on the calculation methodology used. For further details and related assumptions, a reference is made to Annex 8.5 of the project document

130. The associated national and local benefits include reduced local pollution from the burning of fossil fuels and strengthened national energy security through reduced dependency on imported fuels.

2.4. Project Rationale and GEF Policy Conformity

131. The project was approved into the GEF March 2014 work program under the Climate Change Objective 2 (CCM-2) of the GEF-5 Focal Area Strategy to "Promote Market Transformation for Energy Efficiency in Industry and the Building Sector". According to the strategy; "In the building sector, GEF support will cover residential, commercial, and public buildings, and include both new buildings and retrofitting of existing buildings. It covers the entire spectrum of the building sector, including the building envelope, the energy consuming systems, appliances, and equipment used for heating, cooling, lighting, and building operations. Project activities may incorporate the use of solar energy and thermal capacity of shallow ground for heating and cooling in the building system. Emphasis will be placed on integrated and systemic approaches and high performance buildings, appliances, and equipment."

132. Furthermore it is stated that GEF support under CCM-2 "will involve a synergistic combination of technical assistance on policy, regulation, and institutional capacity building; incentives and financing mechanisms to support the adoption of energy efficiency technologies and measures; piloting innovative technologies, practices, and delivery mechanisms; and support for large-scale dissemination activities." Successful outcomes will include: a) Appropriate policy, legal and regulatory frameworks adopted and enforced; b) Sustainable financing and delivery mechanisms established and operational; and c) GHG emissions avoided.

133. The project objective and outcomes are fully consistent and contribute to the targets set for GEF-5 CCM-2 and its success indicators (as presented in chapter 2.2) and they have also been taken into account in the Project Results Framework.

2.5. Country Ownership: Country Eligibility and Country Drivenness

134. In accordance with the Instrument for the Establishment of the Restructured Global Environment Facility, Republic of Serbia qualifies for GEF financing on the following grounds:

- It has ratified the UN Framework Convention on Climate Change; and
- It receives development assistance from UNDP's core resources.

135. The Serbian Government has ratified both the UNFCCC (2001) and the Kyoto Protocol (2007). Under the Kyoto Protocol, Republic of Serbia is a Non-Annex I Party meaning that it can participate in clean development mechanism (CDM) projects, but not in international emissions trading. Republic of Serbia did not accepted any firm commitments under the Copenhagen Accord, but the letter sent to the UNFCCC Secretariat on January 29th, 2010 indicated a reduction potential from 18% to 29% until 2020 compared to emissions in 1990. This assessment was reviewed during the preparation of the Initial National Communication (INC) of Republic of Serbia to the UNFCCC.

136. The project objective is consistent with the INC, which identifies energy-efficiency in the power generation, industrial, and buildings sectors to have an important role in an effort to reduce GHG emissions in Republic of Serbia. The preparation of the Second National Communication of Republic of Serbia started in November 2014 and is expected to be finalized by August, 2015. A Technology Needs Assessment (TNA) or a National Programming Framework Exercise (NPFE) has not been carried out for Republic of Serbia yet.

137. The project is also consistent with two National Energy Efficiency Action Plans (NEEAP) of 2010-12 and 2013-15 and the National Sustainable Development Strategy (NSDS) of Republic of Serbia, which was prepared in 2008. The NSDS outlines membership of the European Union as a key priority meaning that enhancing energy efficiency measures in line with EU legislation is an important priority for Republic of Serbia. The NEEAP for Republic of Serbia adopted a national indicative target of energy savings of no less than 9% of the final energy consumption by the end of 2018 (an average of 1% improvement in energy-efficiency per year). In addition, the NSDS calls for the development of a competitive market economy and balanced economic growth by safe energy supply with increased energy efficiency.

138. UNDP Serbia currently manages an environment portfolio of over US\$ 34 million¹⁹, including other ongoing GEF projects related to climate change mitigation and biodiversity. The UNDAF 2011-2015 for Republic of Serbia calls for the UN to assist Republic of Serbia with its transition towards a compatible and competitive market economy. UNDAF Outcome 2 calls for Sustainable Development and Social Inclusion Enhanced. In particular, the UNDAF outlines that the UN will help the Government of Republic of Serbia and other relevant institutions in addressing issues related to customs, trans-boundary water, energy and transport resources, risks to the environment, and adaptation to climate change.

139. The project fully complies with the comparative advantages matrix approved by the GEF Council, where UNDP is assigned a leading role for technical assistance and capacity building on climate change. UNDP has a strong comparative advantage in the implementation of projects both in the area of climate change mitigation and urban/local development, including highly relevant recent experience in Croatia from the introduction of EMIS and implementation of energy-efficiency measures at a municipal level through the UNDP GEF energy-efficiency project finished in 2011. Lessons learned by UNDP in other countries on the implementation of energy-efficiency projects are also sought to be reviewed and taken into account throughout the implementation.

140. The GEF Operational Focal Point of Republic of Serbia, Mr. Toni Petrovic, has endorsed the project with a letter signed on 17th May 2013 and with additional clarification provided in the letter signed on 2nd September 2013. The letter was also approved by the GEF Political Focal Point, Minister of Energy, Development and Environmental Protection, Mrs. Zorana Mihajlovic.

¹⁹ Including cofinancing

2.6. Financial Modality and Cost-Effectiveness

141. From the total requested GEF financing (US\$ 2,300,000), US\$ 500,000 has been allocated to be used as complementary grant co-financing for flagship energy efficiency investments in accordance with the draft criteria elaborated in chapter 2 under outcome 3.

142. From the remaining US\$ 1,800,000, US\$ 1,690,500 will be used for technical assistance type of activities in accordance with the Project Results Framework (see Chapter 3 for further details). US\$ 109,500 i.e. 5% of the budget will be used for administrative project management.

143. The estimated combined direct and indirect global benefits of the project range from 2 to 4 million tons of CO_{2eq} depending on the calculation methodology used. With a GEF funding request of US\$2.3 million, this corresponds to the abatement costs of less than US\$ 1.2 per tonne of CO₂ reduced.

144. The estimated project cofinancing will amount USD 19,600,000, of which 17,400,000 in cash in the form of grants or loans and USD 2,200,000 in kind. Further details about the project cofinancing structure, sources and intended use are provided in section 3.

145. The Government in-kind contribution is expected to cover the costs of:

- the cost of the National Project Director and Project Board;
- the cost of the staff of the Ministry of Mining and Energy contributing to the project implementation
- contribution of experts from other public entities to participate in the implementation of the project, as needed;
- provision of office space for the project staff located and working in the premises of the Ministry of Energy and Mining; ;
- provision of information and data to the project staff and consultants as may be required for the implementation of project activities and the realization of project objectives; and
- provision of information gathering services and logistic support to the project staff for the implementation of the project's activities.

2.7. Sustainability (including Financial Sustainability)

146. For the sustainability of the project, it is essential that the measures and activities promoted and supported offer both long and shorter term “win-win-win” opportunities, including:

- environmental benefits by reducing energy consumption and related greenhouse gas emissions;
- municipal budget savings by improved energy efficiency and reduced energy costs; and
- eventually improved quality of the services concerned.

147. A number financing initiatives currently underway in Republic of Serbia (as discussed in further detail in chapter 1.4) also support the idea that by enhancing the capacity of the municipalities to prepare credible EE investment proposals by recognizing their benefits and justifying these initiatives with more accurate data and means for monitoring the results, these opportunities can leverage financing and encourage new financing models (such as Energy Supply and/or Energy Service Contracts) to support the actual investments.

148. To ensure financial sustainability, the GEF cost-sharing for investments is controlled by the criteria discussed in chapter 2 under outcome 3 by taking into account realistic cost-sharing opportunities by the participating municipalities and other investors concerned. The importance of effectively engaging the private sector for activities, into which they can contribute such as energy audits, investment project preparation, training, monitoring and, as applicable, financing is also to be recognized throughout the project implementation.

149. For ensuring project sustainability it is also essential to develop a comprehensive national programme at the municipal level to support energy-efficiency with adequate public sector financial resources, which are not dependent on annual budget decisions only. In practice, this means the establishment of an Energy Efficiency Fund (or something similar) along the lines discussed before.

150. Finally, it is essential that the national and the municipal energy-efficiency support units can continue to operate beyond the lifetime of the project. In this respect, it will be the role of the Government and the participating municipalities to ensure that the units are adequately funded and have other prerequisites in place to continue their operation also after the GEF project.

151. On the other hand and as concluded also by the lessons learnt report of the UNDP/GEF energy efficiency project in Croatia: "Sustainability of results requires building ownership by both local and national authorities". This can be achieved by a combination of measures, as elaborated in further detail in Annex 8.6 and reflected also in the project design. Among these are the continuing need throughout the project implementation to raise the awareness of the key decisions makers and demonstrate the direct financial and other benefits resulting from effective implementation of EMS and EMIS, to build the local capacity to operate and use the EMS and EMIS in a productive way leading to concrete EE improvements, complete and implement public visibility plans and actions to present the achieved results also to the general public, and to focus the initial project efforts to those municipalities only, from which already before starting the technical activities firm political and financial commitments for co-operation can be obtained in accordance with the prerequisites outlined in chapter 2.1 under Outcome 2.

2.8. Replicability

152. The positive experiences from Croatia indicate that once the benefits of EMS and EMIS have been successfully demonstrated, the prospects for its adoption by the majority of municipalities is high. This is further encouraged by the supportive legislation as well as by the knowledge and experience gained by the government and the participating municipalities during the course of this project, which will further enable the transfer of this knowledge and experience to the entire country.

153. Given the foreseen interest of several UNDP-GEF programme countries to similar activities supporting the adoption and effective implementation of municipal EMIS, the materials developed and the results and lessons learned in this project (in addition to those already obtained from Croatia) are expected to be of direct interest also to other countries. Close monitoring and evaluation of project implementation and documenting of the results and lessons learnt will also in this respect be of primary importance.

154. The project seeks to facilitate continuing contacts and co-operation between the different stakeholder groups at the national and international level by organizing seminars, workshops and other public events, thereby bringing project proponents, policy makers and potential investors / other donors together. The co-operation between the different Balkan countries, for instance, from which many have been implementing or are initiating activities of similar kind can be seen mutually beneficial.

3. PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Output as defined in CPAP: Improved energy sector performance through enhanced market mechanisms, renewables and demand-side initiatives

Country Programme Outcome Indicators: Level of Greenhouse Gas Emissions

Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):

1. Mainstreaming environment and energy OR
2. Catalyzing environmental finance OR
3. Promote climate change adaptation OR
4. Expanding access to environmental and energy services for the poor.

Applicable GEF Focal Area Objective: CCM-2: Promote Market Transformation for Energy-Efficiency in Industry and the Building Sector

	Indicator	Baseline	Targets - End of Project	Source of verification	Risks and Assumptions
Project Objective²⁰: Promote greater investment in energy-efficiency in public buildings and services in the municipal sector in Republic of Serbia	Tonnes of incremental CO ₂ equivalent avoided as a direct result of project activities	0	Direct GHG emission reduction: 150 ktons of CO _{2eq} calculated over the default lifetime of 15 years of the investments or other EE measures implemented	Project's verified energy saving and GHG monitoring reports	The necessary legal, regulatory, institutional and financial prerequisites to proceed with the planned investments and other EE (operational) improvements exist
	Incremental energy savings as a direct result of project activities	0	Energy savings of at least 94 TJ per year or 1,400 TJ over the default lifetime of 15 years from the investments and other measures facilitated by the project.	See above	See above
	Amount of investment in energy-efficiency in public buildings and services in the municipal sector directly facilitated by the project	0	15 mln US\$ by the end of the project	Final evaluation	Partners maintain their financial commitments

²⁰Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR

	Number of new development partnerships with funding for improved energy efficiency (IRRF Indicator 1.5.1.A)	0	30 new partnerships (i.e. 30 municipalities have formally adopted and started the implementation of EMS and EMIS)	Final evaluation	Political will and commitment at municipal level exist
	Number of people benefitting from improved public services	0	To be specified at the inception phase	Final evaluation	See above
Outcome 1²¹: An enabling legal and regulatory framework to support adoption and effective implementation of municipal energy management systems and related energy efficiency measures.	Extent to which the required new EE policies and regulations (or those be updated) are adopted.	0	Formal adoption of at least 5 new/updated Government regulations, rulebooks and/or municipal ordinances directly supported by the project to enable effective implementation of municipal energy management and energy management information systems	Official Gazette of Serbia	Continuing political support to the suggested legal and regulatory changes
Outcome 2: Central and municipal energy efficiency support units are established and operational and their capacity is built to establish energy management and information systems (EMIS) at the municipal level	Status of the central EE Support Unit and the number of new, adequately staffed and capacitated municipal EE support units established	0	The central EE support unit either within the Ministry responsible for energy or as an independent entity established, adequately staffed and capacitated and with adequate financial allocations by the Government budget to continue its operation also after the end of the project. At least 30 municipalities have formally adopted and started the implementation of EMS and EMIS with: 1) appointed energy managers and EE support units established; 2) EMIS data coverage of at least 80% of the energy consumption and other agreed information from the targeted municipal subsectors; 3) completed EE strategies and action plans	Project monitoring and evaluation reports Project monitoring and evaluation reports	Continuing political support both at the central government and municipal level, allocations of adequate budget and/or other financial resources to support continuing operation of the centers and success in overcoming the identified institutional barriers.

