PROJECT

PRO-ENERGY

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Activity Leader:	**National Agency of Natural Resources**
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DISCLAIMER:

The common challenge of PRO-ENERGY is to improve energy efficiency of public buildings (municipal/provincial/regional buildings, schools, universities, health centers, hospitals, museums, sports facilities etc.). This is a common problem faced by the territories participating in the project characterized by old facilities, outdated/degraded building façades, materials & equipment (insulation, electrical appliances, cooling/heating systems etc.), low energy consciousness & awareness, lack of skilled civil servants, etc. leading to high-energy consumption & CO2 emissions.

IDENTIFICATION SHEET

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INTRODUCTION

The common challenge of PRO-ENERGY is to improve energy efficiency of public buildings (municipal/provincial/regional buildings, schools, universities, health centres, hospitals, museums, sports facilities etc.). This is a common problem faced by the territories participating in the project characterized by old facilities, outdated/degradated building façades, materials & equipment (insulation, electrical appliances, cooling/heating systems etc.), low energy consciousness & awareness, lack of skilled civil servants, etc. all leading to high energy consumption & CO2 emissions. Combined with the fact that participating territories are energy import dependent it is more than evident that there is room for improvements in energy consumption & more efficient use of energy. More importantly, the exemplary role of the public sector should be promoted by increasing energy savings in public buildings. PRO-ENERGY aims to address these issues by developing & implementing a Joint Strategy & Action Plan, increasing competences of buildings' owners & operators, developing& applying technologies& tools to reduce energy consumption in public buildings,& promoting generated good practices& results to local/regional/national entities in the Balkan-Med region. The project addresses the policy & institutional level (Joint Strategy& Action Plan),human resources level (Capacity Building of Energy Managers)& the managerial systems level (ICT Platform & CBA Modeller & Energy Performance Contracting-EPC). The novel energy saving technologies promoted by PRO-ENERGY refer to Behaviour-based Energy Efficiency. Behavioural efficiency programs introduce cost-effective ways to reduce energy consumption, as literature & practice suggests. The overall objective is to promote Energy Efficiency in public buildings in the Balkan Med area & to create a practical framework of modelling & implementing energy investment interventions through specific ICT monitoring & control systems,& through EPC. The innovativeness of PRO-ENERGY lies on the EPC use, a proven in EU projects, practical& effective "creative financing" tool enabling funding of energy upgrades& on the fact that most energy efficiency measures involve technological interventions but equally have to rely on people adjusting their energy consumption behaviour. To do so, consumers should be provided with meaningful, clearly communicated&continual feedback. PRO-ENERGY focuses on non-domestic consumers (employees/visitors etc. of public buildings), because in this segment initiatives are normally delivered at the organisational level & there is no direct link to personal wealth of the individual users. Motivation for those users to engage in energy efficiency behaviours is therefore very different from domestic users& must rely on corporate & social responsibility objectives & societal norms' reinforcement. Behaviour change measures at work may inspire consumers to act differently at home increasing thus multiplier effects.

Based on the above, Work Package 3 (WP 3) "Joint Regional Analysis, Strategy and Framework" aims at sustainability of project results is also self-evident since PRO-ENERGY involves activities that directly impact & reduce energy consumption in public buildings leading to the coverage of an apparent need of project partners & stakeholders to keep applying & trying to extend the applicability of these activities.

More specifically, Activity WP3 Del. 4.6.3 "Existing situation analysis - energy efficiency**." aims to:**

1. Joint Strategy & Action Plan contributing to developing effective energy efficiency policies & measures & to defining pilot actions for the reduction of energy spending in public buildings.
2. Joint Cost-Benefit Analysis Modeller (open to all) supporting decision-making for retrofits, renovations etc. which lead to increased energy efficiency.
3. Energy Performance Contracts through open-tendering procedures to finance energy upgrades from cost reductions & contribute in this way to increased energy savings & increased energy efficiency.
4. Framework for energy-related interventions in public buildings which includes the implementation of Energy Audits in selected public buildings enabling through smart sensor systems the recording of energy consumption & the measurement of the impact of behavioural change measures.

List of abbreviations

AKBN - National Agency of Natural Resources
AKE - National Agency of Energy
DCM - Decision of Council of Ministers
EBRD - European Bank for Reconstruction and Development
EE - Energy efficiency
EEC - Albania - EU Energy Efficiency Centre
ERE - Energy Regulatory Authority
EUROSTAT - European Statistics Office
GTZ - German Technical Cooperation
IEA - International Energy Agency
IFC - International Finance Corporation
INSTAT - Albanian Institute of Statistics
KESH - Albanian Power Corporation
KfW - Kreditanstalt fuer Wideraufbau
LPG - Liquefied Petroleum Gas
METE - Ministry of Economy, Trade and Energy
MEI - Ministry of Energy and Industry
MoEFWA - Ministry of Environment, Forestry and Water Administration
MPW - Ministry of Public Works
MoT - Ministry of Transport
NEEAP - National Energy Efficiency Action Plan
NSE - National Strategy of Energy
OSSH - Distribution System Operator
OST - Transmission System Operator
RES - Renewable Energy Sources
USAID - U.S. International Development Agency
WB - World Bank
toe - Tons oil equivalent
ktoe - Kilo tons oil equivalent
GWh - Gigawatt hours
MWh - Megawatt hours
MW - Megawatt
kWh - kilo watt hours
kW - kilo watt
UNECE - United Nations Economic Commission for Europe

1 Contents

1: INTRODUCTION

The main objective of the PRO-ENERGY project is the incorporation of open-source Joint ICT Platform guiding energy consumers behaviour to energy saving actions contributing to the achievement of 20% reduced energy spending in public buildings & to increased energy efficiency.•1 Joint Strategy & Action Plan contributing to developing effective energy efficiency policies & measures & to defining pilot actions for the reduction of energy spending in public buildings.•1 Joint Cost-Benefit Analysis Modeller (open to all) supporting decision-making for retrofits, renovations etc. which lead to increased energy efficiency.•3 Energy Performance Contracts through open-tendering procedures to finance energy upgrades from cost reductions & contribute in this way to increased energy savings & increased energy efficiency.

For this purpose attraction points (acting as nodes of the path) will be created through demonstrative application of environmental friendly technologies. Specific targets include:

- Demonstrative implementation of mature and targeted projects,
- Improvement of tourism infrastructure which leads to growth, new jobs creation and the development of new innovative markets,
- Multidimensional contribution to the European and national targets of Greece and Albania (2020) as well as the preparation of strategic intra-Municipalityal development plans for green tourism in view of the new programme period (2014 – 2020),
- Investigation of mature ready to implement projects of green tourism,
- Attraction of private sector investments in the field of tourism.

The Specific objective of the project is to promote sustainable energy, through an integrated approach to the efficient use of energy and its production from renewable sources.

The eligible territories of Balkan MED" present high potential for the implementation of energy and environment-friendly technologies in open spaces, facilities and buildings of architectural heritage characterized by high touristic traffic, a fact that can lead to greater and faster touristic growth. The potential for Energy Efficiency, especially for open spaces, buildings and facilities, is considerable particularly because of the related high energy consumption and CO_2 emissions. Moreover, tourism is one of the main pillars of development of the eligible areas and its strengthening is a strategic choice for both Greece and Albania towards 2020.

All activities will be undertaken with a strong participatory approach and this plan will be executed in three main phases focus on:

a– Target Communities identification

On the base of an agreed set of common criteria, we will select one or more target communities in which a comprehensive energy sustainability planning process will be subsequently implemented. For each of these target communities, the direct involvement of the local boards in the project activities and the formal commitment of the competent public authorities to adhere to PRO-ENERGY objectives and actively support its activities will be requested (e.g. municipal or Municipality/county government).

b – Capacity building for target communities
Activities for territorial promotion, information and training specifically addressing the chosen target communities and aiming to supply citizens and local businesses with assistance in a) developing skills and competencies in the energy sector; b) reinforcing institutional and administrative ability, specifically relating to the programming and management of European and national energy funds; c) constructing organizational structures able to guarantee efficient management systems and the participation of the relevant parties in the sphere of sustainable energy.
The targets of this task are the local communities identified in the preceding point a; however, depending on the specific administrative, political and socio-economic situations of each pilot areas.

c – Energy assessment of Target Communities
Assessment of the total energy balance including all domestic, productive, construction and economic sectors, and the specification of possible strategies for the fulfilment of medium-long-term requirements for energy-saving activities and the use of renewable energy. The studies will address both energy needs and consumption models and the local availability of energy resources and/or energy efficiency improvement potential.

d. "Integrated Plans for Energy Sustainability" represents the 'heart' of the project and focuses on the development, in three Demonstrative Zones selected, of a complex programming and planning operation of which the final results are "Integrated Energy Sustainability Plans". These plans will define for each target community the strategy of choice for a transition towards a more sustainable use/production of energy and will identify an integrated set of actions to be implemented over time.

The Sustainability Plans will be defined through an articulated and gradual process which aims to actively involve the local stakeholders and the citizens in the decisional process. In order these Demonstrative Zones to be significant and the results produced easily transferable/adaptable to different situations, the selection of the target communities in which to implement the "Integrated Energy Sustainability Plans" will be made according to a shared set of criteria that take into account all the relevant technological, geographical and socio-economic factors, thus maximizing their replicability and diffusion potential.

Based on the above mentioned analysis the final conclusion is: the maximum final RES Target for Albania shall be at 37.96% rounded to 38%. This percentage will serve as the National RES Target for the year 2020. Also, it is important to be mentioned that all future calculations for fulfilment of the RES Target are based the value of 38%.

Gjirokastra is a town and a municipality in southern Albania. Lying in the historical region of Epirus, it is the capital of Gjirokastër County. Its old town is a World Heritage Site described as "a rare example of a well-preserved Ottoman town, built by farmers of large estate." Gjirokastër is situated in a valley between the Gjerë mountains and the Drino, at 300 metres above sea level. The city is overlooked by Gjirokastër Fortress, where the Gjirokastër National Folklore Festival is held every five years. Gjirokastër is the birthplace of former Albanian communist

leader Enver Hoxha and notable writer Ismail Kadare. It hosts the Eqrem Çabej University. Gjirokastra.

Figure 1: Map of Albania and position of GjirokastraGjirokastra District

The south east borders mainly of Gjirokastra and Gjirokastrai district are political borders with Greece, whereas all the other border is an administrative one and it goes in the west and southwest with the district of Saranda and Delvina, in the northwest with that of Ballshi, in the North with Gjirokastra and in the northeast and east with the districts of Skrapari and Kolonja. Some of the region consists of the following municipalities and communes:

Gjirokastra District:

Antigone	Zagorie
Cepo	Kurvelesh
Gjirokaster	Qesarat
Lazarat	Frasher
Lunxheri	Petran
Tepelene	Dropull i Siperm
Picar	Dropull i Poshtem
Carcove	Libohove

2. GJIROKASTRA MUNICIPALITY TOURISM SECTOR AND ITS RELATION WITH ENERGY EFFICIENCY IN SERVICE SECTOR

The present municipality was formed at the 2015 local government reform by the merger of the former municipalities of Antigonë, Cepo, Gjirokastër, Lazarat, Lunxhëri, Odrie and Picar, that became municipal units. The seat of the municipality is the town Gjirokastër The total

population is 25,301 (2011 census), in a total area of 469.25 square kilometres (181.18 sq mi).The population of the former municipality at the 2011 census was 19,836. Gjirokastra. Following photos are presenting the main building of the Gjirokastra municipality.

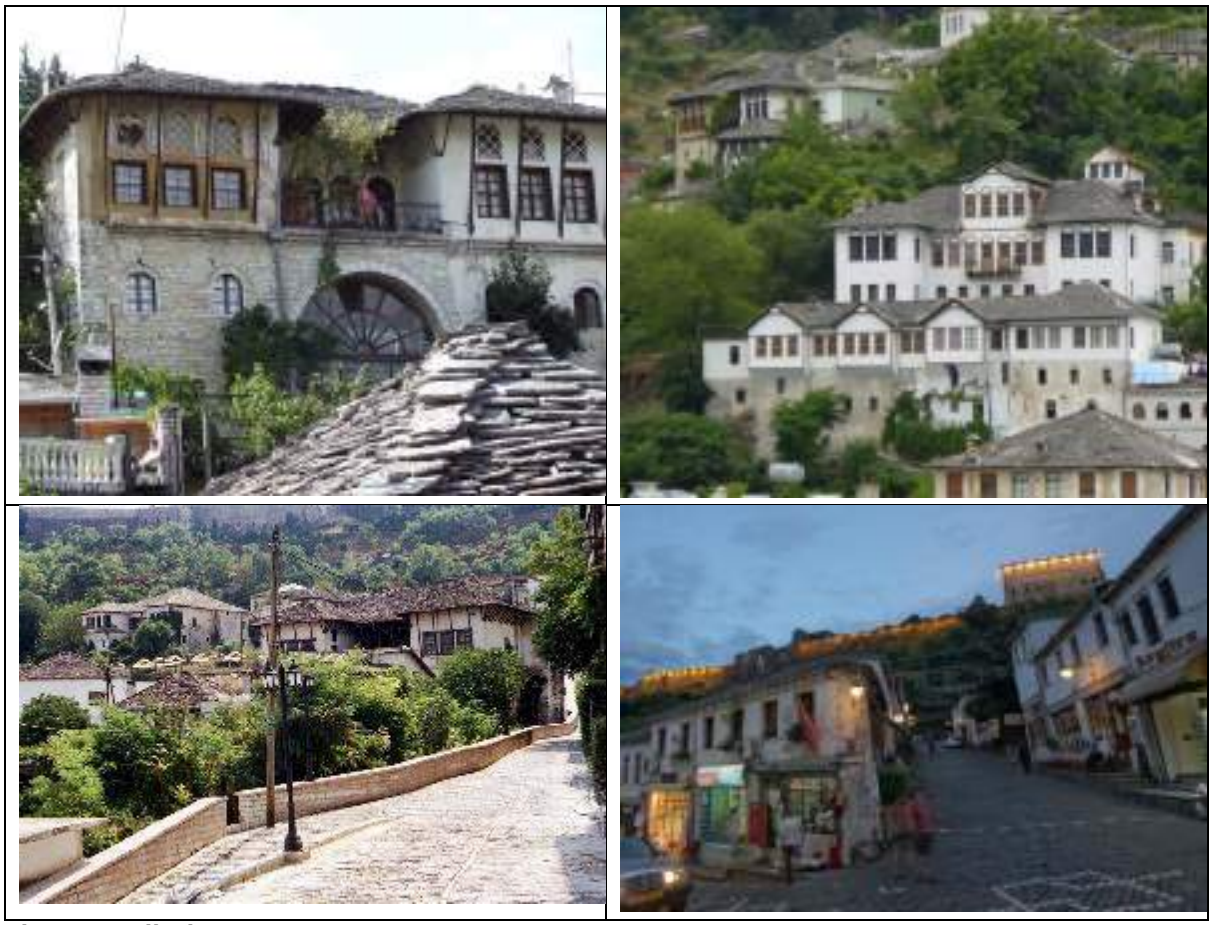


Figure 2: Gjirokastra

The climate is warm and temperate in Gjirokastra. There is more rainfall in the winter than in the summer in Gjirokastra. The climate here is classified as Csa by the Köppen-Geiger system. The temperature here averages 14.3 °C. The average annual rainfall is 1593 mm. Gjirokastra the hottest month is July while January is the coldest. The difference in precipitation between the driest month and the wettest month is 266 mm. During the year, the average temperatures vary by 17.9 °C. Gjirokastra There exists good reserves of SHPPs, Wind Potential as well as Solar Energy. More details about them will be given in the following sections.