²¹All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.

			with concrete time-bound EE targets; and 4) monthly/annual energy monitoring reports published using data from EMIS		
Outcome 3: At least 10 “best practice” demonstration projects demonstrating the use of EMS and EMIS for identifying, prioritizing and leveraging financing for municipal EE investments and other related EE measures are successfully implemented with reported results for their first year of operation.	Number of successfully completed demonstration project and volume of investment leveraged by the project	0	At least 10 demonstration projects completed with at least one year verifiable monitoring data on the saved energy and GHG emissions reduced. At least USD 15 million leveraged for new EE investments facilitated by the project.	Project monitoring and evaluation reports	Continuing political support both at the central government and municipal level and availability of adequate co-financing to proceed with the suggested investments.
Outcome 4: Municipal Energy-Efficiency Charter signed by over 80% of all municipalities in Republic of Serbia, enhanced public awareness and improved local capacity to implement and manage investments in energy efficiency.	Number of municipalities signing the Energy Efficiency Charter Number of trained energy managers Number of professional/ vocational schools having adopted curricula with greater emphasis on state of the art energy efficient technologies and approaches.	0 0 No curricula with adequate emphasis on EE	At least 80% of all Serbian municipalities have signed the Energy Charter with a stated intention to adopt the EMIS. Training of at least 100 municipal energy managers. The curricula of all professional and vocational schools dealing with energy efficiency related professional disciplines (electricians, plumbers, construction workers etc.) and located in the municipalities that have adopted EMIS have been strengthened with state of the art energy efficient technologies and approaches.	Project monitoring and evaluation reports	Continuing political support both at the central government and municipal level for the adoption of EMIS and required financial support to facilitate the required investments (e.g. on remote controlled metering)

PROJECT OUTPUTS AND RELATED TARGET(S)/SUB-TARGET(S), AS APPLICABLE

Outcome 1:	Outcome 2:	Outcome 3:	Outcome 4 :
Output 1.1: Review of the remaining legal and regulatory barriers to effectively promote energy efficiency in Serbian municipalities addressing areas such as minimum energy performance standards, tariff setting for public utility services, laws and regulations guiding public procurement, allocation of eventual financial savings from EE measures implemented in public entities etc.	Output 2.1: Central Energy Management Support Unit (+ a hotline, as applicable) established within the Ministry of Mining and Energy and its capacity and competence built.	Output 3.1: At least 10 demonstration projects from different municipalities, selected based on a public call for proposals.	Output 4.1: By building on results, experiences and lessons learnt from introducing EMIS in the first 30 municipalities in Republic of Serbia as well as in other countries, preparing and delivering a “road show” for presenting to and expanding the adoption of EMS and EMIS at a coherent, high quality level also in other Serbian municipalities
Output 1.2: By building on the conclusions of output 1.1, draft recommendations for the required legal and regulatory changes to better promote energy efficiency in Serbian municipalities.	Output 2.2 A municipal EE/EMS website hosted by MoME or another entity such as SCTM with compiled, consolidated and regularly updated information, experiences, available training materials and lessons learnt from implementing municipal EMS and EMIS both in Republic of Serbia and abroad.	Output 3.2: Technical assistance for completing the design, financial structuring and implementation of the demonstration projects	Output 4.2: Municipal Energy Efficiency Charter developed and signed by at least 80% of all Serbian municipalities by building on the Croatian model
Output 1.3: An updated assessment of the level of enforcement of the adopted laws and regulations, identified barriers and recommendations to remove those barriers	Output 2.3: Upgraded EMIS software to include also public utility services (street lighting, district heating, sanitary water supply and public transport) in addition to public buildings and to facilitate interchange of data with other databases.	Output 3.3: Documenting and publishing of the demonstration project results and lessons learnt, including their monitored and verified energy savings and GHG emission reduction impact	Output 4.3: Updated curricula with related training materials on the state of the art EE technologies and approaches developed for at least 3 different professional fields (electricians, plumbers, construction workers) and taken into use in at least 10 different professional/ vocational schools
Output 1.4 Developing and facilitating the adoption of voluntary norms and minimum energy performance and environment standards for public administration and services with links to “green public procurement”, “green office” and “smart city” initiatives exceeding the minimum legal and regulatory requirements.	Output 2.4 Awareness raising, public outreach and direct consultations with municipal decision makers to present EMS and EMIS and their benefits to municipalities + awareness raising of the general public on EE by building on the existing materials and co-operation with other ongoing EE related initiatives in Republic of Serbia.	Output 3.4: Supporting the cost-benefit analysis, preparation of initial investment proposals and structuring financing for EE and RE projects in other municipalities	Output 4.4 Regularly updated web-based energy managers’ “handbook” providing guidance on implementing EMS and EMIS typical no or low cost EE improvements of public buildings and services, project financing, design and implementation of public awareness raising campaigns, green public procurement and criteria for assessing the quality of the services received, such as energy audits.

	Output 2.5 Concluded co-operation agreements with at least 30 municipalities to adopt EMS and EMIS and to establish municipal energy management offices/ support units.		Output 4.5 Public outreach campaigns, events and facilities (such as EE info offices and stands), including possibilities for the potential clients (including both private and public sector) and suppliers of EE equipment and services to meet.
	Output 2.6: EMS and EMIS formally taken into use with appointed energy managers and energy management offices / support units established in at least 30 municipalities, followed up by related on-the-job training and capacity building.		Output 4.6 Updated project exit strategy
	Output 2.7 In co-operation with the SCTM, establish a network of energy managers, together with the organisation of related joint training and networking events		Output 4.7 End-of-the project workshop
	Output 2.8 Completion and filling of the EMIS database with the agreed data from all the co-operating municipalities, including installation of new meters and conducting energy audits, when necessary.		
	Output 2.9 Analysis of the data obtained and defining the indicators and benchmark values to be included into EMIS, on the basis of which the municipalities can assess their energy performance		
	Output 2.10 Completed municipal EE strategies and action plans published by at least 30 municipalities with clearly defined EE targets		
	Output 2.11 Completed and implemented public visibility plan and actions to present the EE strategies and action plans and the results achieved to the general public		
	Output 2.12 Monthly/annual energy monitoring reports published by at least 30 municipalities		

Draft Project Implementation Plan

Project component	2015		2016				2017				2018				2019				2020	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Outcome 1																				
Output 1.1																				
Output 1.2																				
Output 1.3																				
Output 1.4																				
Outcome 2																				
Output 2.1:																				
Output 2.2																				
Output 2.3																				
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Output 2.7																				
Output 2.8																				
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Output 2.11																				
Output 2.12																				
Outcome 3																				
Output 3.1:																				
Output 3.2																				
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Output 3.4																				
Outcome 4																				
Output 4.1																				
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Output 4.3																				
Output 4.4																				
Output 4.5																				
Output 4.6																				
Output 4.7																				

4. TOTAL BUDGET AND WORKPLAN

Award ID:	00087720				Project ID(s):	00094643						
Award Title:	Serbia - Removing Barriers to Promote and Support Energy Management Systems in Municipalities (EMIS) throughout Serbia											
Business Unit:	UNDP Serbia											
Project Title:	Serbia - Removing Barriers to Promote and Support Energy Management Systems in Municipalities (EMIS) throughout Serbia											
PIMS no.	4588											
Implementing Partner (Executing Agency)	Ministry of Mining and Energy or its successor responsible on energy issues											
GEF Outcome/ Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budget. Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
OUTCOME 1	MoME/UNDP	62000	GEF	71200	International Consultants	0	7 500	0	0	0	7 500	1
				71300	Local Consultants	10 000	10 000	10 000	10 000	0	40 000	2
				71400	Contractual services – indiv.	14 000	14 000	14 000	14 000	14 000	70 000	3
				71600	Travel	500	2 000	500	500	500	4 000	4
				72100	Contractual services – comp.	5 000	5 000	5 000	5 000	0	20 000	2
				72200	Equipment	0	0	0	0	0	0	
				74500	Miscellaneous	700	700	700	700	700	3 500	
				75700	Workshops and meetings	1 000	1 500	1 500	1 000	0	5 000	
	Sub-total GEF					31 200	40 700	31 700	31 200	15 200	150 000	
Total Outcome 1					31 200	40 700	31 700	31 200	15 200	150 000		
OUTCOME 2	MoME/UNDP	62000	GEF	71200	International Consultants	12 500	0	10 000	0	0	22 500	1
				71300	Local Consultants	45 000	45 000	50 000	50 000	0	190 000	5
				71400	Contractual services – indiv.	63 600	43 600	43 600	43 600	43 600	238 000	3
				71600	Travel	12 000	10 000	12 000	10 000	6 000	50 000	4
				72100	Contractual services – comp.	45 000	45 000	45 000	45 000	0	180 000	6
				72200	Equipment	80 000	100 000	80 000	80 000	0	340 000	7
				74500	Miscellaneous	1400	900	900	900	400	4 500	
				75700	Workshops and meetings	1 000	1 500	1 500	1 000	0	5 000	
	Sub-total GEF					260 500	246 000	243 000	230 500	50 000	1 030 000	
	MoME/UNDP	4000	UNDP	71400	Contractual services – indiv.	0	20 000	20 000	20 000	20 000	80 000	3
Subtotal UNDP					0	20 000	20 000	20 000	80 000			
Total Outcome 2						260 500	266 000	263 000	250 500	70 000	1 110 000	
OUTCOME 3	MoME/UNDP	62000	GEF	71200	International Consultants	0	5 000	0	10 000	0	15 000	1

				71300	Local Consultants – short term	2 000	5 000	6 000	6 000	5 000	24 000	8
				71400	Contractual services – indiv.	18 800	18 800	18 800	18 800	18 800	94 000	3
				71600	Travel	1 000	3 000	1 000	3 000	1 000	9 000	4
				72100	Contractual services – comp.	3 000	7 000	7 000	7 000	0	24 000	8
				72600	Grants	0	50 000	200 000	250 000	0	500 000	9
				74500	Miscellaneous	1 000	1 000	1 000	1 000	1 000	5 000	
				75700	Workshops and meetings	1 000	1 000	1 000	1 000	0	4 000	
				Sub-total GEF		26 800	90 800	234 800	296 800	25 800	675 000	
				Total Outcome 3		26 800	90 800	234 800	296 800	25 800	675 000	
OUTCOME 4	MoME/UNDP	62000	GEF	71200	International Consultants	0	0		7 500		7 500	1
				71300	Local Consultants	10 000	10 000	10 000	10 000	0	40 000	11
				71400	Contractual services – indiv.	18 450	18 450	18 450	18 450	18 450	92 250	3
				71600	Travel	1 250	1 250	1 250	1 500	750	6 000	4
				72100	Contractual services – comp.	10 000	10 000	10 000	10 000	0	40 000	11
				72200	Equipment	15 000	15 000	15 000	15 000	0	60 000	12
				74200	Printing and publication costs	0	5 000	10 000	5 000	0	20 000	13
				74500	Miscellaneous	550	300	300	300	300	1 750	
				75700	Workshops and meetings	1 000	2 000	2 000	2 000	1 000	8 000	
Sub-total GEF		56 250	62 000	67 000	69 750	20 500	275 500					
Total Outcome 4		56 250	62 000	67 000	69 750	20 500	275 500					
MONITORING AND EVALUATION	MoME/UNDP	62000	GEF	71200	International Consultants			15 000		18 750	33 750	10
				71400	Contractual services – indiv.	3000					3 000	3
				71600	Travel	400	400	2 000	1 400	2 300	6 500	4
				74100	Professional services		3 750	3 750	3 750	3 750	15 000	14
				74500	Miscellaneous	400	300	200	550	300	1 750	
				Sub-total GEF		3 800	4 450	20 950	5 700	25 100	60 000	
	MoME/UNDP	4000	UNDP	71400	Contractual services – indiv.		5 000	5 000	5 000	5 000	20 000	3
				Sub-total UNDP			5 000	5 000	5 000	5 000	20 000	
	Total Monitoring and Evaluation		3 800	9 450	25 950	10 700	30 100	80 000				
PROJECT MANAGEMENT	MoME/UNDP	62000	GEF	71400	Contractual services – indiv.	38 550	13 550	13 550	13 550	13 550	92 750	3
				74500	Miscellaneous	900	250	250	250	100	1 750	
				74598	Direct project costs	3 000	3 000	3 000	3 000	3 000	15 000	
				Sub-total GEF		42 450	16 800	16 800	16 800	16 650	109 500	
		4000	UNDP	71400	Contractual services – indiv.	0	25 000	25 000	25 000	25 000	100 000	3
	Sub-total UNDP			0	25 000	25 000	25 000	25 000	100 000			
Total Project Management		42 450	41 800	41 800	41 800	41 650	209 500					
TOTAL GEF	MoME/UNDP	62000	GEF			421 000	460 750	614 250	650 750	153 250	2 300 000	
TOTAL UNDP	MoME/UNDP	4000	UNDP			0	50 000	50 000	50 000	50 000	200 000	

GRAND TOTAL	421 000	510 750	664 250	700 750	203 250	2 500 000	
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Budget Notes

Number	Note
1	International project adviser supporting the annual planning and adaptive management of the project
2	Legal and other local expert support for Outputs 1.1 - 1.4 (shared between budget lines 71300 and 72100)
3	Salaries of the core project team
4	International and local expert travel
5	Initial data compilation for the EMIS database; Supervision of the meter installations; Support for preparation of municipal strategies and action plans
6	Energy audits and design of monitoring system to feed EMIS; upgrade and annual maintenance of the EMIS software; training and capacity buildings
7	Servers to host EMIS; Metering and other related monitoring and IT equipment for participating municipalities
8	Technical support for finalized design of the investment projects; GHG monitoring and impact analysis of the selected projects (shared between budget lines 71300 and 72100)
9	Cost sharing of selected demo projects
10	International experts for mid-term and final evaluations
11	Preparation of updated curricula and training materials for professional schools, manual for municipal energy managers and other related educational materials (shared between budget lines 71300 and 72100)
12	Training equipment for professional schools
13	Publishing costs of the training and other educational materials developed
14	Financial audit costs

Summary of Funds²²

Source of Funding	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
GEF	421,000	460,750	614,250	650,750	153,250	2,300,000
UNDP	60,000	110,000	110,000	110,000	110,000	500,000
Other co-financing cash	2,825,000	2,937,500	5,437,500	3,000,000	3,000,000	17,200,000
Other co-financing in-kind	580,000	580,000	580,000	80,000	80,000	1,900,000
TOTAL	3,886,000	4,088,250	6,741,750	3,840,750	3,343,250	21,900,000

²² Summary table should include all financing of all kinds: GEF financing, co-financing, cash, in-kind, etc.

SUMMARY OF PROJECT CO-FINANCING (IN USD)

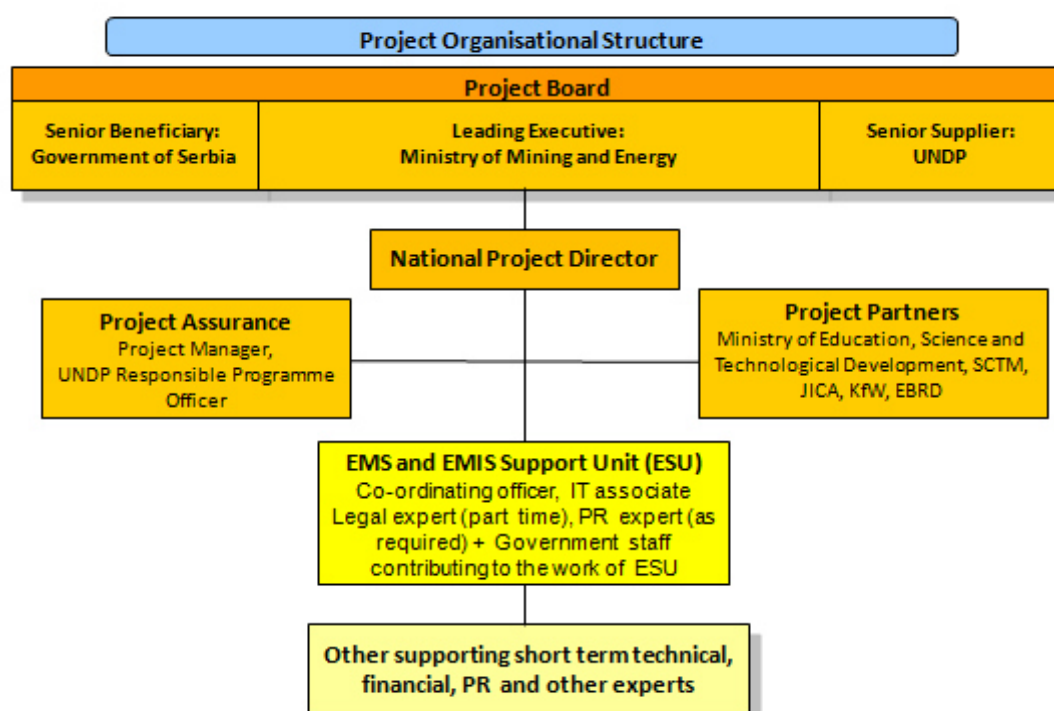
		Ministry of Mining and Energy ²³	Local municipalities	Standing Conference of Towns and Municipalities	JICA	KfW ²⁴	UNDP	TOTAL	TOTAL ALL
Outcome 1	Cash				200,000			200,000	850,000
	In-kind	600,000		50,000				650,000	
Outcome 2	Cash				400,000		80,000	480,000	1,160,000
	In-kind	400,000		200,000			80,000	680,000	
Outcome 3 TA	Cash					700,000		700,000	800,000
	In-kind	100,000						100,000	
Outcome 3 Inv.	Cash	5,600,000	1,600,000			8,000,000		15,200,000	15,200,000
	In-kind							0	
Outcome 4	Cash				400,000			400,000	900,000
	In-kind	300,000		100,000			100,000	500,000	
Monitoring & Evaluation	Cash						20,000	20,000	90,000
	In-kind	50,000					20,000	70,000	
Project management	Cash					300,000	100,000	400,000	600,000
	In-kind	50,000		50,000			100,000	200,000	
TOTAL	Cash	5,600,000	1,600,000	0	1,000,000	9,000,000	200,000	17,400,000	19,600,000
	In-kind	1,500,000		400,000	0	0	300,000	2,200,000	
Description		Outcome 1: Analysing and drafting the supporting legal and regulatory framework		Outcome 1: Contributing to the development of the legal and regulatory	Outcome 1: Support of scheme design for the secondary legislation of EMS	Outcome 3: Support for EE and RE investments	Outcome 2: Support for establishment of EMIS and capacity building of local EMIS support units		

²³ The co-financing amounts of the Ministry of Mining and Energy (MoME) and the KfW shown in the table (and influencing also the total project co-financing) slightly differ from the figures shown in the related co-financing letters. For the MoME, this is due to the fact that the original commitments in the co-financing letter were made in Serbia Dinars (RSD), after which they were transformed to US\$ by using an exchange rate of 1 US\$ = 96 RSD at the time of writing the letter. Since then the exchange rate has already changed to 1 US\$ = 108 RSD (as of June 03, 2015) and this fluctuation is likely to continue also in the future. As such, it was not considered as rational to include the converted US\$ amounts of the MoME letter into the project co-financing calculations at the same level of accuracy as in the letter, but all of them were rounded downwards. This is expected to be acceptable also to the GEF as long as the co-financing amounts shown in table C do not exceed the amounts stated in the letters. For the Ministry's in-kind contribution, the letter stated that over USD 6 million in total over 4 years have been planned for the field of energy efficiency, on which UNDP estimated that around USD 1,5 million could realistically be seen directly contributing towards reaching the project objective. Thus the reduced amount stated in the project co-financing table.

²⁴ An assessment similar to the Ministry of Mining and Energy (MoME) cofinancing contribution was applied for the amount stated in the KfW letter, for which it was estimated that out of the total of 26 million Euros expected to be invested in municipal RE and EE investments (40% out of 65 million Euros) through the MEGLIP programme, USD 9 million will be set as a target to be directly leveraged and influenced by the UNDP/GEF project.

			framework through its working committees				
	<u>Outcome 2:</u> Establishment of energy management support unit	<u>Outcome 3:</u> Expected cost-sharing of municipalities	<u>Outcome 2:</u> Supporting the introduction and adoption of EMIS by local municipalities	<u>Outcome 2:</u> Assisting the implementation of EMS and review of first year activities		<u>Outcome 4:</u> Support for public outreach	
	<u>Outcome 3:</u> Co-financing EE and RE investment through National EE Budget Fund		<u>Outcome 4:</u> Support for training and public outreach	<u>Outcome 4:</u> Support for preparation of training programs and establishment of training facilities		<u>Project management:</u> Logistic support and sharing the core project team costs	

5. MANAGEMENT ARRANGEMENTS



155. The project will be implemented by the Ministry of Mining and Energy (MoME) under the National Implementing Modality following the UNDP guidelines for nationally implemented projects. The Ministry will sign a Letter of Agreement with UNDP and will be accountable to UNDP for the disbursement of funds and the achievement of the project goals, according to the approved work plan. The MoME will assign a senior officer as the National Project Director to: (i) coordinate the project activities with activities of other Government entities; (ii) certify the expenditures in line with approved budgets and work-plans; (iii) facilitate, monitor and report on the procurement of inputs and delivery of outputs; (iv) approve the Terms of Reference for consultants and tender documents for sub-contracted inputs; and (v) report to UNDP on project delivery and impact.

156. A Project Board chaired by the National Project Director will be established at the inception of the project to monitor project progress, to guide project implementation and to support the project in achieving its listed outputs and outcomes. It will also play an important role in further resource mobilization. Beside the Ministry of Mining and Energy represented by the National Project Director, the Board is expected to include representatives from the Standing Conference of Towns and Municipalities of Serbia (SCTM), Ministry of Education (MoE) and UNDP. The final list of the Project Board members will be completed at the outset of project operations and presented in the Inception Report. New members into the Board or participants into the Board meetings during the project implementation can be invited at the decision of the Board, by ensuring, however, that the Board will remain sufficiently lean to facilitate its effective operation.

157. The Project Board will meet regularly (at least twice a year) to review project progress, discuss and agree on project work plans. One of the key tasks of the Board will be to ensure coordination and synchronization of central and local-level activities supported by the project. In this respect, the Board will serve as a platform for key project stakeholders to regularly get together and design on a joint strategy of work to reach the envisaged project results. Based on the decision of the Project Board, smaller working groups can also be established to implement or to oversee specific project activities.

158. By taking into account all of the above, the Project Board will contain three distinct roles:

- Executive Role: It will represent the project “owners” and will chair the group. It is expected that the Ministry of Mining and Energy will appoint a senior official - National Project Director to this role, who will ensure full government support to the project.
- Senior Supplier Role: This role requires the representation of the interests of the parties concerned, which provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier’s primary function within the Board will be to provide guidance regarding the technical feasibility of the project. This role will rest with UNDP-Serbia represented by the Resident Representative.
- Senior Beneficiary Role: This role requires representing the interests of those, who will ultimately benefit from the project. The Senior Beneficiary’s primary function within the Board will be to ensure the realization of project results from the perspective of project beneficiaries. This role will rest jointly with MoME, SCTM and MoE.

159. Project Assurance: The Project Assurance role supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions. The Project Assurance role will rest with the UNDP Serbia Environment Focal Point.

160. A full time Project Manager will be recruited by UNDP, who will be delegated the authority for the day to day implementation of the project, including supervision, management and co-ordination of all project activities and financial matters, and to provide advice on the technical, legal and financial aspects of the project. The Project Manager’s prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. For successfully doing this, public outreach, establishment of the contacts and co-operation with the key local and international stakeholders and expert institutions as well as ability for adaptive management and new innovative approaches will be of utmost importance and will be emphasized in the recruitment. In addition to the Project Manager, the Core Project Team will include a Coordinating Officer, Project Assistant and IT Associate, all to be recruited by UNDP. Furthermore, the project will contract an experienced international project adviser (part time) to support the project inception phase and project’s annual planning and adaptive management throughout the project implementation. The need for complementary international expertise will be determined on a case by case basis during the project implementation. When working with international experts, particular emphasis is to be put on building in parallel the capacity of the local experts through on-the-job training and otherwise. The Terms of Reference of the key project personnel are presented in Section IV, Part IV of this Project Document.

161. The decision making discretion of the Project Manager, without a Project Board decision, is limited to 10% deviation in funds from the agreed upon Annual Work Plan and 1 month deviation in terms of the deadlines set for implementation by the Annual Work Plan. The project manager will participate as a non-voting member in the Board meetings and will also be responsible for compiling a summary report of the discussions and conclusions of each meeting. He/she will report quarterly to the Project Board and to UNDP Serbia on the status of the project including, as necessary, independently audited financial statements.

162. A central Energy Management Support Unit will be established within MoME to manage the grant component of the project and to support the municipalities (and municipal energy management/support units) to adopt, develop and implement EMS and EMIS by taking stock of results from relevant prior or ongoing national and international activities and by facilitating information exchange between the national and relevant regional and international expert institutions. While the Ministry is currently not allowed to recruit any new full time staff to operate the Energy Management Support Unit, the Ministry will appoint staff from its Energy Efficiency and Strategic Planning Departments to contribute (part time)

to the work of the Energy Management Support Unit as a part of its in-kind contribution. These regular staff resources of the Ministry are complemented by the project Co-ordinating Officer and IT associate working full time for the project in the premises of the Ministry to support the initial establishment of EMS and EMIS. After done, the Ministry and the Serbian municipalities are expected to be able to carry on with the EMS and EMIS on their own. This will be assessed and addressed in greater detail in the project exit strategy (Output 4.6)

163. At the outset of project operations, a project inception report will be prepared in co-operation with the key stakeholders, local and international expert(s) engaged in leading or supporting the implementation of the project. The inception report will include detailed work plans for each subcomponent (output) of the project at the specific activity level and elaboration of the required resources and stakeholders to be involved for reaching the stated targets. These output specific work plans will provide the main basis for day-to-day management, implementation and monitoring of the progress of the project, complemented by the annual monitoring to be done at the Outcome level by the PIRs. Prior to starting the actual implementation of the work plan, the work plan will be reviewed and must be approved, together with the associated revised budget, by the Ministry of Mining and Energy and UNDP Serbia. For further details about the project's overall monitoring and evaluation framework, see chapter 6.

164. For successfully reaching the objective and outcomes of the project, it is essential that the progress of different project components will be closely monitored both by the key local stakeholders and authorities as well as by project's international technical adviser (as applicable), starting with the finalization of detailed, component-specific work plans and implementation arrangements and continuing through the project's implementation phase. The purpose of this is to facilitate early identification of possible risks to successful completion of the project together with adaptive management and early corrective action, when needed.

165. The activities of other donors and the foreseen synergies and opportunities for co-operation have been discussed in further detail in chapter 1.4. During project implementation, proper care is to be taken to have adequate communication and co-ordination mechanisms in place to ensure that areas of common interest can be addressed in a most cost-efficient way. By promoting information exchange between the participating institutions both through the Project Board and otherwise, the project seeks to identify, to create links to, and to use the results of all the other prior or ongoing activities relevant to the project. From the financial point of view, the project activities will be co-ordinated closely with the activities supported by other sources of financing such as the EU/IPA and the different bilateral organizations (KfW, GiZ, JICA etc) as well as multilateral International Financing Institutions (IFIs) active in Serbia such as EBRD and World Bank.

166. In all its PR and outreach activities, the project will adhere strictly to the GEF Communication and Visibility Policy. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all materials, publications, websites, display panels, promotional items, photographs, audiovisual productions, public events and visits and information campaigns targeting tourists and other stakeholders as well as on hardware supported by GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgement to GEF in accordance with the respective GEF guidelines.

Prerequisites for implementation

167. The Government of Republic of Serbia will allocate the necessary funds to support the project. In addition, it will ensure that the project execution and implementation arrangements will be in place at the outset of project operations, including the establishment of the Project Board to oversee the overall implementation of the project.

168. Should the national experts that will be hired by the project currently work under direct employment of the Government of Republic of Serbia, they will have to obtain a leave of absence without payment for the duration of their work for the project. A document to this effect, signed by an authorised person, has to be attached to the request for payment.

169. The Project Document will be signed by the Government of Republic of Serbia and UNDP. Assistance for the project will be provided only if the prerequisites stipulated above have been fulfilled or are likely to be fulfilled. When anticipated fulfilment of one or more prerequisites fails to materialise, UNDP may, at its discretion, either suspend or terminate its assistance.

6. MONITORING FRAMEWORK AND EVALUATION

170. The project will be monitored through the following M&E activities. The M&E budget is presented at the end of this chapter.

Project Start

171. A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, the UNDP Country Office and – where appropriate/feasible – regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

172. The Inception Workshop should address a number of key issues including:

173. Assist all partners to fully understand and take issues ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.

174. Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, including adding of and agreement on the mid-term targets of each outcome in the project's M&E plan and re-check assumptions and risks.

175. Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.

176. Discuss financial reporting procedures and obligations, and arrangements for annual audit.

177. Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

178. An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly

179. Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.

180. Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

181. Based on the information recorded in Atlas, Project Progress Reports (PPRs) can be generated in the Executive Snapshot.

182. Other ATLAS logs can be used to monitor issues, lessons learned, etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually

183. Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and, in particular, for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

184. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes – each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual)
- Lesson learned/good practice
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR

185. Portfolio-level indicators (e.g. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

Periodic Monitoring Through Site Visits

186. The UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first-hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of Project Cycle

187. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made towards the achievement of outcomes and will identify course corrections if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

188. The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project

189. An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals.

The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

190. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

191. The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

192. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and Knowledge Sharing

193. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

194. The project will identify and participate in, as relevant and appropriate, scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

195. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Communications and Visibility Requirements

196. Full compliance is required with UNDP's Branding Guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>, and specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects need to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at <http://intra.undp.org/coa/branding.shtml>.

197. Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: [http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding the GEF%20final 0.pdf](http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf).

198. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

199. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

M & E WORKPLAN AND BUDGET

Type of M&E activity	Responsible Parties	Budget US\$	Time frame
Inception Workshop and Report	Project Manager supported by an International Expert UNDP CO, UNDP GEF	US\$10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	tbd (included in the outcome budgets)	Start, mid- and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	Oversight by Project Manager Project team	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	Project manager and team UNDP CO, UNDP RTA, UNDP EEG	US\$5,000	Annually
Periodic status/ progress reports	Project manager and team	US\$5,000	Quarterly
Mid-term Evaluation	Project manager and team UNDP CO, UNDP RCU External Consultants (i.e. evaluation team)	US\$20,000	At the mid-point of project implementation.
Final Evaluation	Project manager and team, UNDP CO UNDP RCU External Consultants (i.e. evaluation team)	US\$20,000	At least three months before the end of project implementation
Project Terminal Report	Project manager and team UNDP CO local consultant	US\$5,000	At least three months before the end of the project
Audit	UNDP CO Project manager and team	US\$15,000 (US\$ 3,750 over 4 years)	Yearly
Visits to field sites	UNDP CO UNDP RCU (as appropriate) Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly

Type of M&E activity	Responsible Parties	Budget US\$	Time frame
TOTAL INDICATIVE COST (excluding UNDP staff and travel expenses as well as the in-kind contributions of the other project implementing and co-financing partners)		US\$80,000 (+/- 5% of total budget)	

7. LEGAL CONTEXT

200. This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA and all CPAP provisions apply to this document.

201. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

202. The implementing partner shall:

- put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

203. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

204. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

205. Audit Clause: The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects.

8. ANNEXES

Annex 8.1. Offline Risk Log

#	Description	Date identified	Type	Probability & Impact	Countermeasures / Mgt response	Owner	Submitted, updated by	Last Update	Status
1,	Risk of Republic of Serbia stopping its negotiations to join the European Union and therefore making energy-efficiency less of a priority.		Political	P ²⁵ = 2 I ²⁶ = 4	Even in the unlikely event that negotiations were stopped or even cancelled, energy-efficiency is likely to remain as a priority for the government, because of its significant cost-savings potential across the economy. Buildings and municipal services with a large share of the overall energy consumption are likely to remain as a priority area.	Project Board			
2.	Lack of political will to effectively enforce and support the implementation of EMS and EMIS in all Serbian municipalities in a co-ordinated, high quality manner.		Political	P = 3 I = 4	This risk is sought to be mitigated by extensive awareness raising activities of the project to highlight the direct cost of benefits of EMS and EMIS as well by selected demonstration projects to illustrate these benefits in practice.	Project Board			
3.	Municipalities don't have the financial resources to invest in energy-efficiency i.e. the risk that the project develops a wish list of investments with no follow-up in terms of the actual investments.		Financial	P = 3 I = 4	This risk is mitigated by a number financing schemes currently available in Republic of Serbia with reasonable terms to finance EE investments also in the municipal sector. Based on consultations during the project preparatory phase, still a number of municipalities have not reached their credit limit yet, meaning that they can still borrow money for investment that make economically and financially sense.	Project Board			
4.	Technical failures of the promoted technologies and building practices leading to		Technology	P = 2 I = 4	The promoted technologies can already considered to be technically mature technologies, so the risk of their technical failure due to the early stage of their technical	Project team			