The households/public buildings energy sector is one of the most important energy consuming sub sectors in Gjirokastra District. Its importance is highlighted by the fact that it consumes large quantities of electricity and fuel-wood, which has contributed to the country's current severe energy crisis. Up to year 2000, the supply and demand for cooking and heating fuels (mainly wood) was more or less in balance.

After 2000, there was a large reduction of fuel-wood supplied by the forestry enterprises to urban area of this region. As a result there was an over cutting of trees

(much of which is illegal) and overloading the electricity distribution system. Electricity is supplied to the region by a 110 kV transmission line that is far away from the power plants. This thing has brought in a very low level of voltage in electricity supplied, which is down 150 V in household/public buildings sectors. The growing use of electrical appliances, fuel-wood shortages and other related issues, such as access and prices, are worrying and can cause further future problems. Due to lack of coherent data, the uncertainties about the actual level of fuel-wood own harvesting in the rural areas is growing. This uncertainty severely influences any judgments, not only in relation to the level and structure of the households/public buildings energy consumption but also in relation to the level and structure of the total energy supply for this region.

The energy consumption of the household/public buildings sector is divided into four parts describe as much basic energy uses with widely differing characteristics: space heating, water heating, cooking, lighting and electrical appliances. Right now, the population in Gjirokastra Clearly more information is needed in order to determine which actions are appropriate to be taken in order to improve the efficiency, to increase the use of local energy sources from a technical and from an economic point of view, in the use of energy by households/public buildings sectors in Gjirokastra Area. The starting point is that electricity consumption has exploded when the level of non-technical losses really picked-up. But what is behind this development is rather unknown. The building conditions and the trends in the households/public buildings consumption of the energy and water play an important role in estimating the chances of accomplishing these ambitious objectives. The issue of water is mentioned in close connection with the issue of energy because the promotion of local energy sources, such as the use of small-scale heat-only-boilers (which may be used upon a range of different fuels), District Heating Systems and Combined Heat and Power (especially for the consumers which were supplied by CHP) linked with water based central heating systems inevitably is dependent on a reliable and efficient water supply system. But even more important is the fact that due to the prevailing low conditions of the buildings and installations, the associated losses are huge.

For calculating the energy demand in the Service Sector has divided it in two branches: Public Service and Private Service. The Public Service Sector has a traditional experience in the heat demand, having mainly old technology, installations and organization, with some cases of new schemes introduction. The database for the quantity of energy demanded for each service and the contribution of each energy commodity is based on different surveys prepared by National Agency for Energy and World Bank studies. It should be underlined that space heating, domestic hot water and lighting are generally carried out with a very poor quality, due to old energy infrastructure in public service institutions and lack of budget.

Private Service Sector is a new experience aiming at a rapid introduction of modern technology and instalments, but improvements are needed regarding the efficient utilization. Private Service Sector has inherited some traditional repair / service and small shops / restaurants that had neither possibility nor demand for space heating and air conditioning. Meanwhile, in many services, the private sector has experienced modern and qualitative developments. This service group includes business

categories such as hotels, restaurants, banks, tourist agencies, consulting and insurance offices, etc., as well as many parallel services with the public service such as education, culture, health, etc., aiming the maximal comfort. Main attention is paid to the reduction of electricity. Different measures are foreseen to be taken on Gjirokastra District related with improvement of energy supply in general and EE in particular, such as the increase of electricity tariffs, implementation of energetic building code in dwellings, application of fiscal incentives for energy renewable resources and other efficient resources, awareness campaigns, etc. These measures are:

- A strong penetration of diesel no. 2 and solar for space heating;
- A strong penetration of LPG for space heating and cooking;
- An improvement of thermal insulation in existing building stock and rigorous application of the Energetic Building Code for new buildings in service sector;
- An extension of solar panels use for preparation of hot water in public and commercial buildings;
- A gradual introduction of small scale combined heat and power plants (SSCHP diesel) and central heating schemes for large and small consumers (hospitals, boarding-schools, hotels, etc.), particularly through substitution of existing conventional systems;
- An efficiency increase through “second hand” measures, such as increase of fluorescent lighting, use of intelligent electronic techniques, use of modern electric appliances with improved cos Φ for different consumers of the service sector.

Whilst the Gjirokastra Region has a very long history, distinctive traditions and an exceptional environment, tourism in most of the region is emerging as an economic sector. Figures for tourist arrivals have not been collected or compiled but according to local stakeholders, there has been a significant increase of visitors in recent years. The region has an excellent mix of soft and hard cultural assets as well as outstanding natural assets. These are described in greater detail in the following section as are the markets that are currently visiting the Gjirokastra Region. The next few paragraphs provide an impression of the richness of the Gjirokastra Region but do not attempt to present the totality of the tourism products that exist. Gjirokastra has special conditions for tourism since it is a World Heritage site; elected in 2005 for its rare type of Ottoman stone houses which the old bazaar/old town is dominated by. The management of a World Heritage site is both a national and a global concern

involving many stakeholders exhibiting different desires and requests. World heritage management and tourism destination aspirations are only two of many other issues facing the city of Gjirokastra and the nation of Albania. Like many other post-communist countries Albania is struggling between a fast economic development and the restraints of preserving heritage: 4 modernization vs. tradition. In Gjirokastra this is evident through the city's division in a new and old town – each fighting for attention and resources. The region has a wide range of products based on its history, culture and traditions, its villages and its lakes and mountains. These constitute a major tourism asset and are located throughout the region. Several villages are located near Gjirokastra City including Antigone, Cepo, Dropull i Siperm and Dropull i Poshtem. Some of the best alternatives which Gjirokastra offers to tourists are:

Streets: The old main street climbs the hilly terrain towards the old bazaar, where the paved roadways and stepped sidewalks are lined with coffee houses and restaurants.

Gjirokastra Castle: One of the biggest castles in Albania, which represents magnificent and well preserved constructions in the country. Its origins go back to the 4th century AD and it was greatly extended by Ali Pasha in order to protect the growing town. Raises high on the top of a hill, it provides the possibility for visitors to cast a glance on the most interesting landscape of the city and the nearby area and Drinos valley. The Festival of the Folkloric Arts from all parts of Albania use to be organized continually there.

National Museum of Armaments: (housed inside the castle) where various arms from the neolithic period until the Second World War are displayed.

Ethnographic Museum: In the home that was the birthplace of Enver Hoxha. The house has four floors, all of which are open to the public. The rooms are arranged as they would have actually been used and are decorated with numerous household items, folk costumes and cultural artefacts typical of a wealthy Gjirokastra family of merchants or Ottoman administrators living in the 19th Century.

Zekate house: The best surviving example of an Ottoman tower house in Gjirokastra.

Saint Sotire Church

Mosque in the Old Bazaar

Museums: A number of museums exist in Gjirokastra: the ethnographic museum, the Skenduli house and the castle. Our gathered picture of these activities is that there is no clear definition of responsibilities or management (the municipality is in charge on paper). The entrance fee of 200LEK/ visitor (approximately 1,5 Euro) is the guide's salary, there are no other money for running the museums. This lack of funds results in physical degradation, and no promotion, marketing or printed information in Albanian/ English and so forth. When asking the guide at the Skenduli house about the information, he said "Who shall pay for printing this brochure – me?" The deteriorating physical buildings give a sense of abandonment. In the ethnographic museum the hole in the roof is managed by buckets. There is also a communication problem with the guides not speaking English. The museums could otherwise

be a great experience with their interesting and unique interiors and functions, now they are however lost in translation and poor display.

Hotels: There are seven hotels inside the old bazaar of various shapes and prizes. One of them is especially using the traditional patterns and materials as a profile. We stayed one night in another hotel to try out the service level. There was no information about check- out times, breakfast or wife password et.c. and the employee could not speak English which caused confusion regarding many things. According to Denisa Basha (Gjirokastra Tourism Service Office) this is the case at almost all the hotels. She is currently working on hotel evaluation to create “stars” based on quality standards. We interviewed the hotel owner of two hotels to ask questions on sustainability approach. In their words sustainability is done by preserving the local culture by offering traditional music performances traditional cooking, dancing and exhibitions. When asked why not install solar panels they were deemed “not possible because the shade from the castle” (Respondent E, 2014i) “it would look bad because it is not the traditional architecture (Respondent D). Using eco labels, having a strategy for ecological footprints, water supply and waste was not done. “We only do what other hotels are doing and no one is using eco products” (Respondent E).

Cafes and Restaurant: The food quality is in general very good due to the fact that the country just recently started with pesticides and those have not yet accumulated in the soil, but the presentation is very bad in terms of aesthetic values. The coffee served is Turkish, cappuccino and espresso, no regular coffee exists. The interior of the cafés and restaurant is not in any particular design or style, plastic chairs with nice traditional carpets and table. Smoking is accepted indoors. The service quality is identified as an improvement area in general. GF has thus initiated a project where they will teach girls how to work in the tourism sector: service, reception skills, cleaning etc, it will be a 30 day course. The language skills create communication barriers and thus everyday misunderstandings between guests and hosts.

Activities: There are not many activities offered in Gjirokastra. “There is no entrepreneurship tradition in Albania, everyone just copies their neighbors business” (local business owner, 2014) Sightseeing in the old bazaar is the main one according to the visitor surveys. The old bazaar is easily distinguished from the new town with its cobbled streets but there is no gated “welcome” sign, there is no entering a world heritage feeling. There are also numerous ways

to enter the old town but there is only one map, close to the hotel Cajupi and bus park. Inside the heritage there are signs pointing to places of interests but they only state the name and there is no interpretative signpost or sign or information on the buildings themselves. “There have always been talks but not much has been done. The municipality did put up some signs that you can see around the town but they only have titles on them, no information and they are ugly too” (Respondent D, 2014). If one would be interested in hiking or nature activities there are no informative signs about the surrounding mountains but there are some old trails to be found however they have not been prepared for tourists yet.

Infrastructure: In the city of Gjirokastra there are two different types of infrastructure divided between the “old town” and the “new town”. The old town which is the UNESCO world heritage site, consists of steep narrow cobbled streets where big busses and trucks can´t maneuver. The new town which is downhill from the old town is more modern with roundabouts and traffic police who oversee the flow of traffic. At the end of the main road in the new town there are daily departures of minivans that depart every hour between 8 o´clock till 12 o´clock. These minivans work as the main public transport to and out of the city and there are direct minivans to Saranda which take about 1,5 hours. There are alternative routes for getting to different destinations as Tirana for example and depending on what busses are available one can take either a minivan from Gjirokastra or the buss. They later transfer the passengers to whatever destination one is heading for. In other words there is a perfectly synchronized system and the drivers are extremely helpful according to our experiences.

Tourism is starting to become established in the area, especially in the last year and there are a number of small hotels and guesthouses to accommodate visitors. There have been features on TV about the area which have resulted in increased number of tourist arrivals. It boasts 10 kms of coastline, partly rocky and partly sandy that is still undeveloped. There is an Italian project underway to prepare the beaches for tourism. The area was declared a tourist zone in 1994 stating that and no new buildings can be constructed within 200 metres of the lake shore. There has been interest in developing tourist facilities from investors from as far as the United States.

Because of the significance of hydropower to the electricity supply sector in Albania, this section focus primarily on issues and developments in regard to small hydropower plant (SHPPs) developments. However, many of the issues are relevant to other RE power plant types. Highlights of these developments are summarized below.

- **Increasing the reliability of payment for electricity deliveries to the national grid;**
- **Adopting a long-term Power Purchase Agreement (PPA):** The adoption of a standardized PPA regulating the terms, under which the power is purchased, reduced a major risk in financing SHPPs. The necessity of such a document was the key-message at the International Stake-holder, regulating the following major issues:
    a) PPA's validity: 15 years;
    b) Obligation of KESH -WPS to buy at any time the entire output of the plant at a tariff announced annually by ERE and determined according to the respective feed-in tariff methodology;
    c) Compensation clause for non-acceptance of power by KESH.

To improve this situation, Albania has to initiate a series of reforms to increase the sector's performance and develop alternative energy sources. An Electricity Market Model (EMM) was approved in March of 2008, which is characterized by bilateral contracts of electricity between and among market participants. Based on this market model design, the Regulator developed and approved the Market Rules and technical and commercial codes that facilitated power purchase agreements between small power producers and independent power producers and a variety of regulated and unregulated electricity suppliers.