²⁵Probability from 1 (low) to 5(high)

²⁶Impact from 1 (low) to 5 (high)

#	Description	Date identified	Type	Probability & Impact	Countermeasures / Mgt response	Owner	Submitted, updated by	Last Update	Status
	the loss of trust by targeted customers on the proposed measures.				development is considered as low. This does not detract, however, from the importance of adequate quality control of both products and installations at all stages of implementation.				
5.	The global increase in temperature will reduce demand for energy (especially in winter) and therefore reduce the rationale for increased investments in energy-efficiency.		Environmental	P = 2 I = 1	This risk in terms of diminishing the rationality of the project is very low due to the fact that the municipalities do not use energy just for heating and in any case the temperature increases in the near future according to the most recent IPCC estimates even under the business as usual scenario are not expected to be so high that they would completely remove the need for heating of the building stock in Republic of Serbia during the winter time. In fact, the increased variability of temperatures may make the metering and automatic control of heating even more important from both the cost and energy saving point of view.	N/A			
6.	The energy efficiency investments supported by the project (such as building and lighting retrofits) may generate waste, which, if not properly managed, may be disposed in an environmentally not sound matter.		Environmental	P=3 I=3	The project will mitigate this risk by having a requirement for all investment proposals seeking for project support to include an adequate waste management plan incorporated into the project design. Environmentally sound waste management as it relates to the implementation of different energy efficiency retrofit works and disposal of related materials and appliances will be an issue to be addressed also, when supporting the Serbian municipalities to prepare their municipal energy efficiency action plans	Project team			
7.	Overlapping project activities with other donor funded projects leading to duplication, inefficient use of resources and “donor fatigue” of the targeted beneficiaries.		Organizational	P = 3 I = 3	This risk is sought to be mitigated by adequate stakeholder consultations with other donors both during the project preparatory and its implementation, so as to define and proceed with fully complementary rather than overlapping activities.	Project Board + project manager			

#	Description	Date identified	Type	Probability & Impact	Countermeasures / Mgt response	Owner	Submitted, updated by	Last Update	Status
8.	Lack of adequate co-ordination and co-operation on different sectoral policies, strategies and initiatives within and between the central government, local administration and private sector to effectively reach the stated goals.		Organisational	P = 3 I = 3	To be addressed by the Project Board and by facilitating such co-operation by engagement of different key entities in the implementation of concrete project activities.	Project Board			
9.	Lack of local capacity at the municipal and central government level to effectively implement EMS and EMIS.		Operational	P = 3 I = 5	The strong focus of the project on capacity building and vocational training as well as on establishing and implementing EMS and EMIS in Serbian towns and municipalities is expected to mitigate this risk.	Project Board + project manager			
10.	Inadequate and/or non-capacitated human resources within the core project team to successfully implement the project by adaptive management and support the mainstreaming of its results.		Operational	P = 3 I = 5	Recruitment of the key project staff based on competitive selection procedures emphasizing the qualifications and requirements set up in the ToR. Effective planning and day-to-day monitoring of the progress towards the set targets to complement the regular annual monitoring, including the use of international expert support to backstop and build up the local capacity for adaptive management and mainstreaming the project results when and as needed.	Project Board + RTA			
11.	Project duration too short to achieve the targeted results		Operational	P = 3 I = 4	Maintaining a possibility for at least one year project extension as an adaptive management measure, if required for achieving the intended project results	Project Board			

Annex 8.2. Letters of co-financing and support

The following co-financing letters are included as separate attachments:

1. Letter of co-financing from the Ministry of Mining and Energy dated 26 February 2015
2. Letter of co-financing from the Standing Conference of Towns and Municipalities dated 31 January 2015
3. Letter of co-financing from JICA dated 19 March 2015
4. Letter of co-financing from KfW dated 25 February 2015
5. Letter of co-financing from UNDP dated 23 February 2015

Letter of Support (without specification of co-financing amount):

1. Letter of support from the Ministry of Education dated 24 March 2015

Annex 8.3. Terms of Reference

Project Board

Duties and responsibilities:

The Project Board is the main body to supervise the project implementation in accordance with UNDP rules and regulations and referring to the specific objectives and the outcomes of the project with their agreed performance indicators.

The main functions of the Board are:

- General monitoring of project progress in meeting its objectives and outcomes and ensuring that they continue to be in line with national development objectives;
- To provide strategic leadership and serve as coordination mechanisms for various partners involved;
- Facilitating the co-operation between the different Government entities, whose inputs are required for successful implementation of the project, ensuring access to the required information and resolving eventual conflict situations raising during the project implementation when trying to meet its outcomes and stated targets;
- Supporting the elaboration, processing and adoption of the required institutional, legal and regulatory changes to support the project objectives and overcoming of related barriers;
- Facilitating and supporting other measures to minimize the identified risks to project success, remove bottlenecks and resolve eventual conflicts;
- Approval of the annual work plans and progress reports, the first plan being prepared at the outset of project implementation;
- Approval of the project management arrangements; and
- Approval of any amendments to be made in the project strategy that may arise due to changing circumstances, after careful analysis and discussion of the ways to solve problems.

Structure and Reimbursement of Costs

Project Board will be chaired by the National Project Director. Beside the Ministry of Mining and Energy represented by the National Project Director, the Board is expected to include representatives at least from the Standing Conference of Towns and Municipalities of Republic of Serbia (SCTM), Ministry of Education (MoE) and UNDP. The final list of the Project Board members will be completed at the outset of project operations and presented in the Inception Report. New members into the Board or participants into the Board meetings during the project implementation can be invited at the decision of the Board, by ensuring, however, that the Board will remain sufficiently lean to facilitate its effective operation. Project manager will participate as a non-voting member in the Project Board meetings.

The costs of the Board's work shall be considered as the Government's or other project partners' voluntary in-kind contribution to the project and shall not be paid separately by the project. Members of the Board are also not eligible to receive any monetary compensation from their work as experts or advisers to the project.

Meetings

It is suggested that the Board will have regular meetings, twice a year, or more often if required. A tentative schedule of the Board meetings will be agreed as a part of the annual work plans, and all representatives of the Board should be notified again in writing 14 days prior to the agreed date of the meeting. The meeting will be organized provided that the executing agency, UNDP and at least 2/3 of the other members of the

Board can confirm their attendance. The project manager shall distribute all materials associated with the meeting agenda at least 5 working days in prior to the meeting.

National Project Director

As a representative of the project's main Government Implementing Partner, the main duties and responsibilities of the National Project Director (NDP) include:

- Supervise and guide the project implementation directly as well as through the Project Board meetings chaired by the NPD by reviewing and commenting project progress reports and project implementation reviews (PIRs) and by meeting at regular intervals with the project manager;
- Coordinate the project activities with those of the Government and provide guidance on policy issues;
- Certifying the annual and, as applicable, quarterly work plans, financial reports and ensuring their accuracy and consistency with the project document and its agreed amendments;
- Taking the lead in developing linkages with the relevant authorities at national, provincial and governmental level and supporting the project in resolving any institutional or policy related conflicts that may emerge during its implementation.

Project Manager

Duties and responsibilities:

Operational project management in accordance with the Project Document and the UNDP guidelines and procedures for UNDP Direct Implementation Modality (DIM), including:

- Assume primary responsibility for daily project management - both organizational and substantive matters—ensuring that budgeting, planning and general monitoring of the project are in accordance with the Project Document and the rules and procedures established in the UNDP Programming Manual;
- General coordination, management and supervision of project implementation;
- Preparation of annual work plans and budgets with close monitoring of the overall project progress and conducting required adaptive management to reflect the changing circumstances and eventually emerging new opportunities;
- Managing the procurement and the project budget under the supervision of UNDP to assure timely involvement of local and international experts, organisation of training and public outreach, purchase of required equipment etc. in accordance with UNDP rules and procedures;
- Submission of annual Project Implementation Reviews and other required progress reports (such as QPRs) to the Project Board and the UNDP in accordance with the section “Monitoring and Evaluation” of the Project Document (with a close linkage to required adaptive management actions);
- Supervising and coordinating the contracts of the experts working for the project;
- As applicable, communicating with project's international partners and other donors and financing entities active in Republic of Serbia for leveraging additional financing for meeting the project objective and targets;
- Actively exploring opportunities for new partnerships and opportunities for co-ordination and co-operation with other EE related ongoing and planned activities in Republic of Serbia and abroad; and
- Ensuring otherwise successful completion of the project in accordance with the stated outcomes and performance indicators summarized in the project's results framework and within the planned schedule and budget.

Expected Qualifications:

In evaluating the candidates applying for the position of the project manager, it is to be taken into account that a committed, full-time project manager with adequate outreach and networking skills is absolutely essential for the success of the project. Therefore, a specific emphasis in the evaluation will be placed on the demonstrated and proven capacity and results of the applicants to: i) adaptive management; ii) engagement of the key stakeholders into constructive discussion about future development of EMIS and municipal energy efficiency in Republic of Serbia; iii) to guide and supervise the studies done and effectively co-operate with the international experts who are engaged to support this work; iv) to present their findings and recommendations in a convincing manner to key policy-makers and opinion leaders by taking into account the main macroeconomic and policy drivers for energy efficiency; and v) to identify areas of future work.

Contributing to the requirements above, the candidates applying for the position are expected to have:

- Advanced university degree and at least 10 years of professional experience in the specific areas the project is dealing with, including solid knowledge of the state-of-the-art approaches and best practices in catalyzing energy efficiency investments in the municipal sector;
- Experience in managing projects of similar complexity and nature, including demonstrated capacity to manage people and actively explore new, innovative implementation and financing mechanisms to achieve the project objective;
- Experience in working in Serbian public sector;
- Demonstrated experience and success in the engagement of and working with the private sector and NGOs, creating partnerships and leveraging financing for activities of common interest;
- Good analytical and problem-solving skills and the related ability for adaptive management with prompt action on the conclusion and recommendations coming out from the project's regular monitoring and self-assessment activities as well as from periodic external evaluations;
- Ability and demonstrated success to work in a team, to effectively organise it, and to motivate its members and other project counterparts to effectively work towards the project's objective and expected outcomes;
- Good communication skills and competence in handling project's external relations at all levels;
- Fluent/good knowledge of Serbian and English languages; and
- Familiarity and prior experience with UNDP and GEF requirements and procedures are considered as an asset

Project Assistant

Duties and responsibilities:

Supporting the project manager in the implementation of the project, including:

- Responsibility for logistics and administrative support of project implementation, including administrative management of the project budget, required procurement support, etc.
- Controlling project expenditures and maintaining up to date business and financial documentation, in accordance with UNDP and other project reporting requirements;
- Organizing meetings, business correspondence and other communications with the project partners;
- Provide logistical support to the project team and consultants working for the project in organising duty travel, meetings, workshops etc;

- Ensuring effective dissemination of, and access to, information on project activities and results and supporting the project outreach and PR activities in general, including keeping the project web-site up to date in co-operation with the project's IT expert;
- Managing the projects files and supporting the project manager in preparing the required financial and other reports required for monitoring and supervision of the project progress;
- Supporting the project manager in managing contracts, in organizing correspondence and in ensuring effective implementation of the project otherwise.

Expected Qualifications:

- University degree in economy or in the specific areas the project is dealing;
- Fluent/good knowledge of the Serbian and English languages;
- Demonstrated experience and success of work in a similar position;
- Good administration and interpersonal skills;
- Ability to work effectively under pressure.
- Good computer skills
- Familiarity and prior experience with UNDP and GEF requirements and procedures are considered as an asset

EMS and EMIS Support Unit

Mission

The EMS and EMIS Support Unit (hereafter referred to as ESU) will be established within the Ministry of Mining and Energy (or the Ministry having the main responsibility on energy efficiency in Republic of Serbia) to manage the central EMIS database and to co-ordinate and directly support as a “one-stop-shop” the:

- initiation and drafting of required complementary legal and regulatory acts to enable effective adoption and implementation of EMS and EMIS by Serbian municipalities;
- capacity building and provision of other required direct support to Serbian municipalities to facilitate adoption and effective implementation of EMS and EMIS at the municipal level, including further development of related software and provision of guidance for consistent data collection and reporting formats to facilitate the integration of municipal energy data into the central EMIS database;
- capacity building of the Serbian municipalities to use the information included in the EMIS for the preparation of municipal energy efficiency strategies and action plans and for structuring financing for their implementation;
- operational management of the Government financial support scheme(s) to encourage municipal EE investments (including the UNDP/GEF project grant resources allocated for that in accordance with the Letter of Agreement signed with UNDP and presented in Annex 8.9 of the project document); and
- public outreach, awareness raising and education on energy efficiency and establishment of public-private partnerships to encourage further development of energy efficiency in Serbian municipalities.

Expected results and related milestones

For the duration of the UNDP/GEF project, the expected results and related milestones of ESU will be consistent with those of the Project Results Framework. Further targets for ESU for the post-project period will be defined in consultation with the Ministry in charge for energy efficiency and presented in the project's exit strategy.

Management and staffing

For the duration of the UNDP/GEF project, the person in charge for the operational management of the ESU will be the project's Co-ordinating Officer recruited and paid by the UNDP/GEF project. He/she will report to the UNDP/GEF project manager working under the overall supervision of the Project Board, UNDP and the National Project Director. Other staff of the ESU supporting the Co-ordinating officer in his/her day-to-day work include the project's IT Associate (also recruited and paid by the UNDP/GEF project for the duration of the project) as well as the staff from the Energy Efficiency, Strategic Planning and other related departments appointed by the project's main counterpart Ministry as Government's in-kind contribution to the project to support and participate in the work of ESU. Such staff will include, among others, persons currently in charge of developing Government energy efficiency policies and strategies, managing Government financial support schemes for municipal EE investments, managing and supervising the implementation of EMS as per the existing Government legislation and managing the energy data collection and preparation of annual energy balances of Republic of Serbia.

The involvement of the staff already employed by the Government into the work of ESU is not aimed at fundamentally changing their current responsibilities and/or increase their current work load, but to find synergies, co-ordinate and eventually re-organise some of their works in such a way that they effectively serve and also use the new opportunities provided by effective introduction and implementation of EMS and EMIS at the municipal level. After the end of the UNDP/GEF project and the initial effort required for launching the EMS and EMIS, the Government is expected to facilitate further support for continuing the implementation of EMS and EMIS through ESU or otherwise. These further support (and staffing) needs will be assessed during project implementation and are to be addressed in the project's exit strategy (Output 4.6)

Co-ordinating Officer (full-time)

Duties and responsibilities:

- Supporting the project manager in delivering the agreed project outputs and meeting the project targets with a specific responsibility in facilitating, managing and co-ordinating the support offered to the Serbian municipalities by the EMS and EMIS Support Unit (ESU) to be established within the Ministry in charge of energy efficiency;
- As a part of the above, proactively contacting the Serbian municipalities and provide other support to facilitate the adoption of EMIS and ensure its sustainable implementation by at least 30 municipalities by the end of the project;
- Preparing and co-ordinating the implementation of the annual public calls for proposals for the project financial support scheme for investments, including provision of technical backstopping for evaluation of the proposals received;
- By regular field visits to the municipalities that have adopted EMS and EMIS, facilitating and supervising their proper implementation and providing other technical backstopping, as requested by the municipalities wishing to benefit from the project support;
- Establishing and operating the EMS/EMIS hotline as one of the services of the EMS and EMIS Support Unit within the Ministry;
- Co-ordinating the data collection for and management of the central EMIS database to be established within the Ministry with the other energy related data gathering and management activities of the Government of Serbia (such as the preparation of the annual Energy Balances) so as to avoid overlapping activities, full access to, exchange and consistency of the data gathered and its storing and processing in a format that can be used to serve all reporting needs of the Government as it concerns any public sector energy use;
- Providing guidance for and reviewing the annual monitoring reports prepared by the municipalities that have taken EMIS into use to ensure their consistency in terms of the reporting formats and accuracy of the data provided;

- Analysing the data obtained through EMIS and defining the indicators and benchmark values to be included into EMIS, on the basis of which the municipalities can assess their energy performance
- Providing technical backstopping for the preparation of municipal EE strategies and action plans with support provided to and finalized reports with clearly defined EE targets by at least 30 municipalities by the end of the project;
- Contributing to the preparation of annual work plans, Terms of Reference and project progress reports (with related adaptive management planning) as well as of any public outreach and training materials as it concerns any activities implemented by or through the ESU;

Expected Qualifications:

- Advanced university degree in energy related technical areas the project is dealing with and at least 8 years of professional experience on energy efficiency and/or energy management related matters, including economic and financial aspects;
- Experience in managing activities of similar complexity and nature, including demonstrated capacity to actively explore new, innovative implementation and financing mechanisms to achieve the project objective;
- Demonstrated experience and success in the engagement of and working with the private sector and NGOs, creating partnerships and leveraging financing for activities of common interest;
- Ability and demonstrated success to work in a team, to effectively organize it works and to motivate its members and other project counterparts to effectively work towards the project's objective and expected outcomes;
- Good communication skills and competence in handling project's external relations at all levels;
- Fluent in Serbian and English languages

IT Associate (full time)

Duties and responsibilities:

- Day-to-day management and further development of the EMIS software, including IT support and provision of timely technical backstopping to its users;
- Organize training for and train personally the users of EMIS both at the central government and municipal level, including preparation of on-line tutorial and training materials;
- Supporting the project manager and ESU co-ordinating officer in drafting Terms of Reference and technical specifications for any IT related procurement (including hard and software and related consultant services) and, as applicable, in related contract negotiations;
- Managing and further developing the central EMIS database, including storing, further processing and quality control of the data fed into the system and actively exploring the opportunities and making recommendations for simplifying the procedures, automatization, co-ordination and harmonization of the Government energy data gathering activities from the Serbian municipalities in general (including co-operation with the Ministry staff in charge for gathering and processing municipal energy data);
- Ensuring system safety and adequate back-up arrangements;
- Developing and regularly maintaining and improving the project and ESU website(s) for public outreach, information sharing and training purposes; and

- Providing other technical backstopping for and supporting the project team in any other IT related matters, as requested by the project manager.

Expected Qualifications:

- Advanced university degree in IT technology and/or programming and at least 8 years of professional experience, including in-depth experience on programming with ORACLE and working with other database programs;
- Good interpersonal and training skills;
- Good analytical and problem-solving skills;
- Good communication skills and competence in handling project's external relations at all levels; and
- Fluent in Serbian and English languages

Legal Expert(s) (part time)

Duties and responsibilities:

- Identify possible legal and regulatory barriers to the targeted outcomes and outputs of the project;
- Based on the identified legal and regulatory support needs, identify appropriate legal and regulatory frameworks and documents for suggested changes and drafting those amendments for further consideration of the Government (including any amendments or required new regulatory documents for implementing the project financial support scheme for investment) by taking into account international experiences lessons learnt;
- provision of training in the legal/permitting procedures for the suggested EE demonstration projects;
- provision of assistance and legal advice on organising the tender and preparing tender documents for the project financial support scheme as well for any other procurement related activities of the project;
- Support the other project experts in clarifying the specific legal requirements, possible obstacles and requirements in implementing the planned pilot projects to be supported by the GEF funds.

Expected Qualifications:

- Advanced university degree in Law and at least 7 years of professional experience or in the specific areas the assignment is dealing with, including good knowledge of the legal and regulatory framework influencing the specific outcomes and outputs of the project;
- Experience in drafting legal and regulatory documents in the project related fields;
- Extensive experience in public tendering regulations and procedures in Republic of Serbia;
- Good analytical and problem-solving skills;
- Good communication skills and competence in handling project's external relations at all levels; and
- Fluent/good knowledge of Serbian and English languages.

International project adviser (part-time)

Duties and Responsibilities:

Support UNDP and the project management in monitoring the progress of the project and its different sub-components and, as needed, build the capacity of the local experts working for the project to successfully

implement the project activities, ensuring that they comply with the agreed benchmarks and success indicators of the project as well as international best practices and lessons learnt. The expected level of involvement will be 20-40 days (including 2-4 missions) per year, which may gradually decrease towards the end of project implementation depending on how the project proceeds.

The specific responsibilities include, among others, to:

- support the local project management team in organising the implementation of the project's different sub-components at the inception phase, including support to the project manager in the preparation of the project inception report and the annual output specific work plans, drafting of Terms of Reference for the national and, as needed, additional international experts and subcontractors, required tender documents etc;
- support adaptive management by annually (or semi-annually) reviewing the progress of the project and its different subcomponents and making suggestions for eventual changes and/or complementary activities;
- propose methodologies and specific software models for market monitoring and for assessing the GHG reduction impact of the project and its outputs;
- by building on international experiences and lessons learnt from promoting municipal energy management and information systems and related low and no carbon investments, contribute with policy recommendations to the implementation of activities under outcome 1 of the project;
- support the project manager in supervising the work of the contracted individual experts and companies, including review of the feasibility studies and the technical design, financing and implementation arrangements of the planned pilot projects;
- support the project manager in arranging co-operation with the already identified key stakeholders and, as applicable, support the identification and establishment of new national and/or international partnerships and to support the project goals and objectives; and
- support the local project team in monitoring and evaluating the performance and the outcome of the pilot projects under implementation.

Expected Qualifications:

- a university degree in the project related field;
- demonstrated experience and success in supporting similar projects (or its sub-components)
- good knowledge of international experiences, state of the art approaches and best practices in the specific areas the project and its subcomponents are dealing with;
- good analytical skills and effective communication and training skills and competence in handling external relations at all levels;
- ability to work in a team and to motivate other team members and counterparts; and
- fluency in English.
- familiarity with UNDP and GEF requirements is considered as an asset.

Annex 8.4 Stakeholder Involvement Plan

Stakeholder	Envisaged role and potential areas for co-operation during project implementation
Central government administration and related organisations and companies	
Ministry of Mining and Energy	The main project partner and Government counterpart to host the Energy Management Support Unit to manage and to co-ordinate the EMS and EMIS related activities at the state level. Also to implement the project investment grant component following the UNDP guidelines for nationally implemented projects together with the management of Government's own incentive and co-financing schemes to support EE investment projects in Serbian municipalities
Ministry of Education	Envisaged key stakeholder on educational sector activities under Outcome 4.
Ministry of Construction	Will be included in all relevant project activities
Local (municipal) administration and related organisations and companies	
Standing Conference of Towns and Municipalities	A representative of the Serbian municipalities and a key project partner to support the introduction and implementation of EMS and EMIS at the municipal level with the related outreach, networking, co-ordination and training activities through its working committees and otherwise. Also participating in the legal and regulatory work by reviewing and commenting draft regulations.
Regional Development Agencies	Possible project partners at the regional level
Regional Energy Efficiency Centers	Availability of technical experts to support the project implementation
Local municipal administrations and energy management offices	Key project counterparts at the municipal level
Energy and Environment related NGOs and professional associations	
Chamber of Commerce	Envisaged project partner for engaging private sector
Universities and other scientific, research and educational entities	
Local universities and other research and educational entities	Training organisation and facilities
Public/private companies and investors	
EPS (Elektroprivreda Srbije)	Envisaged project partner for metering related activities
Local distribution companies	Envisaged project partners for metering and training related activities
International organisations and financing entities	
EBRD	By the financing mechanism initiated and financed by EBRD such as the Western Balkans Sustainable Energy Financing Facility (WeBSEEF) possible source of financing for municipal EE investments
EU / IPA	Envisaged co-operating opportunities in the legal and regulatory framework development, in particular
GIZ	With the new GIZ funded project envisaged to focus on schools, possible co-operation opportunities in that segment of the municipal energy use and management
JICA – Japan International Cooperation Agency	In the frame of the ongoing project for "Assistance of Enhancement of Energy Management System in Energy Consumption Sectors in the Republic of Serbia"

	supported by JICA, foreseen co-operation opportunities in the area of training and capacity building.
KfW	By the financing mechanism initiated and financed by KfW such as the Municipal Environmental Grant Loan Investment Programme (MEGLIP), possible source of financing for municipal EE investments KfW
Government of Norway	Opportunity to build on some of the past activities supported by the Government of Norway. Further co-operation opportunities to be clarified during project implementation.
UNDP	Co-ordination with other UNDP implemented, GEF financed climate change projects such as the ongoing “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia” also touching the municipal energy use and supply

Annex 8.5 Greenhouse Gas Emission Reduction Analysis

Background

The GHG emissions reduction analysis of the project has been prepared by taking into account the updated methodology for “Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects, Version 1.0” published by the Scientific and Technical Advisory Panel of the Global Environment Facility (GEF-STAP) in March, 2013²⁷. The study was commissioned by the GEF Secretariat in 2012 to review the previous guidance from 2008²⁸ and to develop a revised methodology/algorithm for calculating GHG benefits of GEF EE projects with an intent “to improve the rigor and consistency of the GHG analysis, and to simplify the application of the methodology for GEF agencies, by providing a more complete, and easy-to-use spreadsheet tool that embeds more standardized guidance in the form of algorithms and conservative default factors.” As of January 2015, the methodology included four modules to choose from for different type of interventions, namely: 1) standards and labelling, 2) building codes, 3) demonstrations and diffusion and 4) financial instruments. The spreadsheet also enables project proponents to combine multiple activity components (up to 10 within each module), with reporting of results for individual components as well as cumulatively for the entire project.

The Municipal Energy Management and Information Systems (EMS or EMIS) promoted in the frame of this project have some unique characteristics, which make it difficult to apply the spreadsheets developed for the updated GEF GHG calculation methodology directly. The energy saving and GHG reduction benefits from successful introduction of EMS can typically be attributed to a great variety of small and big EE investments in public buildings and public utility services, complemented by many low- and no costs behavioural and operational changes, which the EMS/EMIS has been encouraging and/or for which it has leveraged funding. Trying to predict the type and respective share of these interventions is associated with major uncertainties, which task in prior to the broad scale adoption of EMIS is further complicated by the scarce baseline information typically available from public sector energy use. In line with the accounting methodology of international energy statistics (such as EUROSTAT and IEA), the public sector energy use in the National Energy Balance of Republic of Serbia is included in the category of “Others” together with the commercial sector and eventual other energy users.

More detailed data has been collected and is available from a few municipalities, but even this data demonstrates such a great variability in the average specific energy consumption of buildings constructed basically for similar purpose (see table 8.2 for further details) that with such a small sample, it does not really justify the use of this data as a basis for common average default values for public buildings and other public sector energy use.

Given the above, the suggested approaches of the updated GEF methodology have been used whenever possible, but in a somewhat adapted form by using the combination of top-down statistical analysis with bottom-up verification and vice versa. In the case of substantial deviations from the suggested GEF methodology or default values, an explanation is provided in the narrative.

Eventually the most comprehensive and relatively recent analysis of the energy saving potential of the public sector buildings was financed by the World Bank in 2012 with the results published in the report “National Building Energy Efficiency Study for Serbia” (World Bank, October 2012). As a basis for the estimates made, the study collected available statistical information on the entire building stock in Republic of Serbia,

²⁷ <http://www.stapgef.org/revised-methodology-for-calculating-greenhouse-gas-benefits-of-gef-energy-efficiency-projects-version-1-0/>

²⁸ GEF/C.33/Inf.18, Manual for calculating GHG benefits of GEF projects: EE and RE projects, April 2008

complemented by information obtained from a sample of walk-through energy audits. Some key results of this work are summarized in table 8.1 below.

Table 8.1 Estimated energy saving and related investments costs of selected public sector buildings per m², kWh saved and tons of CO_{2eq} reduced²⁹

Building type	Share	Baseline consumption	Savings potential		Required Investments per kWh saved and CO ₂ reduced			
						Annual	With 15 yrs default lifetime	
					EUR/m ²	EUR/kWh	EUR/kWh	EUR/tCO _{2eq} reduced
Educational facilities	41.3%	213	44%	93.72	38.3	0.41	0.027	71.8
Health and social care	14.7%	308	47%	144.76	49.2	0.34	0.023	59.7
Public offices	44.0%	154	47%	72.38	46.8	0.65	0.043	113.6
Weighted average	NA	201	46%	92	44	0.50	0.034	88

When verifying these results with other available building and municipality specific data, however, it can be noted that there are significant differences even within the same building category depending on the age, location, condition and/or accuracy of the data obtained. This is illustrated in table 8.2 below showing the monitored data from three selected municipalities obtained during the UNDP/GEF project preparatory phase.

Table 8.2 Specific energy consumption of public buildings in three municipalities calculated on the basis of aggregated building specific data and compared with the WB study and the top-down analysis made during the UNDP/GEF project preparation.

Comparison by sources	Energy consumption for heating (kWh/m ²)					Electricity consumption for other uses (kWh/m ²)				
	WB study	Nis	Vrbas	Varvarin	Top down	WB study	Nis	Vrbas	Varvarin	Top-down
Administrative buildings	154	147	220	219	144	90	67	204	43	60
Educational entities	213	127	200	145		20	30	20-80	12	
Health and social care	308	112	244	135		91	77	90-190	79	
Others	NA	88	NA	NA	NA	NA	75	NA	NA	NA
Weighted average	201	116	150	154	144	61	49	59	31	60

Methodology used in the analysis

Similar to the initial 2008 and the updated 2013 GEF methodology, the GHG emissions reductions are divided into direct and indirect GHG reduction benefits. No direct post-project impact has been considered in the analysis since the GEF resources will be used as one-time capital grant without expected pay-back: i.e. no new loan or loan guarantee mechanism will be created with the GEF funds.

²⁹ The estimates on specific annual baseline energy consumption, energy saving potential and related investment needs for achieving those saving are based on the National Building Energy Efficiency Study for Serbia, financed by World Bank in 2012, while the corresponding GHG reduction impact has been calculated on the basis of the emission factors reassessed during the project preparatory phase.

As defined in the updated GEF methodology, the **direct GHG emission reductions** “are those achieved by project investments such as technology demonstrations and discrete investments financed or leveraged during the project’s supervised implementation period”. In addition, policy implementation activities supported by the project such as building codes, standards and labelling components leading to building EE improvements and equipment purchases prior to the project closure are now explicitly capable of generating direct emissions benefits. Similarly, this should apply for purchases done during the project implementation period by revised public procurement guidelines applying new minimum energy performance standards, should the development of these guidelines have been directly supported by the GEF project.

By taking into account the above, the GHG reduction assessment of this project has been considering as direct GHG emission reductions:

- 1) the estimated CO₂ reduction from investment projects supported directly with GEF grant funding in accordance with the draft criteria elaborated in chapter 2.1 under outcome 3 and
- 2) the estimated CO₂ reduction from investment projects without direct GEF cost-sharing for actual investment, but for which the financing has been leveraged by project’s technical assistance activities during the UNDP/GEF project implementation period.