Small Power Producers and Independent Power Producers may sell electricity on all markets, including to the Wholesale Public Supplier, with regulated prices or to Eligible Suppliers or Traders or DSO, at commercially agreed terms and if no agreement can be reached, on terms approved by the regulator. Also they may sell electricity directly to Eligible Customers if they obtain licenses to be Qualified Suppliers. Beginning from 2015, all non-household customers have been granted the right to become eligible consumers and choose their own suppliers.

In spite of these changes, Albania needs a more liberalized electricity market, better incentives for energy efficiency, and more clear rules to boost RE development. The adoption of these laws is crucial for sustainable energy reform. The intention is good, but unfortunately the time span to initiate and promote these laws was too long, decision was delayed, and a number of opportunities were lost because investors were reluctant to spend their money in a country where the legal framework is not yet attractive.

1) Adoption of challenging but realistic targets and trajectories till 2020 for renewable energy share in country's energy mix is essential to show GoA's commitment to deploy RE. Without it no action plan can be defined and appropriate policies developed. Also, the foreign investors in this domain will not be confident to come and implement RE projects in the country.

2) Without a clear, sustainable, and sure regulatory framework, the country cannot attract foreign investment in all domains but especially in the RE one. Concerning renewables, the primary need is for clear tariffs methodologies, a fair and streamlined licensing process, disputes settlement, and reliable green electricity billing. Any other delay of solving issues will cost country especially in this time of European financial crisis when the competition for investment is harsher. Albania will need donors' coordination in providing technical assistance to help GoA to solve this stringent necessity.

3) Some of the RE development related difficulties are common with the existing issues of the land ownership system. Improve land rights system is important for RE project because. Especially, wind, PV, and hydro projects require that the system of recording and assigning land rights, including accurate land ownership records, be improved to enable clear title to public and private land.

3. BRIEF REVIEW OF MUNICIPAL ENERGY SECTORS

3.1 Municipal Public Buildings

Service Sector is divided in two branches: Public Service and Private Service. The Public Service Sector has a traditional experience in the heat demand, based mainly on the old technology, installations and organization, but in some cases new schemes have been introduced. It should be underlined that space heating, domestic hot water and lighting for all sub-sectors is generally realized with a very low quality, due to old energy infrastructure in the public service institutions and lack of budget. Buildings located in Gjirokastra can be divided into two types of budget funding: central government and municipal. Due to a decentralized structure, only a minor share of buildings can be classified as general government-owned buildings. These include in particular heritage sites, such as fortress and castles, which are operated under the responsibility of the Ministry of Culture. Other public buildings which belong to central governmental agencies and ministries are hospitals, public security, justice and administrative buildings,

The Municipality of Gjirokastra is responsible for the operation and maintenance of the buildings within the city boundaries, including administrative buildings, schools, kindergartens and museums, libraries situated in different villages belongs to this municipality, etc.

Electricity consumption of municipal buildings is metered on a monthly basis and reported to the budget department of the municipality.

The annual supply of wood fuel and fuel oil / diesel is set by the municipality based on historic consumption data and available budget. However, real demand is mostly not met due to suppress of demand and high losses.

Schools and kindergartens are operated by the Department for Social and Education Development. In total, the municipality operates 58 municipal public buildings with a heated area of 18,950 m² including those public buildings located in villages, of which 28 are educational buildings (17 schools, heated area 10,200 m², 11 kindergartens, heated area 2,750 m²). The remaining other 30 municipal buildings have a heated floor area of 6,000 m² including 3 dormitory, the city hall, a culture palace and administration buildings. Other public buildings in the municipality that belong to the central government have a heated floor area of approximately of 2500 m².

Municipal agency of Social Welfare is responsible for the operation of kindergartens, schools, dormitories and policlinics. Municipality has budget limits for building heating: only limited amount of wood or diesel is purchased by municipality and delivered to the building, there are power consumption limits communicated with the directors of the facility, but no monitoring of consumption.

The municipality has full control over the 58 buildings, provides building maintenance, renovation, water, fuel and power supply.

The municipality has no authority over the operation and energy supply of the central government buildings located in Gjirokastra. The annual energy consumption of those non-municipal public building amounts to approximately 0.426 GWh and is considered in the energy balance. The total amount of energy consumed in 2015 by municipal buildings was 1.78 GWh, which includes consumption for space heating, lighting and electrical appliances, as well as some small electric hot water boilers. The specific heating energy consumption is approximately 150 kWh / m^2 per year, and specific power consumption for lighting, etc. 11

kWh/m².

Heating supply is mainly provided by wood stoves of very poor efficiency, while 2 kindergarten is using diesel boiler. The municipality intends to switch to wood pellet, wood chips, to increase efficiency, reduce operation cost and comfort. Kindergartens in Gjirokastra use electric heaters as second back up heaters and also hot water generation and few electric devices.

Heat supply for schools and kindergartens in winter is not sufficient. The installed individual wood stoves are operated for a few hours in the morning or late afternoon if the schools is with two shifts. During cold winter days the reported indoor temperature is between 10 and 12°C, while not all rooms are heated.

Lighting is usually provided by incandescent, CFLs and T5 tubes FL with sufficient lighting levels in most places. The electric wiring in the buildings almost depreciated and it very important to be substitute as soon as possible in order to guarantee safety.

Energy bill for public buildings is directly paid by CA, amounting to approx. 73,000 USD annually, which is equal to 48% of the municipal budget.

The existing public building stock was mostly built between 1950 and 2000. Buildings exhibit large heat losses through building envelopes and single-glazed windows, requiring a significant amount of heat energy for space heating. Heating supply is insufficient to provide normative heating. Reported room temperatures in winter are at 10-12 °C while corridors are usually not heated. Under the current situation (baseline), many buildings do not provide operation parameters according to norms and standards due to limitations of the municipal budget.

The municipality operates 4 daycare care facilities for children from 0-3 years, which are in bad condition.

Some small renovation measures, such as replacement of windows were implemented in some schools with local budget. Domestic hot water is only required in kindergartens and produced with electric boilers.

The municipality operates under “Nderrmarja e Sherbimeve Publike” for maintenance of all public building stock, to keep structures and performance of the schools and kindergartens in normal conditions. However, the municipality lacks funding for capital retrofits or major energy efficiency measures.

There is demand for increase the indoor room comfort in terms of temperature, full required number of hours, lighting, hot water (especially for the daily care and kindergarten) and for safety from stability point of view. In addition, structural buildings improvements in particular on the roofs to reduce the leakages are required to increase the lifetime of the buildings.

3.2 Street Lighting

Responsibility for operation and maintenance of outdoor lighting in the municipality is carried out by the public service company of the municipality of Gjirokastra “Nderrmarja e Sherbimeve Publike”, Bashkia Gjirokastra. They perform repairs only with a lift truck if malfunction is reported and procure small amount of specific equipment e.g. for lamps/inductors.

Gjirokastra Municipal Service Enterprise is a legal entity and in 100% ownership of the municipality and hence, maintains full control and influence on this sector. The total amount of electric energy consumption in 2015 was 480,000 kWh. The annual electricity costs for this

sector amount to 70,122 USD per year. Total road length amounts to 28 km, out of which only some km are lightened. Gjirokastra has only a limited number of main streets, of which only part of two are lightened.

The frequency for the replacement of conventional high pressure mercury and CFL bulbs is very high (every 1 to 2 years). For sodium-based lamps, replacement is required every 3 to 4 years.

The currently installed street lights have partly old lamp covers, which makes it difficult to simply replace the bulb with an LED matrix. In addition, the light distribution could change significantly which could lead to dark spots on the road surface.

The annual average operating hours amount to 3,535 hour per year.

The electricity for SL is provided by the local power utility at a voltage level of 220 V with the same distribution network as residential customers. For each street or defined segment there is a street lighting cabinet installed with power meter.

Operation control of street lighting is accomplished semi-automatic: the lighting is switched on and off automatically each day, but the switching time is set (and changed) manually by the staff each month – according to “experience”.

In some luminaires designed for high pressure Sodium lamps (150 W/250W), the lamps were exchanged by CFLs (80W or lower) to reduce power consumption, which have brought poor light level, high maintenance costs (lamps fail earlier).

3.3 Potable Water Supply

Water supply and waste water services are provided by the Kompania e Ujesjelles-Kanalizimeve Gjirokastra SH.A[1] servicing all customer groups in the City of Gjirokastra as well 50 villages in the municipal area.

Kompania e Ujesjelles-Kanalizimeve Gjirokastra SH.A is s 100% subsidiary of the municipality. The water utility is performing with losses, which have been very high due to totally depreciated 50 years system. The situation is improved significantly starting with the investment carried out from the KfW and it is worthy to be mentioned that first phase will be finalized end of this year 2016. Also, it is important to point out that all categories of customers are very good payers compare with all other municipalities in Albania. The municipal administration as owner controls water supply-sewage Kompania e Ujesjelles-Kanalizimeve Gjirokastra SH.A operations, performance and financing. Due to the predominant use of gravity flow, average specific electricity consumption for water supply at the utility side is high with 0.26 kWh/m^3. However, energy consumption on the side of most residential and commercial water subscribers is high and can account for up to 40% of their power consumption to ensure uninterrupted individual water supply with individual storage tank and

[1] Joint Stock Company “Water supply-sewerage Gjirokastra”

pump.

Approximately almost all subscribers use individual water pump of 1.2 kW for average 3 hours per day. The reported electricity consumption for water pumping in residential sector is approximately 50-60% of their energy bill. In case this additional individual power consumption of annually approximately 10.385 GWh is considered, the overall average energy consumption for water supply at the end consumer side amounts to almost 2.3 kWh/m³ (poor performance).

3.4 Waste Water Services

Almost 90% parts of Gjirokastra City have waste water collectors with normal condition of this system and the absence of a waste water treatment plant, waste water is lost in the collector system while the rest is disposed into the Drinos river. These waste water collectors are covered by the loan of KfW. The construction of a waste water treatment plant is urgently needed. WWTP is planned to be constructed 6km from city and currently there are no fund secured. There is not any preliminary concept design for the time being.

The municipality obliged Kompania e Ujesjelles-Kanalizimeve Gjirokastra- SH.A with the operation of the collector system. The municipal administration as owner controls Water supply-sewage Kompania e Ujesjelles-Kanalizimeve Gjirokastra SH.A operations, performance and financing. There are currently no energy consumers in the waste water sector, which is totally depreciated system and discharge is done on Drinos river creating environmental problems.

3.5 Municipal Solid Waste Services

The Department of Transport, Civil Emergencies and Services is responsible for cleaning, waste collection and disposal in the municipality and the service collection is carried out though the municipality established the subsidiary company. The municipality has full control over the waste service and finances the expenses of the municipal subsidiary company through the collected fee revenues. The waste company operates four vehicles and all of them are consuming approximately 46,350 liters of fuel (2015), or 570 MWh per year.

Billing of waste service is done per household or legal entity together with the waste supply bill; during last year collection rate was increased to 90%. Plan to establish regional landfill 16 km away from Gjirokastra together with additional 5 municipalities, total investment costs 5-7 M EUR, capacity 30 years,

3.6 Municipal Public Transportation

The municipality can oblige companies to comply with minimum energy or emissions performance standards in case of for extension or issuance of new licenses. Each inhabitant of Gjirokastra travels on average 4 km per day using different means of motorized and non-motorized transportation. The non-motorized transportation mode split (by foot, horses (villages) and bike) is approximately 3%[2]. Actually there are no bus lines in the city, so public transport almost does not exists. In addition, about 100,000-120,000 tourist are visiting Gjirokastra and travel with taxis and busses. This sector is an important economic factor for the city. Regional centers and villages are served with 7 mini-bus lines in the city plus to villages, 12 mini-busses and 1 large bus. Gjirokastra municipality has licensed 1 private

[2] Calculation according to expert estimates and interviews with inhabitants.

company with an period for 5 years. Also these lines are serving the village of Lazarat (4.000 inhab.) including 9 mini buses. Municipality has no power to increase requirements for better performing vehicles for new licensing Total annual capacity of passenger transport is about 5.672 million passenger km.

3.7 Residential Sector

Energy consumption in residential sector is divided in five parts with different characteristics: space heating, air conditioning, domestic hot water, and cooking, lighting and electric appliances. Residential sector occupies the second place in the consumption of energy resources in the country and first sector under the municipality. As a consequence, it is important to know the consumption of electricity, fuel woods, LPG and diesel for each service. Energy supply and demand for space heating, cooking and domestic hot water (using mostly fuel woods) remained in balance. After 2005, there was a massive decline of fuel woods supply from forest to residential zones in Gjirokastra area. This resulted in a massive cutting of fuel woods (most illegal) and overload of electricity equipment (substations, transmission and distribution lines).

11,100 households are registered in the Municipality of Gjirokastra with an average living area per household of 80 m² and average number of 5 people per household.

3.8 Commercial Sector

Service Sector is divided in two branches: Public Service and Private Service. Private Service Sector is a new experience aiming at a rapid introduction of modern technology and installments, but improvements are needed regarding the efficient utilization. Private service sector has inherited some traditional repair-service and small shops/restaurants that have neither possibility nor demand for space heating and air conditioning. Meanwhile, in many services, the private sector has experienced modern and qualitative developments. This service group includes business categories such as hotels, restaurants, banks, tourist agencies and insurance offices, etc. as well as many parallel services with the public service such as education, culture, health, etc, aiming the maximal comfort.

3.9 Private Individual Transportation

Private Individual Transport Sector plays an important role in the consumption of energy resources. The evident increase of the number of the transport modes after 1990, especially in the road transport, was accompanied with increase of transport activity and an evident increase of the fuel consumption, mainly diesel and gasoline. This is the basic indicator that is used as driving factor to calculate the energy demand of the sub sector are passenger-km per person per year and ton-km per person per year. There are no information on the age and conditions of the vehicles but it can be assumed that private cars consume on average 10 litres fuel per 100 km or 1.07 kWh per passenger km.