For the first category of projects, the suggested criteria for GEF grant support under outcome 3 is limiting the GEF grant support to USD 10 per estimated ton of CO₂ reduced during the lifetime of the project. This, combined with the total allocated GEF resources of USD 500 thousand for the proposed grant scheme will result in the **minimum target for direct GHG emission reduction of 50 ktons of CO_{2eq}**. The co-financing of these projects is expected to reach USD 2.5 – 4.5 million in total by taking into account the suggested limit of maximum GEF contribution of 20% of the total investment on the one hand and the average required total investments costs of about USD 100 (EUR 88) per ton of CO₂ reduced, as calculated on the basis of the WB study results (see table 8.1 for further details). This leaves at least USD 10 million from the targeted total co-financing of component 3 to be leveraged during the project implementation for other investment related activities.

By applying the same estimate derived from the WB study for the average required total size of EE investments in public buildings per ton of CO_{2eq} reduced (approximately USD 100/tCO₂, as already mentioned before), **the resulting direct impact from this second category of investments has been estimated at 100 ktons of CO_{2eq}**. Eventual complementary direct GHG reduction benefits could be obtained for the purchases done during the project implementation by new public procurement guidelines including more stringent minimum energy performance standards to the extent the development and adoption of such guidelines has been supported by the project’s technical assistance activities. For the time being, however, there is not enough basis to include this into the estimates yet. **As such, the total direct GHG reduction target of the project from investments with direct GEF cost-sharing and from those, for which the project has leveraged financing otherwise by its TA activities, is set at 150 ktons of CO_{2eq} calculated over a 15 year default lifetime of the investments made.**

Indirect GHG emission reductions are those that result, for instance, “from market facilitation and development through project-supported policy and institutional frameworks, capacity building, information gathering, and replication effects of demonstration activities”. This can be calculated based on a bottom-up or top-down approach. For projects involving demonstration and diffusion activities, or the use of investment instruments, the indirect GHG emission reduction following the **bottom-up approach** can be calculated on the basis of the expected replications during the post-project influence period (typically 10 years). The **top-down estimate** is based on a single market potential analysis by multiplying the total market potential by the GEF project causality factor (CF).

Table 8.3 GEF project causality factor for estimating the indirect project impact

Level 5 = 100 %	The GEF contribution is critical and nothing would have happened in the baseline.
Level 4 = 80 %	The GEF contribution is dominant , but some of this reduction can be attributed to the baseline.
Level 3 = 60 %	The GEF contribution is substantial, but modest indirect emission reductions can be attributed to the baseline.
Level 2 = 40 %	The GEF contribution is modest , and substantial indirect emission reductions can be attributed to the baseline.
Level 1 = 20 %	The GEF contribution is weak , and most indirect emission reductions can be attributed to the baseline.

For **indirect GHG emission reduction bottom-up estimates**, it has been assumed that the effective introduction and implementation of EMS and EMIS in Serbian municipalities would leverage at least USD 200 million of complementary financing for municipal energy efficiency investments within 10 years after the project end. By using the same default value of the required total size of the investment per ton of CO₂ reduced as in the project's direct GHG reduction estimates (namely USD 100 per ton of CO₂ reduced), **the indirect project impact based on a bottom-up approach could be estimated to be at least 2 million tons of CO₂**. It is also to be noted that this does not account for any low- and no cost behavioural and operational changes yet, which can significantly increase the achieved savings.

For **indirect GHG emission reduction top-down estimates**, the Energy Balance of 2012 has been used as a reference point. The final energy consumption of the public sector has not been presented separately in the energy balance, but is included into the category "Others" (Table 8.4).

Table 8.4 Energy Balance 2012 – Final Energy Consumption (TJ)

Sector	Natural gas	Oil and oil products	Electricity	Heat	Coal and coal products	Geothermal energy	Wood	Total
Industry	28 169	23 208	23 810	10 355	14 485	-	2 828	102 855
Construction	-	1 414	1 141	-	45	-	146	2 746
Transport	165	74 328	1 771	-	-	-	-	76 264
Households	9 047	3 947	52 261	16 917	12 865	-	7 292	102 329
Agriculture	766	5 452	1 112	-	17	156	130	7 633
Others	4 597	4 658	17 705	3 268	7 248	104	241	37 821
Total	42 744	113 007	97 800	30 540	34 660	260	10 637	329 648

By further taking into account the available statistics on the existing buildings stock and its distribution between the residential, public and commercial buildings (table 8.5) as well as the estimated final energy consumption of other municipal services such as street lighting, water and heat supply, a rough top-down estimate for the energy balance of the public sector energy use is presented in table 8.6.

Table 8.5 Republic of Serbia building stock in 2011³⁰:

Type of building	Floor area (1000 m ²)
Residential single family buildings	121,000
Residential multi-apartment buildings	69,000
Residential buildings all	190,000
Educational facilities	11,250
Health and social care	4,000
Public offices	12,000

³⁰ National Building Energy Efficiency Study for Serbia, World Bank/Econoler, October 2012

Public sector sub-total	27,250
Hotels	7,000
Offices	5,500
Trade	4,500
Others	1,000
Commercial sector subtotal	18,000
Others (mixed)³¹	8,000
TOTAL	243,250

Table 8.6 Approximated allocation of the public sector energy use in 2012 (without public transport)

Sector	Heating			Electricity used for other than space heating	
	TJ	GWh	kWh/m2	GWh	kWh/m2
Public and commercial sectors	27,690³²	7,692	144	4,180	60
Street lighting				507 ³³	NA
Other public utility services	3,579 ³⁴	994		500 ³⁵	NA
Public and commercial buildings, of which:	27,690	7,692	144	3,173	
Commercial buildings		2,600 ³⁶	144	1,073	60
Public buildings		5,092 ²⁷	144	2,101	60

While the MoME Energy Balance 2012 of the final energy consumption for the category “Others” has been used as a starting point for the figures presented in table 8.6, several assumptions with relatively high error margin had to be made during the analysis. This is primarily because of the absence of systematically measured and monitored energy consumption data from the public and commercial sector, which would show the energy use of the different energy user categories of these sectors at the adequate level of detail. For the purpose of assessing the indirect GHG reduction impact of the proposed project based on a top-down approach (including several other uncertainties as well), however, the figures presented in table 8.6 are expected to provide an adequate basis for the initial estimates of the baseline GHG emissions of the public sector energy use.

By further taking into account the type of fuels used for on-site heating equipment (such as stoves and boilers) in the public sector and the type and amount of fuels used in Serbian district heating and thermal power plants (as per the Energy Balance of 2012 and summarized in tables 8.7 and 8.8), the baseline GHG emissions of the public sector energy consumption in 2012 (excluding public transport) were calculated to be about 5.4 Mtons of CO_{2eq} in 2012, of which 2.1 Mtons from space heating and 3.3 Mtons from electricity consumption for other than space heating purposes.

³¹ Including sport facilities, cultural centers, libraries etc., which in this analysis have been all considered as public buildings

³² From MoME Energy Balance 2012 by assuming that all direct fuel use together with heat and 15% of electricity in the final energy consumption category “Others” is used for space heating of public and commercial buildings

³³ EPS Technical Report 2012

³⁴ Including own use and estimated losses of DH plants, as presented in the MoME Energy Balance 2012

³⁵ Own estimate

³⁶ In the absence of better information allocated based on the known floor space of each sector

Table 8.7 Electricity generation, fuel consumption and emissions in 2012³⁷

Balance of power generation	Amount (GWh)	Fuel consumption by TPPs in 2012	Energy content (TJ)	GHG emissions MtCO _{2eq}
Hydro Power	9,914	Coal and coal products	279,491	28.23
Thermal Power Plants (Condensing)	26,275	Oil and oil products	3,993	0.31
Combined Heat and Power (CHP)	439	Natural gas	10,333	0.58
Autoproducers	171	Total	293,817	28.54
Import	5,781	Average emission factor for consumed electricity (taking into account transmission and distribution losses)		1.055 tons of CO_{2eq}/MWh³⁸
Export	-5,392			
Power sector own consumption	-4,412			
Transmission and distribution losses	-5,609			
Total domestic net electricity supply	27,167			

Table 8.8 Heat generation, fuel consumption and emissions by DH plants in 2012³⁹

Balance of heat generation by district heating (DH) plants	Amount (TJ)	Fuel consumption by DH plants in 2012	Energy content (TJ)	GHG emissions MtCO _{2eq}
Total heat generation (boiler output)	22,396	Coal and coal products	3,016	0.305
Own consumption	-1,709	Oil and oil products	3,702	0.287
Losses	-1,870	Natural gas	20,270	1.135
Heat delivered to consumers	18,817	Wood	73	-
		Total	27,061	1.726
		Average emission factor for consumed heat (taking into account the distribution losses)		0.330 tons of CO_{2eq}/MWh

Table 8.9 Estimated annual emissions of public sector energy use (without public transport) in 2012

Annual baseline energy consumption and GHG emissions in 2012	Heat	Electricity	Heat	Electricity	Total
	GWh	GWh	MtCO ₂	MtCO ₂	MtCO ₂
Public buildings	5,092	2,101	1.932	2.207	4.139
Street lighting		507		0.533	0.533
Other public utilities		500		0.525	0.525
DH supply heat losses and own use	520		0.197		0.197

³⁷ Electricity generation and fuel consumption data from MoME Energy Balance 2012. GHG emissions calculated by using the IPCC 2006 emission factors

³⁸ The default grid emission factor suggested in the GEF Calculation Modules for Serbia is 1.123 tons of CO_{2eq}/MWh

³⁹ Electricity generation and fuel consumption data from MoME Energy Balance 2012. GHG emissions calculated by using the IPCC 2006 emission factors

Total	5,611	3,108	2.129	3.264	5.394
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For estimating the indirect GEF project impact based on a top-down approach, it was assumed that by gradual adoption and effective use EMS and EMIS systems in the Serbian municipalities encouraging both behavioural and operational changes as well as actual EE investments, the public sector energy consumption nation-wide could be reduced by an incremental 1% per year⁴⁰ after the expected end of the project in 2020 for both space heating and electricity, calculated on the basis of the estimated public sector energy use and related GHG emissions in 2012 (Table 8.9). This would result in cumulative GHG reduction of about 3 million tons of CO_{2eq} by 2030 i.e. 10 years after the expected end of the UNDP/GEF project (Table 8.10).

Table 8.10 Estimated annual and cumulative GHG reduction after the end of the project as an indirect project impact .

Year	CO2 reduction (MtCO2eq)
2021	0.054
2022	0.108
2023	0.162
2024	0.215
2025	0.269
2026	0.323
2027	0.377
2028	0.431
2029	0.485
2030	0.539
Mtons of CO2 (cumulative by 2030)	2.962

Alternatively, the indirect GHG reduction impact of the project following a top-down approach can be calculated based on the mentioned 1 % reduction over 15 years default lifetime of the EE investments and other measures facilitated by the EMS and EMIS resulting in cumulative GHG reduction of about 8.1 million tons of CO₂ (10yrs x 15yrs x 0,054 Mtons) or 3.9 million tons by using a causality factor of 40%.

⁴⁰ On the top of the expected baseline energy intensity (energy efficiency) improvement of 2% for electricity and 1 % for other energy use in line with default values of the updated GEF calculation methodology for GHG reductions.

Annex 8.6 Lessons Learnt from the UNDP-GEF Energy Efficiency Project in Croatia

The content of Annex 8.6 is based on the Lessons Learned Report of the UNDP-GEF Project: “ Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors” implemented in Croatia in 2005-2011. The report was compiled for UNDP Croatia in January 2012 by Zoran Morvaj and Dunja Fadljević as the main authors with an objective to serve the formulation and implementation of similar projects in the future.

As stated in the forewords of the report by John O’Brien, the UNDP/GEF Regional Technical Advisor working with Croatia at that time: “The project was different from many in that it has succeeded in making energy efficiency an important priority in the Republic of Croatia. This is so because the project itself acted as a “catalyst of change”, promoting and transforming a culture into a situation whereby energy efficiency as a priority has become part of the institutional structure of government both at national and regional levels”. Furthermore, the project was commended “for taking adaptive management seriously”, which is essential to the success of any project, but the efficiency and effectiveness of which greatly varies from one project to another, largely depending on the commitment, vision and professional capacity of the key project stakeholders, the project management as well as the supporting donor organisation(s).

Some **key observations and recommendations** summarized later in the report and to be considered during the implementation and/or design of similar projects include, among others, the following:

- **“Improving energy efficiency (EE) is a process of change**, because it requires changing attitudes to energy use – and this is the most difficult thing about EE. To achieve such change, there is a need to think and act in terms of processes and continuity rather than in terms of discrete events leading to certain emissions reductions and kWhs saved”;
- **Improving energy efficiency is a complex process**, which complexity “arises from the variety of stakeholders (external ones, including ministries, cities, counties, consultants, manufacturers, banks, utilities, the public, academia, and internal stakeholders), their interrelationships and interdependencies, structures and ideas, and the events they produce. These create an uncontrollable environment with lots of variables and shifting goals and targets.” In such a case, “seeing the whole” may become a problem. **“As a way of management, the focus should be more on the process itself” with a clear change strategy “rather than on the specific tasks or outcomes”;**
- **“As time goes by, things change** (internally and externally) and new realities emerge, requiring people to adapt. As a consequence, pre-planned activities and outputs cannot be rigidly maintained, **and adaptive management is a must”;**
- **“There are various technological, institutional, legal, policy and financial barriers, but in all of them it boils down to people.** People can operate only the technological solutions they understand, are trained for and feel comfortable with. The same goes for all the other barriers. Therefore, awareness raising, capacity building and developing competences are the prime tasks for any development project”;
- **“Ice breaking”** – no project comes to life in a perfect environment. There are always on-going activities, relationships, power games, broken promises and struggles for influence in the environment in which a new project has to start delivering. A big challenge is how to establish the project legitimacy and how to make clear that “we are different, if indeed we are”;
- **“Dress to impress”** – the project needs to behave and perform in a “best in class” manner and continuously strive for excellence. Only a reputation of real competence can help the project sail through all the ambiguities, uncertainties and even to overcome outright hostility.
- **“Traditional classroom based education can have only a modest role in developing competences.** Usually, with EE capacity building, there is a tendency to focus on technical and financial solutions supported by events (workshops) and there is commonly a lack of appreciation of the importance of focusing on people and creating

processes that spur the implementation of solutions. The development of competences must be integrated into daily work, must be experimental, and must be responsive to changing needs”;

- **Too much emphasis on policies and research neglecting the implementation.** “Those who are supposed to do the implementation do not have faith in the data, they question the design, and they have problems adapting it to their situation. The data and design often do not get beyond the reports that summarise them, and as a consequence implementation very often never gets done, or in the best case is done only partially.” ... “One of the key reasons for such a situation is the unbalanced amount of efforts invested in policy development as opposed to policy implementation. Huge efforts are invested into the development of many regional and national policies and subsequent programmes. However, there is very little focus and effort invested in HOW to implement policy measures”;
- “It seems that there is a general expectation that implementation is straightforward, that it will hopefully happen by itself, hence there is no need to put too much effort into it. As a consequence, results are persistently missing or reflect underachievement”.

For the **project preparation stage**, the report emphasized, among others, the following:

- “Particularly for EE types of project, **understanding the status of the EE market** is of critical importance because it is a vantage point for determining the right mix and timing of project tools and interventions”;
- “It is important not just to recognise and describe the symptoms, but **to understand the underlying causes of the detected problems**. Key interventions should be directed towards institutional and professional capacity and competence building. There is **no point in providing free energy audits prior to developing capacities** to implement the EE improvement measures. There is **also no point in providing financial instruments prior to developing demand for EE loans** through a public promotion and awareness campaign, etc.”;
- “To achieve true capacity development takes a lot of time. For strategic change projects, it makes no sense to programme for a period of less than five years”;
- “Provisions for knowledge management, scaling up, and exit strategy and sustainability must be included and elaborated in the project preparatory stage”

“During the **inception phase**, it is very important to develop an up-to-date understanding of the project implementing environment, the roles of key stakeholders and their capacities, and important power brokers and their mandates. The inception phase must assure that the project is still relevant, important, implementable and beneficial to the country” “Moreover, the key market players, both on the supply and demand side, with their roles, responsibilities, capacities and competences, have to be understood.

“The fact that introducing energy efficiency is actually bringing in a process of change should be recognised and reflected upon in the inception phase. Consequently, strategic decisions on the project implementing approach should be made. These should include the following considerations:

- How to build legitimacy, connections and trust with project partners;
- How to include a diverse perspective to devise actions that work for all target groups;
- How to mobilise stakeholders, initiate project activities and later scale up actions;
- How to access expertise and knowledge;
- How to capture and manage the knowledge created during project implementation.”

“Attempting EE market transformation means embarking on a complex process of change, which involves multiple stakeholders. Their relationships and interactions thus create an ever-changing or emerging project environment. A corresponding project intervention strategy must be devised.”

The project intervention strategy in the Croatia project was based “on initiating EE market transformation by stimulating demand for EE products and services in the public and residential sectors by raising public

awareness and by building the capacities and competences of local authorities necessary to implement the EE measures.” An energy management system (EMS) was adopted as an implementing platform for this.

“The **implementation approach** adopted for the Croatia EE project rested upon:

- Addressing the issues that were current priorities for the government (accession to the EU);
- Introducing systematic energy management in cities as the universal project implementing platform;
- Engaging with top-level decision makers and politicians (mayors, prefects, ministers, state secretaries)
- Developing and providing free of charge an IT tool for energy management – the Energy Management Information System (EMIS);
- Promoting the public sector “leading by example” approach, and introducing Green Office and Green Procurement practices in city administrations;
- Running a three-year national public promotion and awareness campaign to stimulate demand for EE products and services, including free telephone hotlines for EE advice;
- Introducing EE info centres throughout cities in Croatia where citizens can receive free advice on EE, including providing training for EE advisors;
- Introducing EE corners in shopping centres where EE materials and equipment are on sale, to bring supply and demand closer together;
- Setting high standards for quality, visibility and recognition of project competences in order to gain trust and legitimacy;
- Viewing the introduction of EE as a process of change;
- Developing people and their competences at every level, internally and externally on-the-job;
- Stimulating innovation, public entrepreneurship and a knowledge culture;
- And finally but not less important – securing the full support from the UNDP Country Office and setting up such an implementation structure as much as possible an integral part of one UNDP.”

“Any project implementation is happening within an organisation with a corporate structure, set of rules, policies and procedures aimed both at supporting project teams in implementation and at securing accountability and reputation (legitimacy) of the organisation. The latter is particularly important in door-opening and keeping positions at the high-level negotiations (securing national co-financing and national-level support in this project case), it allows risk-management and accepting financial risks in critical periods (bridging gaps in financing), it opens more communication channels and better visibility for the project, it secures protection at times when stakeholders, partners or vendors are not happy and strike back in anger with unjustified complaints. **Thus it is important for any project to be firmly embedded within a Country Office structure and to have a productive relationship and support of key CO personnel (senior management, operations team, communications team, programme).”**

It is very important for the project to gain trust in its competences and understanding – that it shares understanding of the issues and commitments for action and is actually capable of doing what it says it will do. “To achieve this requires the right mix of resources, skills, relationships and clear communication. The project team had to grow its own capacities and competences required for success. Consultants were used only for very specific tasks, but not for managing operations nor for supporting the project partners (cities and counties). In this way, the project was able to achieve and maintain legitimacy, relevance and an appropriate level of quality, because we cared”.

The experience showed that “there were two distinctive aspects of managing the implementation of complex and large development projects:

- i) External – managing relationships with beneficiaries, project partners, subcontractors, and executing the project implementing strategy;
- ii) Internal – managing the project team and the relationship with the UNDP country office.”

For external relations, “the real place for implementation was in the cities and counties where energy is actually used. Developing implementing capacities at the local level for embracing full-scale energy management systems in public service was therefore the most important part of the project interventions. Implementation at the local level would not happen without an appropriate institutional setup, capacities and strong proactive leadership in policy implementation, i.e. without:

- Securing enduring political will to implement policies;
- Developing adequate implementing capacities;
- Securing appropriate resources and competences;
- Developing IT infrastructure to monitor, control and evaluate the results of the implemented EE measures and policies.

A crucial point for the success of the project was the active support that the project was providing public administration and politicians to introduce and carry through the EMS activities. **Public visibility and acknowledgment** of such efforts, as well as press coverage, are the most important tools to improve the interest of the involved parties.

Concentrated, **tailor-made and dedicated support** over a sufficient period of time is a pre-requisite for the creation of effective implementing capacities for EE policies on the round in cities which must be the promoters and carriers of action and awareness and behaviour change related to energy efficiency.

The **time** required to achieve the self-sustainability of EE teams in cities and counties so that they could continue operating without outside support was at least 2-3 years.

The **right timing** of project instruments: Energy audits should not start before the beneficiary has established an organisational structure with developed capacity (an EE team) to handle energy audit reports and turn them into bankable projects that would be ultimately implemented, and before the beneficiary has secured at least initial funds for the follow-up to the energy audit. An earlier start of EMIS development, developing a Register of Buildings database and collecting data on consumption, introducing Green Office and Green Procurement practice would be much more beneficial.

Project **interventions should be properly sequenced** based on the development of capacity among the project counterparts and staff:

- Obtaining the political commitment of local authorities(Energy Charter)
- Institutional and organisational capacity development (Letter of Intent):
- Establishing energy management responsibilities
- Initiating training
- Preparing a building stock register
- Starting to monitor energy use, establishing baseline consumption, setting targets (installing an EMIS and providing training)
- Cities and counties securing their own budget for EE activities (a condition for continued project support
- Mobilising qualified service providers (establishment of EE corners).”

“The **sustainability of results** requires building ownership by local and national authorities. Provisions for local ownership and sustainability must be factored in from the very beginning. Local ownership and sustainability was achieved by:

- Securing firm political and financial commitments before starting technical activities. All mayors and prefects (147) signed the Croatian Energy Charter within 8 months. This was followed by a requirement to declare and approve their own energy and environmental policy, and then by a letter of intent where the cities gave firm commitments to setting up their own energy management teams. Only when these terms were in place did UNDP-GEF start to engage in supporting them in the introduction of energy management, and in other technical activities;
- Mutual commitments: The project entered into partnership and provided technical and other assistance only to those local and regional governments that officially committed to appoint a responsible person and include the new EE office in their organisational structure;
- Professional development: Personnel working in the EE offices were continuously trained to ensure they gained basic knowledge and skills necessary for the independent performance of their duties in the future. This training was performed on-the-job and in workshops, and the growing number of cities involved caused increased requirements for the project team in terms of size, composition and competence;
- Tools and technical assistance: An IT tool, the Energy Management Information System (EMIS), was developed and provided free of charge to help local authorities to continuously collect, store and analyse all data related to energy consumption and the performance of buildings in their jurisdiction. Personnel in EE offices were trained in the use of EMIS, and technical help was provided to collect all initial data on buildings;

The implementation of strategic projects is a complex process with many stakeholders. One of the issues that should be considered is the timeframe that is needed to assure sustainability at the national level. Our experience tells us that this is at least 5-6 years, assuming a quick start-up;

The project results cannot be scaled up if interventions rely on donors’ resources only. Indigenous financing is required for successful scaling up.”

Some of the identified key **challenges of managing the implementing team and relationships with the country office (CO)** operations included the following:

- ***Changing the mind-set for team members from event to process***, and from individual project intervention to the systemic change that we aimed at achieving;
- Maintaining ***clarity and consistency*** about what the project does for the partners and what the partners are required to do themselves;
- Maintaining an ***entrepreneurial and innovative development and learning*** approach. For instance, the Sisak pilot project evolved from the first city to introduce an EMS, to the first city to develop a “Smart Energy City” strategy. Since both concepts were a novelty at the time and place, the city was learning during the process together with our project team members. This was a good example of transformational change with incremental improvements, while understanding long-term trends and opportunities;
- ***Keeping the work focused*** – with dozens of parallel events going on all the time, it was important to maintain a sense of strategic direction and not to be sidelined by specific activities, thus losing focus on what the project ultimately aimed to achieve;
- ***Creating a knowledge culture*** – it is important for a project of this size to document what it is doing and how this is to be done by the project team members. It was necessary therefore to encourage the writing of papers, guidebooks, manuals and other materials, even though it took precious time from the implementing activities;
- ***Being comfortable with ambiguity and uncertainties***. Working on a complex project on a national scale means working with uncertainties, lack of clarity, multiple stakeholders with sometimes conflicting goals, and in an ever-changing environment. Ambiguity and uncertainties arise from the entrepreneurial quality of thinking globally, an acting-locally approach, and due to the diversity of stakeholders, the absence of “off-the-shelf”

solutions, different perspectives and an emerging context. In such situations, the role of CO and its willingness to take risks, to support high-level negotiations and to bridge financial gaps is important;

- **Launching project implementation and securing the right tools.** We needed to figure out what we wanted to do and to let that drive project implementation through an “emerging environment”. An energy management system (EMS) was selected as the implementing platform around which all other project activities revolved. For that, we needed to develop an initial centralised supporting IT infrastructure – the energy management information system (EMIS), then to pilot a core physical technology solution in the City of Sisak, and continue to update and improve it. We also needed to develop our team capacity for supporting beneficiaries to implement the EMIS;
- **Developing project team organisation and structure** to implement the project strategy. This required defining the core functions, activities and extent of the support to be provided to the beneficiaries. Not the least important was the issue of how to organise ourselves to manage legitimacy, accountability, transparency, and value with a project on a national scale where few people were able to continuously comprehend what the project was doing over its growth, both internally within our CO and externally;
- **Difficulties in planning on mid/longer-term basis** (6-12 month horizon) in ever-changing circumstances and uncertainties - reflected in peak workloads in procurement and CO backstopping (bottlenecks and delays as result of insufficient planning);
- Facing standard issues like observance of deadlines, lack of follow-up, poor quality of outputs etc.
- **Building team capacity** to implement the project strategy. This required defining the core knowledge and skills required and then building team competences on the job. Investing time, effort and money into team building activities is the key to teamwork performance;
- A serious **impeding factor** for the **motivation of the project team** was the nature of the contracts – mostly SSA. This creates difficulties in implementation as the people under such contract modality lacked sufficient motivation and job security;
- Further, there were difficulties encountered in the project interaction with the UNDP Operations unit, and misunderstandings of the perceptions about its function, being either operational compliance unit or provision of “Services” unit (such as IT, procurement, communications, etc.);
- **Perseverance** – this was in big demand!”

For **organisational learning**, the report noted, among others, the following:

- “It is important to note that there is limited support within the UNDP system for the development of **implementing skills**. The project management courses and the “PRINCE” are not sufficiently developing skills but rather are forcing learning a glossary by heart.”;
- **“Building the capacity of “capacity builders”**, providing them with relevant tools and training, and building their competences and skills, are challenges that UNDP as an organisation has yet to address. People working on projects need supreme technical knowledge and analytical and organisational skills in order to achieve results that are measurable and have the desired impacts and sustainability. Project budget should be allowed (donor should allow) to plan for this expenditure. Or projects should have access to CO learning opportunities, which should be high enough for all staff, including projects.”;
- “Knowledge management is also a process that needs time, UNDP works on improving this corporately and is in constant process of providing tools for practitioners (community of practice, team-work space).”
- “People who are implementing projects are the most valuable UNDP resource for **delivering results and building credibility**. This should be reflected in the modality of their contracts, as well as in corporative practices to further develop and retain their knowledge and skills, and improve their motivation, sense of belonging and, consequently, their productivity.”
- **“Organisational learning and knowledge management**. Important capacity for delivering development results lies in projects. UNDP has to develop in modalities of operation that do not create unnecessary tensions between

projects and central units (COs). This means that we have to recognize that running a project requires a in a combination of skills from a project team and CO team which has assurance and supporting role for operations, communications, high-level negotiations. CO (programme) integrates projects into a bigger picture and facilitate synergies between different projects to enhance impacts in certain regions or sectors within the country.”

“The **closing phase** should be a bridge to sustainability. **The key factor is to secure institutional and human capacities and competences for the continuation of activities.** At the local level (cities and counties), there are a number of energy management offices, EE info-centres and EE corners that are continuing to work independently. The project has also worked with local and regional energy agencies and was continuously supporting them and strengthening their capacities and competences for energy management, and they now act as important support for cities and counties.

At the national level, the project had proposed the creation of a national Energy Efficiency Agency, to which relevant ministries did not agree. Instead, responsibilities for implementing EE policies were split between the Ministry of Economy and the Fund for Energy Efficiency and Environmental Protection. This was not a good solution, and it could be seen that after 2 years of this arrangement, it was not functioning.

There are a number of other challenges that need to be addressed after the project closure, which would be difficult to achieve without a single dedicated institution in place:

- Continuing to increase competences;
- Continuing to develop a full national scale of EE activities while maintaining quality;
- Avoiding bureaucratisation and turning to formalities;
- Remaining decentralised, efficient and accountable;
- Securing continuous financing;
- Continuously engaging local administrations and the national government;
- Maintaining accountability, reputation, legitimacy.

However, the project activities are still continuing for two more years under exclusively local financing. Hence, there is still time to strengthen the sustainability of the project results.”

Annex 8.7 Capacity Assessment

Results of capacity assessments of Implementing Partner (including HACT Micro Assessment) - forming Ministry of Energy, Development and Environmental Protection of the Republic of Serbia.

UNDP Serbia conducted HACT Macro and Micro Assessment for all UNDP Implementing Partners in the Republic of Serbia. Macro-Assessment was conducted in 2010 by an independent authority indicating the lack of the capacity and resources of the Supreme Audit Institution as well as the immanent risk related to the cash management, budget reporting and internal audit function of public sector in the Republic of Serbia. In November 2011 UNDP Serbia also conducted Micro-Assessment of all key Implementing Partners of UNDP Serbia, including the Ministry of Environment, Mining and Spatial Planning.

Assessment was conducted by the independent Audit Company “Baker Tilly, Ltd” procured through UNDP procurement. The key audit areas with medium risk finding were “Staffing, Internal Audit and Reporting and Monitoring”. All other risk areas were defined as “low” as follows: Implementing Partner, Funds Flow, Accounting Policies and Procedures, External Audit, Information Systems. The overall report indicated low risk status of the Ministry of Environment, Mining and Spatial Planning.

After the elections in the Republic of Serbia in July 2012, i.e. since 26 July 2012, the Ministry has been merged (Energy and Environment) forming Ministry of Energy, Development and Environmental Protection of the Republic of Serbia. The part dealing with environmental protection has had a long-lasting cooperation in the implementation of GEF projects in cooperation with UNDP. The part dealing with energy has previous experience in cooperation with UNECE, thus, the newly formed Ministry has had cooperation with United Nations Organizations which made a solid ground for continuation of the cooperation in developing new proposals.