4. DEFINITION OF GJIROKASTRA AS GREEN CITY

4.1 Definition of a green city and approach for EBRD

There is no universally accepted definition for what a green city is, or universally observed practical approach to it. As shown in Annex 1 and Table 1, many stakeholders have contributed to environmental activities in cities but often through different angles, for instance by working on specific urban sectors, or by adopting a broader approach of urban sustainability where economic, social and financial sustainability are primary parameters on equal footing as environmental indicators. As a result, there is a lack of consensus and clarity on what could be defined as a green city.

This report proposes a definition of a green city emphasising the environmental performance of such a city. Social and economic performance are therefore not the primary target – although they also constitute important characteristics of a green city and will be useful to consider in priority setting, monitoring and evaluation of green city activities and services (cf. next sections for more details). *A Green City is a city which shows high environmental performance relative to established benchmarks in terms of i) quality of environmental assets (air, water, land/soil and biodiversity),*

> *ii) efficient use of resources (water, energy, land and materials) and iii) mitigating, and adapting*
>
> *to, risks deriving from climate change, while maximising the economic and social co-benefits and considering its context (population size, socio-economic structure and geographical and climate characteristics).*

It is important to give clear distinction to a green city from the following existing concepts, although partly overlapping:

- **Sustainable city**: this concept is broader in scope and includes objectives of economic growth and social equity and justice as primary parameters alongside environmental performance. It is also more ambitious and applying a concrete methodology may be more challenging.
- **Smart city** (also known as or similar to other concepts such as “digital city”, “intelligent city” or “knowledge-based city”): this concept has often been used in different and inconsistent ways, resulting in some confusion about its added value. A common understanding, as articulated in recent studies of the OECD *Green Cities Programme* (*Green Growth in Bandung, Indonesia*, forthcoming), is that smart cities use Information and Communication Technologies (ICT), or digital technologies, to make the critical infrastructure components and services of a city more interconnected and efficient. There are many applications and potential objectives of using such digital technologies, and not only to improve cities’ environmental performance. In other words, smart city tools can be a *means*

to support green cities.

Resilient city: the basic idea behind the concept is that resilient cities are prepared for and able to withstand shocks of different natures (environmental, economic, political, social etc.). The concept is still vague and lacks a practical definition. One of the most concrete aspects of this approach is resilience to natural disaster risks, which is a sub-set of the above green city definition and the approach below.

In addition, this report proposes a definition of a *Green City Approach*. While a green city is defined as a "state", or level, of environmental performance, it is also useful to have a common understanding of "actions" that are relevant to maintain/enhance the environmental performance. There are indeed a range of actions to address cities' environmental problems, with some more relevant to EBRD's Green Economy Transition mandate, its Municipal Environmental and Infrastructure Strategy, and cities' policymaking responsibilities:

A Green City Approach is an integrated, multi-sector process whereby a city's environmental challenges are periodically identified, prioritized and addressed through targeted investments and services, regulations and other relevant policy instruments with the aim to enhance the city's environmental performance in a cost-efficient and financially sustainable manner, while at the same time seeking to maximize the economic and social co-benefits.

4.2 Environmental, economic and social objectives of a green city

The proposed Green City definition and approach considers three environmental dimensions to be addressed in priority: *i)* quality of environmental assets; *ii)* efficient use of resources, and *iii)* climate change risks. This can be translated into more targeted objectives as listed in **Table 3** below.

Table 3. Green cities' environmental dimensions

General environmental dimension	Targeted environmental dimension
Quality of environmental assets	Air quality
	Water quality
	Land/Soil quality
Stock of resources	Water resources availability
	Green space availability
	Biodiversity and ecosystems
Climate change risks	Mitigation (greenhouse gas emissions)
	Adaptation (resilience to climate change risks)

The proposed definition also includes economic and social dimensions linked to the

environmental dimensions which should be taken into account to fully grasp the ins and outs of a green city. The main economic and social dimensions and objectives relevant to a green city are listed in **Table 3**. As outlined in the definition of a *Green City Approach*, actions to enhance a city's environmental performance should also seek to maximize economic and social co-benefits. These links between economic, social and environmental objectives will provide additional motives for city leaders to undertake green city actions. For instance, a green city activity which can generate substantial employment co-benefits can easily be justified and prioritized compared with other green city activities with less positive economic impact. Also, providing access to clean and efficient water, energy and solid waste collection services to all urban residents (including in slums) will not only enhance cities' environmental performance but also meet social objectives. Conversely, an urban population with high environmental awareness will be more likely to use sustainable infrastructure systems (public transport, use of separation garbage) and encourage elected governments to adopt a green city agenda.

4.3 Key economic activities and services to be addressed under a Green City Approach, and relevance to EBRD's mandate

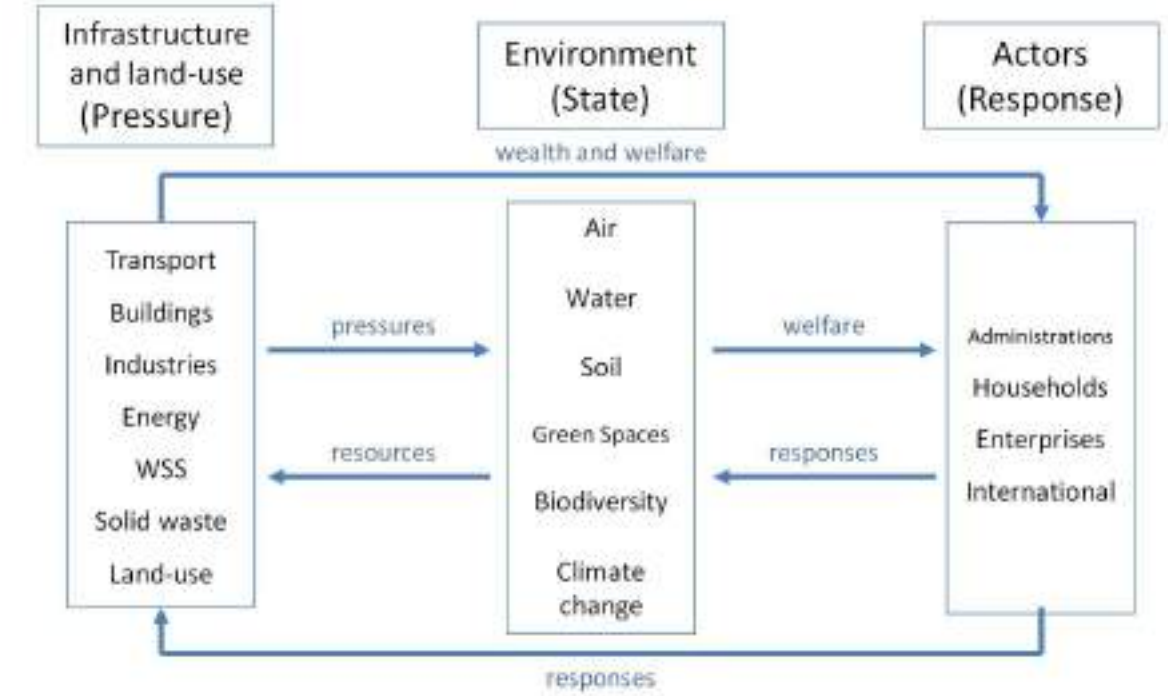
A Green City Approach requires identifying, prioritizing and addressing a city's environmental challenges through targeted investment and services and other relevant policy instruments (regulations, etc.). In this regard, there is a wide range of urban economic activities and services that can be targeted to address urban environmental challenges. The targeted environmental dimensions presents identifying sources of pressure on urban environmental performance and their relevant sector. It expands this approach and provides a more specific list of economic activities and services categorized by the following seven sectors identified: transport (public transport, fuel efficiency, traffic and parking management), buildings (energy efficiency [EE] in buildings), industries (energy efficiency [EE] in industry), energy (energy supply, renewable energy [RE]) [2], water (water supply, wastewater, efficiency of water use, and drainage), solid waste (collection, treatment), and land-use. The same table also identifies responses to each economic activity and service factor that are relevant to cities or EBRD.

4.4 The Pressure-State-Response approach: conceptualizing the causal linkages between green city components

The causal linkages elaborated above support the need to adopt a **Pressure-State-Response (PSR) approach to conceptualize green cities.** The PSR approach was developed by the OECD in the 1990s and re-used in the OECD's *Green Growth in Cities* (2013). Human activities exert *pressures* on the environment and change its *state* in terms of its quality and its stocks of resources. Society *responds* to these changes through general environmental, economic and sectoral policies, and through changes in behavior, thus affecting the *pressures* caused by human activities. The original PSR framework is adapted to the city level and made coherent with the green city definition as well as the

environmental dimensions and sources of pressure conceptualized in section 3.2. **Figure 1** presents the Green City Pressure-State-Response framework. The Green City PSR framework will be critical to organize indicators and develop a green city action prioritization methodology (cf. section 3.3).

Figure 2. Green city Pressure-State-Response framework



5. GJIROKASTRA GREEN CITY STRATEGIC PLANNING INSTRUMENTS: BENCHMARKING AND PRIORITIZATION

5.1 Review of existing international best practices on Gjirokastra green city strategic planning instruments (indicators, benchmarking and prioritization)

There is little consensus on which urban environmental measures and implementation methods cities should employ for green city development. Many studies have attempted to conceptualize green city or sustainable city models and elaborate on how to translate them into action at the city level by analyzing green city / sustainable city indicators, policy instruments and action planning. This report reviewed existing studies and research on indicators and action planning.

5.2 Gjirokastra Green city indicators: the need for a conceptual framework

There are several key observations from the results. A general overview of indicators' characteristics is below:

- The comprehensive character of environmental activities (in particular studies) and the lack of uniformity of approaches to promote green / sustainable cities, as mentioned in the previous section, are reflected in **the heterogeneity of existing indicators**. While some studies have only included a few indicators which are purely environmental (e.g. air quality, pollution of the environment), others have included a broader range of indicators covering topics other than the environmental performance of cities. The OECD's work promotes the green growth concept, with indicators focusing on economic growth and some social considerations. The IADB uses a sustainable city concept and employs one of the most comprehensive sets of indicators which include governance indicators. ISO 3721 also employs a broad range of indicators (e.g. economy, education, environment, governance, urban planning…)

- **Another factor of heterogeneity is the inclusion (or not) and the inconsistent use of indicators referring to the response (i.e. policies, investment, behaviour) of municipalities**.; For example, Siemens' Green City Index includes indicators on the presence of environmental master plans. IADB's ESCI also included some response indicators (e.g. disaster risk master plan, early warning systems) but only sporadically. The OECD, taking a different approach, did not include indicators on policies. Instead, OECD green city indicators refer to the quality and availability of environmental assets and their causes from the performance of urban infrastructure and the economy. Specific policy response are not measured but rather analysed in depth and recommended in each relevant sector for green growth.

- In this regard, a review of existing indicators suggests **the need for a**

conceptual framework guiding indicator selection and use for green city action planning processes. Such conceptual framework should be linked to a clear green city definition and make sense of causal linkages between indicators, which is rarely the case in existing activities. In Section 3.2, this report proposed the Pressure-State-Response (PSR) framework as a green city diagnostic tool.

- **There is a general lack of baseline/benchmark**. This is due in part to the complexity of conceptualising green / sustainable cities (which may imply a large number of indicators) and the lack of established standards. Likewise, there are few attempts to track the evolution and progress of cities' environmental performance over time. IADB's ESCI's benchmark effort is the most comprehensive of existing studies. OECD has tried to come up with indicators which are internationally comparable (using Functional Urban Areas[4]), although the data availability is an obstacle to develop such a methodology.

- **There is a lack of standard means of displaying results**. Some indexes have attempted to visualise the results in a performance "web" (Siemens), others have adopted a traffic light approach (IADB); others have not applied any scoring methodology (OECD, ADB).

- Overall, the most recommendable pieces of work on indicators are **ISO 37120, IADB's ESCI, OECD Green Cities Programme, and Siemens Green City Index**.

The study identified four international practices for green city action *prioritisation* (including initiatives which covers broader policy areas): the **Asian Development Bank's Green City Development Toolkit**; the **Inter-American Development Bank's Environmental and Sustainable Cities Initiatives (ESCI),** the **Clean Development Initiative for Asian Cities' City Infrastructure Investment Programming and Prioritisation Toolkit** and **the Centre for Low Carbon Futures (CLCF)'s *Economics of Low Carbon Cities Series***. Only IADB makes a thorough use of indicators as a support within a broader framework of prioritising action. In addition, it is the only study which has developed a benchmarking methodology embedded in a complete prioritisation process. The main lessons are:

- **IADB's ESCI** is the most complete methodology for benchmarking and prioritisation, thanks to a scientific and thorough use of indicators and also the application of five filters (the traffic light scoring of indicators, public opinion, climate change, economic impact, and multi-sectorality). It links the indicator section to the planning process more clearly than ADB's Green City Development Toolkit, for instance. Indicators are part of a wider green city action process which includes in order: preparation (e.g. form work

teams), analysis and diagnostics (i.e. the traffic light exercise), prioritisation (integrating variables such as economic cost), and formulating the action plan. It could serve as a basis for a green city action benchmarking and prioritisation for our purpose, although their indicators are not specifically focusing on green cities (they are aiming to cover wider issues). The use of response indicators is inconsistent, however and should be refined. Another possible caveat is that, whereas the prioritisation filters are applied to identify problems, no methodological process is proposed to select policy options to address problems. In other words, there is a policy gap in this methodology (the programme helps you to identify problems but does not tell what to do). In addition, the application of filters may also need to be simplified to make sure this can be used by city administrators;

- **ADB's Green City Development Toolkit** adopts an assessment matrix promoting comprehensive approach of prioritisation by not only looking at a city's environmental performance in each sector of infrastructure related to green cities, but also looking at financial, governance and implementation obstacles by sector. A traffic light methodology is recommended to score these elements in each sector; however, the link between the choice of colour and the indicators is unclear and is mostly left to city administrators' appraisal. There is no indicated benchmark for each indicator. Also, there is no additional filter (e.g. economic and social impacts, public opinion) to further prioritise action;

- **Cities Development Initiative for Asia (CDIA)'s Infrastructure Prioritization Toolkit**'s principles could also be applied to green cities. The approach is however different from ADB and IADB in the sense that there is no assessment of needs through indicators as the initial step. Instead, the selection of projects is made as a wish list by city administrators, and refined through an assessment of the city's financial capacity. This approach will not be retained here as more thorough green city diagnostic is recommended to priorities action.