Due to the fact that the new Ministry was established, in line with UNDP requirements, separate 2013 Micro-Assessment was performed by UNDP Country Office with the new Ministry, in line with UNDP POPP, Project Implementation, Project Definition/Initiation requirements, Prince2 based methodology. Assessment was conducted by UNDP Serbia Prog/Finance and Ministry’s Head of Finance Unit. In the meantime, UNDP Serbia will continue engaging external private audit firms to conduct annual audits for NIM/NGO projects until further notice. Since 2003 (year of initial NIM project implementation) UNDP Serbia has had annual external audits every year. All reports have been unqualified with no high audit risks. Every year UNDP Serbia conducts review and recommendation on all audit findings for all projects in Country Office.

Moreover, UNDP has contacted Republic of Serbia Supreme Audit Institution and inquired about the possibility to include UNDP projects into regular SAI annual audits but no positive response was received from SAI due to the lack of staff and no possibility to commit to additional work to be performed by the Institution that started audit exercises in 2007 only. Full Micro-Assessment is attached to the project proposal. Key audit areas defined were: Staffing, Internal Audit and External Audit. UNDP is of the opinion that the Ministry is to be appointed as fully-fledged Implementing Partner to this project

Special Clauses. *In case of government cost-sharing through the project which is not within the CPAP, the following 10 clauses should be included:*

1. The schedule of payments and UNDP bank account details.
2. The value of the payment, if made in a currency other than United States dollars, shall be determined by applying the United Nations operational rate of exchange in effect on the date of payment. Should there be a change in the United Nations operational rate of exchange prior to the full utilization by the UNDP of the payment, the value of the balance of funds still held at that time will be adjusted accordingly. If, in such a case, a loss in the value of the balance of funds is recorded, UNDP shall

inform the Government with a view to determining whether any further financing could be provided by the Government. Should such further financing not be available, the assistance to be provided to the project may be reduced, suspended or terminated by UNDP.

3. The above schedule of payments takes into account the requirement that the payments shall be made in advance of the implementation of planned activities. It may be amended to be consistent with the progress of project delivery.
4. UNDP shall receive and administer the payment in accordance with the regulations, rules and directives of UNDP.
5. All financial accounts and statements shall be expressed in United States dollars.
6. If unforeseen increases in expenditures or commitments are expected or realized (whether owing to inflationary factors, fluctuation in exchange rates or unforeseen contingencies), UNDP shall submit to the government on a timely basis a supplementary estimate showing the further financing that will be necessary. The Government shall use its best endeavours to obtain the additional funds required.
7. If the payments referred above are not received in accordance with the payment schedule, or if the additional financing required in accordance with paragraph above is not forthcoming from the Government or other sources, the assistance to be provided to the project under this Agreement may be reduced, suspended or terminated by UNDP.
8. Any interest income attributable to the contribution shall be credited to UNDP Account and shall be utilized in accordance with established UNDP procedures. In accordance with the decisions and directives of UNDP's Executive Board, the contribution shall be charged:
 - (a) 10% cost recovery for the provision of general management support (GMS) by UNDP headquarters and country offices
 - (b) Direct cost for implementation support services (ISS) provided by UNDP and/or an executing entity/implementing partner.
9. Ownership of equipment, supplies and other properties financed from the contribution shall vest in UNDP. Matters relating to the transfer of ownership by UNDP shall be determined in accordance with the relevant policies and procedures of UNDP.
10. The contribution shall be subject exclusively to the internal and external auditing procedures provided for in the financial regulations, rules and directives of UNDP.

Annex 8.8 UNDP Environmental and Social Screening Report (REFER TO SEPARATE FILE)

Annex 8.9 Tracking Tool for Climate Change Mitigation Projects (REFER TO SEPARATE FILE)

**Annex 8.10 Standard Letter of Agreement between UNDP and the Ministry Mining and Energy
for the Provision of Support Services**

UNDP COUNTRY OFFICE SERBIA PRICE LIST FOR COUNTRY OFFICE SERVICES TO PROGRAMME

(valid as of January 1, 2015)

Sub-process	Process Components	Rate
		USD
Project Justification and Definition (Pipeline Management and Project Development)	Field visits for new project developments (e.g Govt CS)	249.60
	Project proposal formulation (in the capacity of the project developer - research, consulting, desk review, data gathering, budgeting)	748.80
	Project proposal formulation - actual writing, editing, aligning with UNDP procedures	1,497.60
	Project document Addendum formulation and endorsement	31.20
	Assessment of the Implementing Partner	124.80
	Pre-LPAC and LPAC administration (mtg minutes, incorporate comments, obtaining signatures)	124.80
Project Initiation (Management Arrangement Definition and Project Registration)	Management arrangements administration (NPD, LOA), support document formulation and clearance	93.60
	Legal Arrangements administration (CSA, PCA)	93.60
	Project Initiation in Atlas (project data& activities set up &approval) w/o initial budget revision	124.80
	Project Registration with Tax Department	15.60
Project Running (Finance)	Regular internal reporting / updates (budget vs expense with details + plan)	62.40
	Special purpose reporting (internal, corporate)	62.40
	Regular quarterly delivery reviews	93.60
	Regular NIM Report preparation in consultation with partners when not covered by projects	93.60
	Regular NIM Report review	31.20
	Regular Atlas data review and cleaning (monthly)	31.20
	UNDP Year-End data review and cleaning (yearly) - deficits and accounting adjustments	31.20
	NIM audit exercise (communication, pre-audit, draft audit report review, guidance to auditors and partners)	748.80
	GMS collection for off the top method	62.40
	Request for payments preparation (based on documentation) when not covered by projects	6.24
	Budget revision proposals	124.80
	Budget revision (recording and review)	31.20
Project Running (Management and Support)	AWP preparation (drafting, consultations, budgeting , obtaining signature) if not covered by projects	249.60
	AWP review and endorsement	62.40
	Grant arrangement and grant agreement preparation when not covered by projects	62.40

	Grant agreement review , approval and administration	31.20
	Grant monitoring -results and substantive reports review if not covered by projects	62.40
	Grant monitoring -financial reports review	31.20
	Donor Report preparation when not covered by project	1,497.60
	Donor Report review	312.00
	Preparation for the Steering Committee (consolidation of the report plus comm/visibility preparation)	62.40
	Visit to National counterpart institution for oversight and backstopping	62.40
	Field visit with the donor/public/media event	93.60
	Regular VAT Tax Exemption Processing with Tax Office	6.24
	Updates of project data registered with Tax Department	15.60
Training and Coaching	Staff -General Induction training	124.80
	Staff hands on training prg/mngt on induction	1,872.00
	Staff management annually/per staff	1,497.60
	Staff -Atlas Hands on training (per module)	156.00
	Ad Hoc support (troubleshooting Atlas)	31.20
	NIM training for IP- Tax exemption	31.20
	NIM training for IP- Request for Payment /FR	31.20
	NIM training for IP- Legal and Oper Framework	124.80
Communication	Event Scenarios when not covered by projects	62.40
	Event scenarios review	15.60
	Organization of media events when not covered by projects	62.40
Revenue Management	Contribution management in DMS	62.40
	Contribution management in Atlas	62.40
	ASL/ALT ledger set up & monitoring	31.20
	Budget monitoring, revenue management monitoring, allocations monitoring, support to report preparation, communication with MPTF for PassThrough	62.40
Joint Programmes Support and assurance	Field Visits (validation/review missions)	249.60
	Quality Control - evaluation (communication, pre-evalutaion, TOR, debriefing, review, submission for endorsement)	156.00
	Quality control of deliverables	156.00
	Quality Control - final review of TOR	31.20
Project Closing	Closing a project (operationally and financially with handover of files) flat rate	288.46
Procurement Support	Evaluation of Offers (simple procurement)	123.78
	Evaluation of Offers (complex procurement)	187.54
	Evaluation by committee (50%)	93.77
	Coordination by Procurement unit (50%)	93.77
	Contract Administration (including inspection and receiving)	108.17

	Contracting (including negotiations)	70.87
	Preparation of offer and communication with contractor (70%)	49.61
	Contract issuance and clearance (30%)	21.26
	Raising of a Requisition and Approval	22.42
	Raising E-requisition (80%)	17.94
	Approval (20%)	4.48
	CAP/ACP Process	242.45
	Coordination of process by Procurement unit (30%)	72.74
	CAP review by Committee members (40%)	96.98
	CAP meeting (30%)	72.74
	Advertising (not including disbursement)	10.41
	Obtaining reference number and preparing advert for newspapers (40%)	4.16
	Sending of advert and posting on jobs admin site (60%)	6.25
	Enter and Approve PO	19.82
	Entering PO (50%)	9.91
	Approving PO (25%)	4.96
	Dispatching PO (25%)	4.96
	Asset - Create Asset / Modify Asset -per asset (creation of asset in the system)	7.81
	Asset - Modify Transfer / Retire (per asset)	19.82
	Receiving and processing of request (80%)	15.86
	Approval (20%)	3.96
	Asset - Certify / Inventory (per asset)	15.61
	Checking inventory (70%)	10.93
	Certifying inventory (30%)	4.68
	Disposal of equipment (Through sale)	254.52
Human Resources Support	Advertising (not including disbursement)	111.76
	obtaining reference no. on Intranet (10%)	11.18
	preparing advert for newspapers (30%)	33.53
	sending of PDF advert to newspapers (30%)	33.53
	post to jobsadmin site (30%)	33.53
	Preparation of TOR	60.09
	review of TOR (25%)	15.02
	comments (10%)	6.01
	signing off (5%)	3.00
	Programme Officer prepares TOR (45%)	27.04
	Clearance(15%)	9.01
	Short listing	223.52
	pre-screening (50%)	111.76
	performing short listing (50%)	111.76

	Interviewing (full process)	223.52
	HR coordination / Panel (70%)	156.46
	contract issuance/extension (20%)	44.70
	contract approval (10%)	22.35
	SC Performance Evaluation	39.64
	HR follow-up (PB + calc) (70%)	27.75
	Senior Management approval (30%)	11.89
	Vendor Setup (full process)	18.11
	Obtaining vendor data (40%)	7.24
	enter in ATLAS (40%)	7.24
	approval (20%)	3.62
	Recurrent personnel management services: Staff Payroll & Banking Administration & Management (annual fee per staff, per calendar year)	418.89
	Payroll validation, disbursement (35%)	146.61
	Performance evaluation (30%)	125.67
	Extension, promotion, entitlements (30%)	125.67
	Programme Officer prepares TOR (45%)	188.50
	NB clears (15%)	62.83
	Staff HR & Benefits Administration & Management (one time fee, per staff at: - the issuance of a contract, and - again at separation)	186.86
	Recurrent personnel management services: Staff Payroll & Banking Administration & Management (annual fee per staff, per calendar year)	418.89
	Payroll validation, disbursement (35%)	146.61
	Performance evaluation (30%)	125.67
	Extension, promotion, entitlements (30%)	125.67
	Leave monitoring (5%)	20.94
	Consultant recruitment	217.25
	Advertising (20%)	43.45
	Short-listing & selection (40%)	86.90
	Contract issuance (40%)	86.90
	Interns management	65.06
	Issue/Renew IDs (UN LP, UN ID, etc.)	34.36
Finance Support	Payment Process (enter voucher, paycycle, e-banking, approval)	33.55
	Enter voucher (25%)	8.39
	Paycycle, e-banking, approval (75%)	25.16
	AR Management Process (create/apply receivable pending item)	32.17
	Issue /Apply Deposit only	19.57
Administrative Support	VAT exemption process (per request)	7.81
	Obtaining of proforma invoice and preparation of VAT form (80%)	6.25

	Signatory (20%)	1.56
	Travel Management - Ticket	61.27
	Processing of e-requisition (20%)	12.25
	Reservation, PO processing and follow-up (80%)	49.02
	Travel Management - Itinerary/DSA calc (including TE, private vehicle use etc.)	45.66
	Processing of e-requisition (20%)	9.13
	Calculation, PO processing and follow-up (80%)	36.53
	Travel Management - Hotel reservation	18.21
	Coordinating and obtaining reservation (50%)	9.11
	Receiving confirmation and sending to traveler (50%)	9.11
	F10 settlement (not including disbursement)	28.60
	Calculation of entitlements and preparation of F10 (80%)	22.88
	Approval (20%)	5.72
	Travel Management - Visa	38.03
	Preparation of NV (50%)	19.02
	Signatory (10%)	3.80
	Communication with embassy, sending of copies and follow-up (40%)	15.21
	General Logistics Support to organization of events	102.09
	Receiving of offers, coordination with project team and follow-up (30%)	30.63
	Processing of e-requisition (20%)	20.42
	Processing of PO (50%)	51.05
	Logistics Support to events (Logistics staff time only)	35.88
	Transfer Support to in-country events (driver & vehicle fee)	31.22
	ICT Support to events (ICT staff time only)	35.88
	Finance Support to events (Finance staff time only)	35.88
	Vehicle registration	15.61
	Shipment arrangements	28.62
	Custom clearance	43.24
	Preparation of form (35%)	15.13
	Signatory (15%)	6.49
	Sending to protocol and forwarding (50%)	21.62
ICT Support	Reset lost or forgotten password	7.81
	Opening of Email Account	7.81
	Closing of Email Account	7.81
	Suspending of Email Account	7.81

	Opening of Domain Account	7.81
	Closing of Domain Account	7.81
	Installation of new computer	71.76
	Reinstallation of old computer with new software	71.76
	Backup of data	35.88
	Cleaning the computers from viruses	35.88
	Creating ICT specifications	35.88
	Ad-hoc services of ICT staff charged per hour:	
	Web site development	35.88
	Database development	35.88
	ICT analysis of web applications	35.88
	ICT analysis of software packages	35.88
	Network administration for project location	35.88
	Creating SharePoint sites and pages	35.88

The total amount for provided support services will not exceed \$15,000.

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UNDAF Outcome(s): Outcome 2: Sustainable Development and Social Inclusion Enhanced

Expected CP Outcome(s): 2.5 - Improved mechanisms to protect the environment, ensure sustainable management of natural resources, and mitigate and/or adapt to the impacts of global climate change on social, economic, and ecologic systems

Expected CPAP Output(s): 2.5.4.3: Improved energy sector performance through enhanced market mechanisms, renewables and demand-side initiatives

Executing Entity / Implementing Partner: Ministry of Mining and Energy

Implementing Entity/Responsible Partners: UNDP

Country: Republic of Serbia

Programme Period:	<u>2015-2020</u>
Atlas Award ID:	<u>00087720</u>
Project ID:	<u>00094643</u>
PIMS #	<u>4588</u>
Start date:	<u>Sep 1, 2015</u>
End Date	<u>Aug 31, 2020</u>
Management Arrangements	<u>NIM</u>
PAC Meeting Date	<u>July 16, 2015</u>

Total resources required:	<u>US\$ 21,900,000</u>
Total allocated resources:	<u>US\$ 21,900,000</u>
Regular UNDP (TRAC):	<u>US\$ 200,000</u>
Other:	
GEF	<u>US\$ 2,300,000</u>
Other Cash	<u>US\$ 17,200,000</u>
In-kind	<u>US\$ 2,200,000</u>

Agreed on behalf of Government of Republic of Serbia

Aleksandar Antić
Minister of Mining and Energy



SIGNATURE

21/10/15
Date/Month/Year

Agreed by UNDP:

Irena Vojáčková Sollorano
Resident representative



SIGNATURE

13/10/15
Date/Month/Year