- The **Centre for Low Carbon Future's *Economics of Low Carbon Cities Series*** has developed a model for assessing the costs and carbon effectiveness of a wide range of the low carbon options that could be applied at the local level in households, industry, commerce and transport. It is more a detailed scientific study focused on CO_2 emissions and cost-benefit of low carbon measures. Replicating it for every green city sector is probably too ambitious and not practical.

In summary, IADB's ESCI is a good model for green city action prioritization. It must however be narrowed down to specific environmental issues. Additional filters such as financing and implementation issues – as used by ADB and CDIA – but also social impacts to build links between EBRD's Green Economy Transition Approach and Social strategies could be used. It must also be noted that none of the above studies analyses green city policies on a sector by sector basis. They instead propose a methodology to identify environmental issues and their sources, yielding an action plan. However, there is no discussion in the same studies of what kind of policies should be undertaken to tackle each sustainability issue. The response aspect of their framework is therefore weak or absent. There are a few more practices which could be relevant for green city action *benchmarking.* However these studies do not use indicators as an instrument for prioritising green city actions. The two main specific initiatives on green city benchmarking are **Siemens' Green City Index** and the **European Green Capital Award**. Another noticeable initiative is **City Blueprints** on water management. However, both mostly benchmark cities' environmental *performance* and not green city *action*. The main lessons are:

- **Siemens' Green City Index** (also referred to as Economic Intelligence Unit (EIU)'s Green City Index) is the most complete benchmark for green city. Siemens also created a similar version was created for other continents. A more meaningful approach however would be to give a score to each city's green sector only, and not an overall score. In addition, it is more suitable to drop the 'response" (policy) aspects from the methodology, as it is difficult to give an objective rating.
- The **European Green Capital Award** is less thorough and rather "ranks" cities relatively to one another, without benchmarking based on a set of measurable indicators.
- **City Blueprints'** methodology is a bit more similar to Siemens' Green City Index, but also less thorough as there is no clear link between the indicators used and the ranking 0 to 10. The performance web could be useful to replicate if any benchmarking on green city is to be done.

5.3 Proposed Gjirokastra green city benchmarking methodology

Benchmarking and prioritising green city action will require thorough instruments of assessment and comparison in order to evaluate cities' environmental performance and determine priorities of action. In this regard, indicators should be central instruments for benchmarking and prioritising green city action in the most "scientific"/objective way possible. IADB's ESCI, which is the most advanced benchmarking and prioritisation methodology, also makes an intense use of indicators. However, as pointed out in section more work is required to establish boundaries between indicators that relate to green cities and those which do not, and to conceptualise the causal linkages between green city indicators.

The proposed green city indicators in this document deviate from IADB's ESCI methodology in the sense that they focus exclusively on green cities (and not sustainable cities) and are articulated along the **Pressure-State-Response (PSR) approach** presented. The Green City indicators (and the benchmarking and prioritisation methodology) are categorised in a PSR framework to give a sense of the causal linkages in a green city, which is not conveyed in IADB's work. Within the "state" and "pressure" categories, an additional sub-classification of indicators is applied, between "core" indicators and "elective" (or "optional") indicators. The purpose is to limit the number of necessary indicators. As explained below, only the "core" indicators need be taken into account in the prioritisation process. The "elective" indicators instead provide a menu of options in the event that the "core" indicator is not available in a given city.

- **Pressure**: this category refers to indicators measuring the sources of pressure and adverse impacts on the environment from human activity the environmental performance of the city. It relates to urban infrastructure (transport, energy, water supply, sanitation and drainage, solid waste) and land-use. There are 26 core indicators (59 indicators in total);

- **State**: this category refers to indicator that attempt to measure the state, condition or quality of the city's environment 'State' indicators also measure the stock and quality of natural resources. The quality and availability of environmental assets, and climate change risks are the three main 'state' subcategories, composed of 9 core indicators (20 indicators in total);

- **Response** indicators attempt to measure beneficial impacts of activities – actions to reduce pollution or consumption of resources or investment in environmental protection. This category refers to indicators measuring the aspirations, in terms of policymaking and instruments, of a city to become green, in each of the sectors listed in the other two tables on "pressure" and "state". This category is mostly qualitative and includes an assessment of the quality of implementation of green city policies. It is composed of 35 indicators.

5.4 Criteria for indicator selection and potential indicator challenges

Indicators were selected assuming they respond to the following criteria: relevance to the green city conceptual framework laid out, measurability, analytical validity, cost effectiveness, and practicability (i.e. indicators are not too complex). However, the proposed indicators need to be tested on the ground with several cities and refined if necessary. The data source will be recorded to ensure data quality, comparability and consistency of the baseline (review). For the same reason, the source of benchmark will also be recorded. Assessing and benchmarking a city's green performance, and establishing priorities through indicators will meet a range of

issues related to data availability, collection and quality. Any city undertaking to assess its green performance must bear in mind the following obstacles:

- **Availability**: Some detailed indicators such as the proportion of population living within 20 minutes of everyday services, may not be available in some cities (i.e. it has never been produced by anyone / any stakeholder). The practicability of collecting the proposed indicators

- **Reliability**: For instance, air quality measurement is often taken in only a few spots in the city, and is not frequent. Some indicators may be difficult to measure (e.g. percentage of households at risk). Available but

- **Scale:** If covering only the core city of a metropolitan area, some indicators may be misleading and do not reflect the environmental performance or urban pressure on the environment (e.g. the quantity of

- **Ownership**: The previous point raises the issue of ownership: collecting and gathering data will require contacting a range of agencies (national and local government, state or provincial government, private utility firms…). This may also create obstacles to harmonise the scale of indicators (e.g. indicators are produced by different agencies and

- **Comparability (if two or more cities' green performance are compared):** comparing some indicators such as water consumption per capita or renewable energy supply as a share of total energy consumption may be misleading if comparing cities with very different

- A **"trend" column** informing about the evolution of the value for each indicator over the past 5 to 10 years. This should be useful in order to understand dynamics of green cities over time and the evolution of the city's performance. Concretely, the information provided will be used to further prioritise green city challenges, if necessary.

Indicators informing on the **sources** of environmental degradation identified in the "state" indicator table. These should be particularly useful to understand the links between the environmental issues in the "state" table and which "pressure factors" exert the most influence on them.

The projected timeframe for the collection of the green city PSR indicators is 4 months for the first green city action plan cycle (12-24 months). The first data collection process is more demanding due to need to organise the workforce, locate the necessary data or produce it out of other statistical knowledge. The indicator

collection process in the following green city action plan cycles will draw upon the first inventory, therefore it is estimated that from the second cycle, the indicator collection process can be reduced to 2 months. Due to the crucial importance of indicators to identify green city challenges and prioritise action, and the intense work that will be required to collect them, the cost estimate of the collection process is around EUR 50 000.

5.5 Benchmarking methodology: "traffic light" screening of state and pressure indicators

Green city indicators will be used to benchmark cities' performance. The benchmarking exercise will also be used as one of the steps of green city action prioritisation, as explained in the next section. This section will elaborate in more details on the benchmarking methodology first.

The *state* and *pressure* indicators should be used to benchmark cities. Response indicators are difficult to benchmark because they are entirely qualitative and "respond" to existing problems. A city does not need to respond to a problem that does not exist (for instance, a city does not need a disaster risk master plan if it scientifically proven that it is safe from all type of natural disasters). Instead, response indicators should be used in a second screening step to identify policy options that should be considered in order to tackle the state and pressure issues initially identified (cf. prioritisation methodology below). Likewise, additional supporting indicators (sources and trends) are not used for benchmarking.

A **traffic light screening**, as used by IADB, is applied to each indicator to simplify the assessment (green light = high performance; amber light = medium performance; red light = low performance) and compare cities' performance against established benchmarks or proposed indicative benchmarks. The thresholds for the traffic light screening should be established combining the following methods:

- Use international standards (such as WHO air quality standards), EU Directives and national laws, when applicable.
- When standards and laws are not applicable, it is recommended that the proposed boundaries between each of the three "lights" be checked within the EBRD. They should follow data ranges extracted from the literature for quantitative indicators, and subjective boundaries for qualitative indicators. Benchmarks could be established based on literature indications on cities' performance in the world, or according to national averages, if the data is available. The latter option would help to avoid comparing a city performance with benchmarks established from data in cities with very different demographic, geographic, economic and climate profiles.
- From the above remarks, it is recommended that EBRD establishes country-specific benchmarks data in order to follow national standards and laws.

Such visualisation will help to better assess priorities and transfer the data into the technical and political decision-making process as well as to communicate and engage relevant stakeholders as effective as possible given their (commonly) limited time availability. The application of a traffic light screening to the Green City state indicators will help to identify the most urgent environmental problems (topics) faced by the city marked as “red”, while highlighting areas of compliance and green city quality marked as “green”. As such, the traffic light screening is a central step of the green city action prioritisation process detailed below. The indicators and benchmarking methodology will not only be used for prioritisation but also evaluation and monitoring of green city actions. For instance, if a city wants to assess the effectiveness of extending the local bus system in order to reduce GHG emissions from the transport sector, the following aspects should be measured using the benchmarking methodology:

- How many buses and new connections have been introduced (response);
- The impact of the measure on the number of passengers in public transport, or on the use of private transport modes (cars, motorcycles) (pressure);
- The impact of the measure on air quality and CO_2 emissions (state).
- Proposed green city action prioritisation methodology

5.5.1 Map external framework conditions

This includes financial status, governance and management inventory and analysis.

5.5.2 Map environmental and linked infrastructure challenges

This is the step when the city staff collects and assesses the “state” and “pressure” indicators, including additional indicators in the “state” indicator table. The assessment is done by applying the benchmarking methodology (traffic light screening) and the analysis of trend over time

5.5.3 Map local policy framework

This is the step when the city staff collects and assesses the “response” indicators. The assessment is done by applying the traffic light approach which uses in this case more qualitative thresholds compared to the “state” and “response” indicators.

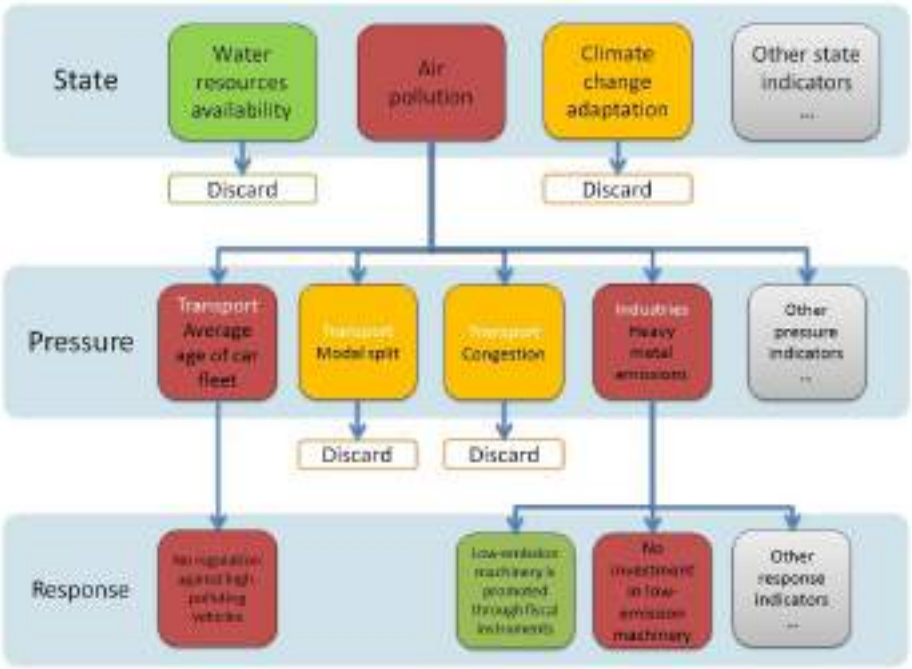
5.5.4 Technical analysis undertaken internally within the municipality’s workforce

Select “state” indicators which show urgent need for action. “Core” state indicators (highlighted in blue-coloured cells) marked as “red” from the application of the traffic light screening should be selected. If a city fails to provide a “core” indicator, one of the elective indicators from the same category in Annex 5 can be used. If the traffic light benchmarking results in a great number of red-flagged indicators, the

trend analysis can be used to further prioritise among the red- flagged indicators (e.g. only red-flagged indicators with declining and / or stable trends are selected). If, on the contrary, the traffic light benchmarking results in no or very few red-flagged indicators, amber indicators should be considered and the trend analysis can also be used to further prioritise among the amber-flagged indicators, if there are many of them (i.e. only amber- flagged indicators with declining trends are selected).

Select "pressure" indicators which show urgent need for action. The first step to do so is to link the selected "state" indicators (i.e. those that show need for urgent action) to the corresponding categories of "pressure" indicators (e.g. air pollution issue linked to transport sector) through the use of the additional indicators located in the right column in Annex 5. Once this is done, "core" pressure indicators (highlighted in blue-coloured cells) marked as "red" from the application of the traffic light screening should be selected. If a city fails to provide a "core" indicator, one of the elective indicators from the same category can be used. If the traffic light benchmarking results in a great number of red-flagged pressure indicators, the trend analysis can be used to further prioritise among the red-flagged indicators (e.g. only red-flagged indicators with declining and / or stable trends are selected). If, on the contrary, the traffic light benchmarking results in no or very few red-flagged pressure indicators, amber pressure indicators should be considered and the trend analysis can also be used to further prioritise among the amber-flagged indicators, if there are many of them (i.e. only amber-flagged indicators with declining trends are selected).

Figure 3. Green city baseline problem "tree" using the traffic light benchmarking methodology



Identify "response" gaps. This should be done by selecting "response" indicators corresponding to the pressure indicators marked as red, by applying a qualitative traffic light screening. The result is not specific response gaps but general ones (lack of investment, lack of regulations etc.). However, it is important to note that the traffic light screening of response indicators should aim, as much as possible, to indicate both the presence or absence of policies and the quality of those policies. Further, analysis will sometimes be necessary to understand the response "gaps". For instance, some pressure indicators may be identified as a priority while the response table shows that there are already policies and/or investment in this area. A more detailed analysis may reveal that existing policies are not well implemented, or not ambitious enough.

At this stage, a diagram of indicator "traffic light" could be drawn as a way to visualise the main green city challenges. Such diagram can also serve a sort of "problem tree" to visualise the causal linkages between the red-flagged PSR indicators. **Figure 3** provides an example.

Note: This diagram shows the outcome of the technical analysis under a scenario where there is no need to further prioritise with the trend analysis. In other cases, some red indicators may be discarded or some amber indicators may be selected through the trend analysis (see text above for more explanations).

5.5.5 Stakeholder-based analysis of green city challenges

The green city challenges identified as a result of the technical analysis within the city administration – i.e. the green city baseline problem "tree" – should be checked and complemented through a stakeholder consultation. External experts and citizens representatives will confirm or dispute the relevance of identified green city challenges. Critical economic and social dimensions linked to the environmental dimensions will be taken into account to refine the prioritisation of the challenges. This can be done in a larger group that involves a broader range of stakeholders, gathered in a workshop. A SWOT analysis has proven to be an appropriate tool for this assessment, but other methods can also be applied. Guiding questions can help to set links between socio-economic development and environmental dimensions and derive priorities (e.g. which environmental dimensions impact socio- economic development of the city at most?). Results will be thoroughly documented.

5.5.6 Political assessment of green city challenges

Political assessment: this is a formal assessment of the results of all previous steps in order to politically determine priorities to address in the Green City Action Plan. The assessment will take due consideration of available means, financial resources and personnel and technical capacities available for the forthcoming implementation period. Findings of the baseline review will be presented in different ways depending on the targeted audience. Political ratification of priorities set by relevant bodies is advantageous, with the aim to obtain a strong mandate for continued action. This does not necessarily require a formal Council approval yet, but offers an opportunity for political debate, review and recommendations. In any case, the Council should formally 'take note' of the Green City Baseline.

6. PRIORITISATION OF GJIROKASTRA GREEN CITY ACTIONS

6.1 Technical analysis - select and prioritise green city actions (undertaken internally within the municipality's workforce)

1. *Review existing green city policy instruments*. Strategic objectives of the vision will be transformed in operations and actions. The first step in this process is a consideration of the response gaps identified in the prioritisation of green city challenges. Existing instruments and procedures in these areas will be confirmed or adapted to more efficiently and effectively achieve the objectives of the Green City Action Plan. Also, gaps within locally applied policy instruments' purview for addressing the strategic objectives will be identified as a basis for the next step.
2. *Select new green city policy options.* Following on from the identification of response gaps to address the strategic objectives, new policy options

and measures will be reviewed, considered and adopted by relevant bodies including stakeholders. It is recommended to organise an interactive workshop to do so. The selected options should ideally be arranged into "packages" reflecting financial, policy, operational, technological requirements.

3. *Prioritise green city policy options.* Each policy option selected in the previous step should have "filters" applied to it in order to determine the degree to which it will bring environmental, economic and social benefits. Once the filters have been applied to all policy options, the City can select those that receive the highest scores. Existing prioritisation methodologies used by other organisations (described in section 3.1) have all adopted a filter screening methodology to prioritise green city actions. A similar methodology is included in the green city action prioritisation methodology, based on a new set of filters. The filters proposed to reflect the types of "benefits" that green city actions should aim for are listed in **Table 7** below. These are mostly taken from the table on environmental dimensions, and economic and social collaterals of green cities in the previous section 3.2 The choice of prioritisation filters should be flexible, and reflect the prioritisation of green city challenges (or baseline conditions) carried out in Step 1.3. For instance, selected environmental filters should reflect the main environmental challenges identified as priorities (e.g. air pollution, climate change mitigation).

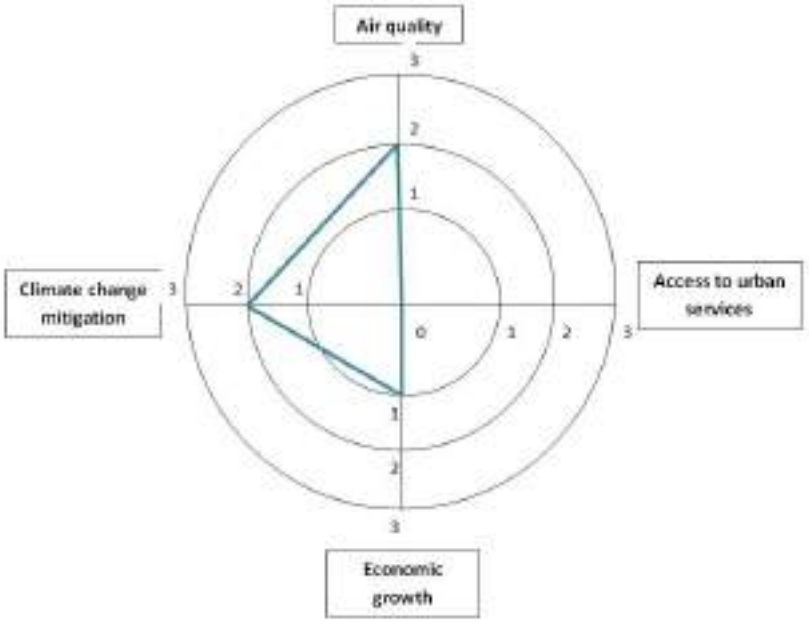
The degree to which each policy option addresses improvements in performance of each selected filter could be measured from 0 to 3, 3 meaning "highest" and 0 "lowest" (A similar approach is adopted by IADB's ESCI. ESCI also aggregate each numerical value using a mathematical formula in order to show an overall prioritisation score for item. The present report rather recommends visualising the values given in each filter in a web integrating all filters (**Figure 4**). Applying a mathematical formula to integrate all filters may create unnecessary biases in the assessment of priorities. Visualising the filters in a web instead give a more practical approach to policymakers. If a city nonetheless insists to weight the different filter categories, separate webs could be created according to the importance given by the municipality to each filters. For instance, a web on filters given high priority could be made separately from two webs of filters given medium priority and low priority. Another option could be to separate webs according to environmental, economic and social filters.

Table 7. Menu of green city policy prioritisation filters

Type of filter	Nr	Menu of specific filters to be selected by the municipality (impact of the selected measures on…)	Filter score (3=high; 2=medium; 1=low; 0=none)
Environment	1	Air quality	3
	2	Water quality	2
	3	Soil quality	0
	4	Biodiversity	0
	5	Water use	1
	6	Energy use	2
	7	Land use	3
	8	Material use	1
	9	Climate change mitigation	0
	10	Climate change adaptation	1
Economic	11	Economic returns for investor	2
	12	Economic growth	2
	13	Employment	0
	14	Economic inclusion	3
Social	15	Public health	3
	16	Access to basic services (public transport, energy, water, solid waste collection, green spaces)	1
	17	Safety	2
	18	Gender equality	0
	19	Green behaviour and awareness	1
	20	Community involvement	3

Note: the full list of filters is provided in this Table. However, in practice the table should be shorter, as a result of the selection of filters to match green city challenges identified during Step 1.3.

Figure: 4



Derive budget implications. Impacts on the City's annual expenditure and capital expenditure (capex) budgets should be estimated and presented in the Green City Action Plan for each selected measure separately. This will help to further prioritise selected green city measures according to their cost. In addition, benefits and savings should be estimated to provide a comprehensive picture and allow for a thorough political consideration of the plan's actions. These estimates will be quite relevant for the forthcoming Council debate with a view to understand budget implications associated to the Green City Action Plan in a short, medium and long-term perspective. Both the annual budget costs and capex estimates presented in this step are indicative only. They do not lead to a compulsory investment plan. More concrete and reliable cost calculations will be refined as part of the in-depth project implementation plan in the next phase: Green City Action.

Based on international experience, the following estimates are commonly provided in Draft Green City Action Plans:

- Estimated annual implementation and capital expenditure costs per measure
- Estimated annual savings and (economic) benefits per measure
- Total estimated annual budget cost for the Green City Action Plan including all measures across the environmental dimensions spread across entire duration and per year
- Total estimated savings and (economic) benefits for the Green City Action Plan
- Estimated cost of pre-investment (for research, feasibility and impact studies, etc.)
- Considerations regarding spread of financing across any combination of local and national government, multilateral agencies, public-private partnerships, development organisations, other private (financial) sector investments, as well as financing models.

In most cases budgetary resources are needed to effectively implement a project and monitor developments (to cover the costs of human resources, capital investment, etc.). Not all measures require huge upfront capital investment, but many will deliver cost savings over time but only after initial costs. A wide variety of funding sources, innovations and ideas will have to be explored to successfully implement the wide range of actions identified in the Green City Action Plan. External grant or donor funding may be available for specific projects. Private sector partners may be interested in specific projects with financial return on investment or with return in terms of protection of their key assets.

6.2 Stakeholder-based prioritisation of green city actions

The green city *actions* identified as a result of the technical analysis within the city administration should be checked and complemented through additional stakeholder consultation. External experts and citizens representatives will confirm or dispute the relevance of identified green city policies. This can be done in a larger group that involves a broader range of stakeholders, gathered in a workshop. Public opinion is particularly important, as it is likely to be followed by city leaders, and should therefore not be neglected. In addition, undertaking policy which is favourably viewed by citizens is likely to be more easily implemented. This step is different from the stakeholder-based prioritisation of green city challenges (cf. Step 1.3.2) in the sense that it aims to prioritise green city actions, and not challenges.

6.3 Final prioritisation: political assessment of green city actions

This is a formal assessment of the policies selected for the Green City Action Plan Political. Political assessment could help to select some policy options which meet the political agenda of the city, the national government or the international community (climate change). This step would help to ensure final leadership from the Mayor and Council.

7. METHODOLOGY FOR DEVELOPING GREEN CITY ACTION PLANS

7.1 The structure of Green City Action Plans

The Green City Action Plan (GCAP) presents the findings of all above-mentioned activities and defines the long-term Green City vision and strategic objectives for each priority area. It is structured according to affected environmental dimensions and significant aspects, using indicators and time-related targets and measures for the Council's operations related to the environmental dimensions. The GCAP also outlines the scope of actions, the targets set and the major actions developed, and the initial steps of implementing the Plan for a period of 1-3 years. It is an overarching strategic document which contains the guiding principles offering orientation for the Council's decision-making and the administration's implementation work in the mid-term, i.e. within 3-5 years. **Table 9** provides an overview of the contents of contents of a GCAP.

Table 9. Structure and contents of Green City Action Plans

Sections	Content

Messages / presentation	• Foreword /messages to present Green City Plan on behalf of the Mayor
About the plan	• Background of the plan • 'How to read'
Work team	• Authors of the plan • Coordination team • Contributors to the process (according to the different stakeholder groups)
Summary	• Green City Baseline • Development forecast or scenario • Key programmes and strategic objectives • Priority Challenges and Actions
Green City Action Plan Methodology	• Basic concept • Phases • Key activities • Primary outcomes
Green City Baseline	• City Profile • Activities / studies implemented in the Green City Baseline • Environmental Challenges / Analysis of indicators (PSR) (benchmarks) • Socio-economic impacts • Priority areas/challenges for action
Green City Action Plan	• Strategic objectives & Key programmes • Key measures to address environmental challenges • Future targets • Timelines • Responsibilities • Investment needs: Pre-investment and long-term financing
Green City Monitoring, Verification & Reporting	• Description of MRV and benchmarking • Aspects of Reporting • Citizen engagement
Conclusions	• Main findings • Next steps and timelines

7.2 The contents of the main sections of Green City Action Plans

The critical aspects of the Green City Action Plan, and how they will be integrated in the complete methodology, are listed in **Table 10**. The main aspects to be envisaged for the GCAP were initially suggested by EBRD, and also discussed during a workshop with OECD and ICLEI. This will help to understand how broad objectives of GCAP are implemented and can be identified.

Table 10. Translation of the main aspects of Green City Action Plans into the methodology

Main aspects of the GCAP		Implementation in the GCAP methodology
GCAPs will be strategic planning documents that balance high-level aspirations with pragmatic actions and investment priorities for cities; **The method will integrate a short-term, medium-term and long-term perspective in the action plan;**	✓	Step 1.3-2.3: Implemented by introducing a prioritisation process and both strategic objectives for key programmes and medium- to short-term operational targets for key actions applying specific timelines: • strategic objectives (10-15 years) • mid-term targets (ca. 5 years) • short-term operational targets (1-3 years)
GCAPs could be complemented by sector- focused plans and build on existing multi-sector environmental programmes where such exist that define and analyse in greater detail the investments required to achieve the vision set out in the GCAP. Note that the Consultant is not required to work on the method or content of these more detailed sector plans;	✓	Step 2.3: The Green City Action plan triggers or links to sectoral-focus action plans for different sectors, which define short-term operational targets and suitable measures that serve as stepping stones to reach the medium targets and long-term objectives.
This method for developing GCAPs will be able to be applied to any city in the EBRD COOs;	✓	The suggested GCAP methodology and the environmental dimensions and indicators selected involving EBRD experiences will allow to be used by any city. The process applied would be in line with requirements of international standards such as ISO 37101 on Sustainable Development in Communities. However, then, further dimensions would need to be considered.
This method for developing GCAPs will be written in a way that will provide guidance to city officials and their advisers on how to develop a GCAP;	✓	A mostly visual guidance is being introduced allowing to easily grasp the methodology.
The method to develop GCAPs will advise on how to include civil society, businesses and government officials and all relevant stakeholders;	✓	Starting with step 1.1, involvement of stakeholders in horizontal and vertical manners is made an essential and ongoing activity in the methodology.
The method will also define the institutional/policy framework relevant for a well-structured GCAP approach;	✓	The method is based on experiences in applying policy and management cycles in city administrations.
The method to develop GCAPs will outline a menu of relevant indicators and data requirements that a city can draw on to measure GCAP progress;	✓	The environmental dimensions and indicators have been selected involving EBRD, OECD and ICLEI experiences. Focus is on environmental indicators applying a (widely known and applied) Pressure – State – Response approach.

The method will adopt a cycle approach of green city action planning instead of a linear approach (Figure 5).	✓	The methodology adopts a cyclic and integrated approach based on policy and management cycle knowledge. The process applied would be in line with requirements of international standards such as ISO 14001 (on Environmental Management) or 37101 (on Sustainable Development in Communities). However, then, further dimensions and indicators may need consideration. Figure 5 below illustrates the cyclical process of GCAPs.

Figure 5. Green cities' environmental dimensions and the cyclical process of Green City Action Plans

The proposed Green City Action Plan methodology is summarized in **Table 11** and **Figure 5**. The GCAP methodology is based on work previously implemented by ICLEI together with numerous partners in different contexts, supplement by consideration of the IADB's ESCI methodology.

Table 11. Summary of the methodology for developing Green City Action Plans

Step	Sub-step	Short description
Step 1 Green City Baseline Key question of step 1: - What is the current state of the environment? Aim: - The "Green City Baseline" aims to inform policy and strategic decision-making at the start of the process (or the review phase for advanced local governments) and provide the reference scenario for the business-as-usual against the Green City approach and action. Primary outcomes: - Commitment to Green City development for the local community. Process initiated within local government and community. - Overview of status quo (understanding situation, constraints and capabilities). - Priorities identified to address environmental challenges most effectively and in an		

integrated manner.

Indicative timeline:

- 1st (introductory) GCAP cycle: 6 months

Following (regular) GCAP cycles: 1-3 months
Secure initial commitment - agreement with the Council
Identify & engage stakeholder group(s)

Map local situation (preparation phase in the prioritisation)	Map external framework conditions – including financial status , governance and management inventory and analysis Map environmental and infrastructure challenges Set up team & institutional structures Map local policy framework (collection and assessment of response indicators)
Assess & prioritise (green city *challenges* prioritisation process)	Conduct technical analysis Stakeholder-based prioritisation Political assessment & Green City Baseline

Step 2 Green City Action Plan

- The "Green City Action Plan" compiles and presents the agreed development vision and objectives for a period of 10-15 years, the priorities to work upon in a period of 3-5 years, and the scope of actions and targets for priority programmes and actions proposed.

Primary outcomes:

- Strategic objectives outlined according to environmental and socio-economic dimensions
- Policy options assessed for addressing environmental challenges
- Priority programmes and key actions defined
- Medium-term targets for Green City Actions determined
- Draft Green City Action Plan compiled Indicative timeline:
- 1st (introductory) GCAP cycle: 6 months
- Following (regular) GCAP cycles: 3 months
- Develop a vision (10-15 years)
- Develop strategic objectives for priority areas
- Determine key programmes within the priority areas
- Consider scope incl. territory and stakeholders
- Technical analysis (review existing green city response; select new green city policy options; prioritisation of selected green city policy options; derive budget implications)
- Stakeholder-based prioritisation of green city policy options

Step 3 Green City Implementation

The "Green City Implementation" will operationalise the Green City Action Plan, break it down into concrete tasks, allocate budget, time and staff, and monitor the contribution of each measure to the objectives and targets established in the Plan. This will include building political support for the Plan's targets and actions by linking to municipal budget resources and reaching out to key government members.

Primary outcomes:

- Initiating and running projects as part of a comprehensive Green City Action Plan.
- Monitoring of implementation of actions and progress towards objectives and targets.
- Political Commitment to Green City Action Plan.
- Mitigation of environmental challenges and risks / environmental improvements started.

- Consideration of financial resources in municipal budget.
- Established implementation partnerships. Indicative timeline: 12 - 36 months

Step 4 Green City Reporting

The “Green City Report” will analyse successes and failures during the implementation period, provide the basis for taking further political decisions and inform Council, stakeholders & the public on what the city has done and achieved

Primary outcomes:

- Institutionalized evaluation, audit and reporting system in use.
- Green City Report reflecting achievements based on objectives and targets established in the Green City Action Plan.
- On-going and increasing environmental improvements.
- New policy options identified to accelerate Green City development. Indicative timeline:
- Suggested to implement as annual report, i.e. 12 months from Council decision

Duration of phase ca. 3 months
Evaluate effectiveness of process
Evaluate process and achievements
Implement audit & Report results & Green City Benchmarking
Evaluate effectiveness of measures/investments to address environmental challenges and risks
Implement internal audit and Implement external audit as well as Audit response action
Draft Green City report
Present Green City report
Draw conclusions and prepare for subsequent cycle

Figure 6: Indicative timelines for developing Green City Action Plans

Table 11 summarizes the indicative timelines provided in existing green cities action plan methodologies (Aalborg Commitments, ESCI, ADB, 100 Resilient Cities, eco-BUDGET, Integrated Management Systems). **Table 12** indicates the timelines for each of the four sections of the Green City Action Plan. As can be seen, the EBRD GCAP process timeline is consistent with other approaches.

Table: 12

1st stage: Preparation (5 %), Prioritisation (5%), Action Plan (30 %)	12 months
2nd stage: Pre-investment (50 %), Monitoring (10%), Action Plan	36-48 months
100 Resilient Cities	
Overall timeline	Not specified
Preliminary resilience assessment Strategy Initiation (1 month), Stakeholder Engagement Plan (1 month), City Context & Preliminary Resilience Assessment (3 months), Focus Areas and Custom City Approach (1 month)	3 months
Resilience Strategy: priorities and initiatives Phase II Initiation (1 month), Focus Area Analysis & Diagnostic (3 months), Opportunity Assessment (2 months), City Resilience	6-9 months
Implementation and evaluation	Not specified
***eco*BUDGET**	
Overall timeline	annual (first cycle 16 – 24 months)
initial set-up and diagnosis draft ecoBudget implementation evaluation	4 months 2 months 12 months 2 months
Integrated Management System	
Overall timeline	Annual (first cycle 18-25 months)

Baseline	3 months
Review Target	3 months
Setting	2 months
Commitment	12 months
Implementation & Monitoring Evaluation & Reporting	2 months

7.3 Range of skill sets, both within a city administration and external support, required to develop GCAPs

A Green City Action Plan management needs to allow for maintenance of the system, communication with all relevant actors and support for political strategy and decision-making. The local administration is seen as the only body able to promise all three aspects. The strategic approach suggests a central position for this co-ordination function. Success of the approach is best supported by a city administration that perceives itself to be a 'learning administration' and a partner to other stakeholders involved in the process. The city administration is considered the 'engine' of the process. To efficiently implement the rather complex dimensions, a capable, efficient and motivated administration is key, even more so under condition of budgets constraints. It will be important for the city administration to be prepared for continual change and adopt requirements from societal transition.

- A cross-cutting, integrated organisation structure and management;
- Management style is cooperative and staff oriented with clear objectives in all departments. Superiors are positive examples with regard to engagement, creativity and motivation
- Employees are encouraged and motivated and are given room for their own initiatives and decisions. They feel in line with their tasks and do not feel overburdened or unchallenged
- Employees feel identified with "their" administration (corporate identity)
- Horizontal and vertical interconnectedness of relevant actors;
- Transparency and active information policy towards the public (good service for the customer is more important than to fulfil bureaucratic rules)
- Communication is clear and transparent and does not depend on hierarchies. Oral communication is as important as written documentation
- Topical and financial integration of financing programmes;
- District-level representatives and contact points;
- Qualitative analysis of framework conditions;

- Regular and objective control of results and objectives approved allows to react on time in the case of variations, and to face new pressures and challenges

- Changes emerging from these assessments must be communicated in order to

avoid misunderstandings

- Respectful feed-back and contacts with civil stakeholders engaged.

7.4 Coordinating the effort

It is important that the City establishes an effective coordination structure to oversee the GCAP development. The GCAP is necessarily comprehensive, and as such crosses many departmental interests. In response to this, it is important that the coordination structure is inclusive and cross-departmental. International experience suggests that two groups are important in this regard: coordination board and coordination team.

7.4.1 Co-ordination Board

The Co-ordination Board is responsible for supervising the whole Green City Action Plan. Ideally, it is a group of about 10-15 high-level local government politicians and managers. However, the number depends on the size of the administration and it is gradually expanding together with expanding scope and contents of the system. Participation in the Co-ordination Board should follow a cross- departmental approach comprising representatives from all departments relevant for resource management be it natural, human or financial resources. Participants could represent departments responsible for the different sectors addressed, e.g. mobility, public works, energy supply, culture and social issues, etc., but in a case, the financial department. Additionally, representatives of relevant local authority services (municipal companies) and stakeholder groups should be involved.

7.4.2 Co-ordination (Team)

The Co-ordination (Team) should be established centrally in the City administration for the operational activities. Often this is best situated within the Mayor's Office. Furthermore, it is advisable that a separate entity be responsible for drawing up and implementing the Green City Action Plan. This separate entity may be an existing department or a department or office specially created for the task. The Co-ordination Team is likely to consist of a few persons according to volume of the objectives to be managed and the size of the city. The head of the team is the Green City Coordinator, who will need to comply with particular demands and skills as follows:

- A change agent, that can rally resources, support, and buy-in for innovative work while working in an environment where resources are scarce, where they may be starting with almost nothing (100 Resilient cities)

- Capable to bridge between policy and implementation and able to build partnerships and alliances of diverse stakeholders able to resolve conflicts;
- A strategic, innovative, cooperative and collaborative personality and 'good listener';
- Excellent manager with good overview and coordination skills;
- Powerful 'driver' able to set clear goals and persevere;
- An excellent communicator and inspirational ambassador;
- An excellent facilitator of activities between different stakeholder groups able to organise and implement inspiring events

Brings together a wide array of stakeholders to learn about the city's challenges and help build support for individual initiatives, and for resilience building in general. These stakeholders include government officials, and it is critical that representatives from the private sector, non-profits, and civil society are also included. Leads the resilience strategy, a six-to-nine-month process during which the CRO brings in a wide variety of stakeholders, to help identify the city's resilience challenges, its capabilities and plans to address them, and then to identify the gaps between these two. At the end of this process, the CRO will have a series of resilience-building initiatives that he or she will then work to put in to action, with assistance from 100RC and our platform partners.

At the same time, the CRO acts as the "resilience point person," ensuring that the city applies a resilience lens so that resources are leveraged holistically and projects planned for synergy. This lets the city get the most "bang for its buck" on its projects, potentially achieving multiple resilience goals with one project. This could include, for example, a flood barrier also serves as a bike path, promoting healthy citizens and cohesive communities. Effective CROs perform all these functions, helping their cities manage their own complexities to make resilience efforts more impactful, and collaborating externally to identify and integrate lessons other cities have learned, so solutions scale globally.

7.4.3 Internal Auditor

The internal auditor needs to be a person with profound knowledge regarding structure and competences of a local authority and independent from the coordination team. This person could come from the Strategic Department of the local authority, from a regional authority or from another city (Peer to Peer Review). Within an annual procedure, the internal auditor evaluates the Green City Plan management process and achievements as the basis for a subsequent cycle.

7.4.4 External Auditor

If the city decides that it wishes to have an ISO 14001 or ISO 37101 certification and/or EMAS registration, an external auditor performs an audit of the system according to the resp. requirements.

7.4.5 Capacity Building and Motivation

The expertise of every employee is of great importance for a successful Green City Action Plan management. The employees' level of competency should be continually improved, in particular through training courses as a complement to their job-related education and job experience. For this reason, careful and targeted personnel and organisational development incl. education, level of awareness and competency are important fields for the implementation and success of the Green City Action Plan. Key to this is the motivation of staff members. Improving their understanding of the problems to be solved increases their motivation and the level of participation. Also, along with training courses for job-related topics, employees should regularly receive information about sustainability management and its progress in the organisation. A coherent approach to personnel and organisational development would apply instruments such as:

- Personnel management and supervision (including related evaluation mechanism, and "leading by objectives";
- Personnel development (incl. targeted facilitation of performance and learning capacities of staff);
- Increased targeted training and professional education;
- Staff maintenance programmes;
- Recruitment and selection strategies to ensure job profile and skills match;
- Controlling of personnel costs;
- Continual organisational improvement process;
- Change management approach with internal facilitation capacity;
- Professional project management;
- Benchmarking and structural comparison with peer cities.

7.5 Definition of Gjirokastra Green City Indicators

Topic	Indicator	Unit	Definition / Description
Air	Average annual concentration of PM2.5 Average annual concentration of PM10 Average daily concentration of SO2	µg/m3	Particulate matter in suspension, with a diameter lower than 2.5µm, annual average. The data should be collected twice a month through sensors in multiple locations of the city, and averaged. The locations should reflect the diversity of urban areas (residential, roadside, industrial zones, parks etc.) Particulate matter in suspension, with a diameter lower than 10µm, annual average. The data should be collected twice a month through sensors in multiple locations of the city, and averaged. The locations should reflect the diversity of urban areas

	Average annual concentration of NO_2		(residential, roadside, industrial zones, parks) Sulphur dioxide in suspension 24-hour average. The data should be collected twice a month through sensors in multiple locations of the city, and averaged. The locations should reflect the diversity of urban areas (residential, roadside, industrial zones, parks etc.) Nitrogen dioxide in suspension, annual average. The data should be collected twice a month through sensors in multiple locations of the city, and averaged. The locations should reflect the diversity of urban areas (residential, roadside, industrial zones, parks etc.)
Water	Biochemical Oxygen Demand (BOD) in rivers and lakes Ammonium (NH_4) concentration in rivers and lakes	mg/L	BOD shows how much dissolved oxygen is needed for the decomposition of organic matter present in water. The data should be collected in several locations of each river / lake, twice a month. Ammonium concentrations are normally raised as a result of organic pollution, caused by discharges from waste water treatment plants, industrial effluents and agricultural runoff. The data should be collected in several locations of each river
Drinking water	Percentage of water samples in a year that comply with national potable water quality standards Number of contaminated sites	%	The data should be collected in several locations the water supply network. Ideally the quality of water should be frequently measured to avoid health hazards (once a week) The term **'contaminated site'** (CS) refers to a well-defined area where the presence of soil contamination has been confirmed and this presents a potential risk to humans, water, ecosystems or other receptors. Risk management measures, e.g. remediation, may be needed depending on the severity of the risk of adverse impacts to receptors under the current or planned use of the site. Sensitive areas, such as industrial zones and solid waste disposal sites, should be covered. Concentration of (a) mercury, (b) cadmium and (c) zinc in soil. Other heavy metals that could be measured include chromium, arsenic, lead, copper and nickel. The data should be collected in multiple locations of the city, twice a month. Sensitive areas,

			such as industrial zones and solid waste disposal sites, should be covered. Benchmarks follow standards set by the Dutch Ministry of Housing, Spatial Planning and the Environment.
Soil	Concentration of heavy metals (Pb) in soil	mg/kg	The data should be collected in multiple locations of the city, twice a month. Sensitive areas, such as industrial zones should be covered. Benchmarks follow standards set by the Dutch Ministry of Housing, Spatial Planning and the Environment.
	Open green space area ratio per 100000 inhabitant	Hectares	Hectares of permanent green space per 100,000 city residents. The data should be compiled bi-annually.
	Share of non-built-up areas within urban limits	%	This indicator measures the amount of green, blue and vacant land within urban limits. The data should be compiled bi-annually.
BIODIVERSITY AND	Abundance of bird species	Annual % of change	This indicator measures the percentage of change in bird population in one year. The data for the whole city can be estimated from a sample of an inventory of bird population in a

7.6 Response Indicators for Gjirokastra

Topic	Indicator	Examples of response
TRANSPORT	High-polluting vehicles are regulated / Energy-efficient vehicles are incentivised through fiscal instruments Extension and improvement of public and non- motorised transport is planned and supported through investment in place	- Interdiction of circulation and fines for high-emitting vehicles - Subsidies to replace vehicles older than 2000 or diesel-powered vehicles - Fuel standards (EURO 6, EURO 5) - Sustainable Transport Development Plan
	Public and non-motorised transport is promoted through Information and awareness campaigns	- Car-free days - Congestion charges - Smart automated traffic regulation Parking management
	Traffic demand is managed (congestion charges, smart technologies)	
	Public transport emergency management (in publicly and/or privately run networks) is planned and tested	- Transport resilience action plan - Tests for road transport evacuation Tests on efficiency of emergency transport systems
BUILDINGS	Green building is promoted through standards and fiscal incentives. Public and private investment in energy efficiency in buildings	- Public and private investment in retrofitting

	Metering and billing for personal energy use is regulated	- Billing based on actual consumption - Smart metering technologies in households
	Energy efficient industrial machinery is regulated and incentivised through fiscal instruments (electricity, heat, industrial processes)	
INDUSTRIES	Energy efficient industrial technologies (electricity, heat, industrial processes) is supported through private investment	- Penalties for high-emitting industrial technologies Subsidies for the purchase of energy efficient industrial technologies
	Material efficiency of new built industrial facilities and waste recycling is regulated and incentivised through fiscal instruments	- Penalties for low recycling rate of industrial waste - Subsidies for material efficient technologies and recycling facilities Mandatory recycling rates
ENERGY	Industrial wastewater treatment / reuse / recycle is promoted through regulations and fiscal incentives	- Energy (Electricity / Heating) Master Plan
	Coverage and quality of electricity and heat supply is improved through investment Renewable energy facilities in private buildings are incentivised through fiscal instruments	- Subsidies for the development of solar panels on rooftops Subsidies for the development of solar water heaters
	Renewable energy technologies are developed and supported through public and private investment Renewable energy facilities are incentivised through awareness campaigns	- Renewable energy education programmes in schools Renewable energy facilities are incentivised through awareness - Energy resilience action plan Smart technologies to detect power breakdown
	The resilience of electricity networks in case of disaster is tested and enhanced through investment	- Billing based on actual consumption - Smart metering technologies in households
WATER (SUPPLY, SANITATION, DRAINAGE)	Metering and billing for water use is regulated	- Water saving / reuse is encouraged through awareness campaigns - Water saving education programmes schools - Coverage and efficiency of water supply networks is improved through plans and investment
	- Water Master Plan	- Buildings' access to wastewater collection and treatment systems is improved through plans and investment

	Investment to provide more continuous water supply in households	- Investment to equip buildings with individual or communal grey and - Investment to connect buildings to wastewater treatment plants - Construction of new wastewater treatment facilities
	Wastewater treatment is promoted through regulations and fiscal incentives	- Mandatory wastewater collection facilities for new buildings -
	Wastewater billing is regulated Drinking water pre-treatment is enhanced through plans and investment	- Wastewater collected is charged to households - Construction / upgrading of drinking water treatment facilities
	Drainage facilities are developed through plans and investment Business and community resilience is encouraged through awareness campaigns	- Resilience Master Plan - Construction of drainage tunnels - Construction of dykes - Construction of retention ponds - Information on business continuity plans on the City Hall's website earthquakes etc.) in schools
LAND-USE	Transit-Oriented Development is promoted	- Density targets - Incentives for higher densities (e.g. Floor-Area-Ratio bonus)
	TOD is promoted in Transport and Land-Use Master Plans	- Higher density regulations near public transport lines - Higher density regulations near public transport lines
	Mixed-use development is promoted through zoning regulations / incentive	- Zoning regulations promote mixed-use development - Fiscal incentives for mixed-use development for developers
		-

8. LEGISLATIVE FRAMEWORK FOR THE IMPLEMENTATION OF GJIROKASTRA GREEN CITY PLAN

One of the important preconditions of a successful implementation of the energy efficiency Action Plan is its complete harmonization with the relevant municipal, national and EUI legislation. The key related elements of those are outlined as follow.

8.1 Relevant regulations and documents of the European Union

The Directives of the European Union which directly or indirectly regulate the field of energy

efficiency are:

- Directive 2006/32/EC on energy end-use efficiency and energy services, June 2006;
- Directive 2009/125 on setting the ecodesign requirements for energy-related products, July 2009
- Directive 2010/30 on the indication by labeling and standard product information of the consumption of energy and other resources by energy-related products, October 2010;
- Directive 2010/31 on the energy performance of buildings, November 2010;
- Directive 2012/27 on energy efficiency amending directives 2009/125 and 2010/30 and repealing directives 2004/8 and 2006/32, October 2012.

Main legislative documents which regulate the development of energy sector on the level of European Union (lined up chronologically) are:

- White Paper on an Energy Policy for the European Union, January 1996;
- Energy for the Future: Renewable Sources of Energy, White Paper for a Community Strategy and Action, November 1997;
- Green Paper „Towards a European Strategy for the Security of Energy Supply“;
- Green Paper on Energy Efficiency or Doing More with Less, June 2005;
- Green Paper on an European Strategy for Sustainable, Competitive and Secure Energy Supply, March 2006;
- Action Plan for Energy Efficiency: Realizing the potential - Saving 20% by 2020, October 2006;
- The proposal for European Energy Policy, January 2007;
- The proposal for EU energy efficiency plan, year 2011.

The Republic of Albania has also confirmed the Energy Charter and Protocol with:

- Law Nr. 8261 dt. 11.12.1997. for the ratification of the Energy Charter Treaty and the Energy Charter Protocol on Energy Efficiency and aspects of the environment;
- Law Nr.9560 dt.12.06.2006 on the Confirmation of Amendments of Commercial Provisions of the Contract on Energy Charter.

The Directives of European Union which regulate the field of renewable sources of energy use are:

- Directive 2001/77/EC on the promotion of the electricity produced from renewable energy source in the international electricity market, September 2001;
- Communication on Alternative fuels for Road Transportation and on a Set of Measures to Promote the Use of Bio fuels, November 2001;
- Directive 2003/30/EC on Promotion of the Use of Bio fuels for Transport, May 2003;

Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, 23rd April 2009.

Four basic targets of the European energy policy by 2020 are:

- decrease of greenhouse gases emission from the developed countries for 20%;
- increase of energy efficiency for 20%;
- increase of the share of renewable sources of energy to 20%;
- increase of the share of biofuels in traffic to 10%.

8.2 Legislative framework and regulations of the Republic of Albania

The most important energy policy documents are:

- First, Second and Third Energy Efficiency Action Plans
- The Energy Community Treaty for South East Europe, which was signed on October 25, 2005. The Treaty aims at creating a regionally integrated energy market for electricity and natural gas, as part of the wider EU market.
- Energy Efficiency Law
- The National Strategy of Energy which represent the basic policy document for the development of the Albanian energy sector;

8.2.1 Energy Efficiency Law

9. Article 24 of the Law on Energy Efficiency also allows for financing from the Energy Efficiency Fund to be directed to programs that deliver awareness campaigns and education activities regarding energy efficiency.
10. Energy labelling is recognized as a cornerstone for enhancing consumer information of energy efficiency. Albania has adopted the “Law on Information of the Consumption of Energy and Other Resources by Energy-Related Products” (Law 68/2012) which transposes Directive 2010/30/EU on energy labelling.

However, the Energy Efficiency Law has not yet been enforced and it is very important to be point out that with the required secondary legislation has not yet being approved and implemented. The main barriers for implementation are the following:

- The goal and objective did not touch public relations, implementation of state policy on promotion of energy efficiency and services offered for its implementation;
- State functions on promotion of energy efficiency that were not clearly defined and that were vague on their duties;
- Uncertainties in the duties of responsible institutions on implementation of the Law on Energy Efficiency;
- National Strategy on Energy Efficiency and relevant action plans were expressed in general terms, without concrete definitions;
- The Law on Energy Efficiency’s is limited to industrial consumers and does not residential and public consumers;
- Activities and measures for promotion of energy efficiency have not been defined;
- No platform for recording EE/RES projects has been approved (Open Regional Fund of GIZ has prepared it) and not clear definitions on securing and gathering information and technical data needed for energy efficiency projects;
- Limited activity and not good organization of the energy auditing process.

The adoption of the Energy Efficiency Law provides the foundation upon which to implement actions once the necessary secondary legislation has been developed. An important principle of the national energy efficiency policy as defined in Article 5 of the Energy Efficiency Law is the education and awareness raising of the general public and end users about the benefits from reducing inefficient energy consumption. Article 15 regulates information and training. It requires the new Agency for Energy Efficiency to:

- Publish on its official internet page information on mechanisms, publications, financial and legal frameworks which may assist in achieving energy savings
- Inform consumers of the different methods and practices to achieve energy savings
- Provide training for government institutions and local authorities

8.2.2. Law on conservation of thermal energy in buildings

Based on this law, the Council of Ministers sets norms, rules and designing and construction conditions, heat generation and conservation in buildings included in the energetic building code. The design and construction of new buildings shall take into account energy conservation and its efficient use and the total thermal losses expressed though volumetric thermal losses coefficient of the respective building (Gvt - W/m^3 K – please read more about this in the following session) should be lower than normative volumetric coefficient of thermal losses (W/m3K) and in new buildings shall be included also thermal installation of central or district heating systems (in order to minimize electrical heating, which is huge problem for Albanian Power System).

Law No. 8937, dated 12.09.2002 “On Conservation of Thermal Heat in Buildings” established the necessary legal basis for setting up the rules and making mandatory actions for conservation of thermal heating in buildings. Article 3 of this law stipulates that the design and construction of buildings should meet the necessary technical parameters for conservation, saving and efficient use of energy in building stock of Albania. The main purpose of this law is to establish the norms and rules for reducing reduce heat losses in buildings.

8.2.3. Energetic building code

The existing Building Code does not have a good implementation and Ministry of Energy and Industry assisted from EBRD has prepared the final Draft of Energy Performance in Building Law ready for approval by the Albanian Parliament.

This Code contains different provisions as to calculation of heat losses from the walls of a building using a given formula, which take into account the temperature inside and outside a building located in a specific area of Albania. The Code introduces the concept of the normative volumetric coefficient of thermal losses (Gvt), which represents thermal energy losses from transmission referred to the unit of heated space and the difference of 1º K between the inside and outside temperatures. This Code divides Albania into three climacteric zones based on degree-days for each

zones (division according to the following third map given below). The Code requires that for each zone, the buildings should meet a normative volumetric coefficient of thermal losses (Gvt) equal or lower than a fixed figure given in the code.

On January 16, 2003 the Government by the Decree No. 38 approved the Energy Building Code, which contains norms, rules and conditions of designing, construction, production and conservation of thermal energy in buildings. The approval of this code was based on the Law No. 8937, dated 12.09.2002 "For Conservation of Thermal Heat in Buildings". According to the Decree, the physical or juridical persons dealing with designing of buildings, either private or public, shall observe these norms, rules and conditions.

8.2.4. National Energy Efficiency Action Plan (NEEAP)

With respect to climate change, Albania has submitted its Intended Nationally Determined Contribution (INDC) which forms part of the United Nations Framework Convention on Climate Change (UNFCCC) process for setting and meeting emissions reduction targets at the international level. Albania has set itself a target of 11.5% reduction in CO2 emissions by 2030 against a forecasted baseline emission trajectory.

The draft Strategy of Energy of Albania sets the following targets which primary focus on the power generation and consumption sector:

- Reduction of energy intensity by 12.5% by 2020 against 2012 levels;
- Increase hydropower supply to 7,300 GWh/annum by 2020 (from 4,425 GWh in 2012);
- Reduction of energy dependency on imports to 65% in 2020 from 69.1% in 2012;
- Achieving a 38% target in the use of renewable energy as a fraction of total final energy consumption, compared to a level of 31.2% in 2009;
- Reduction of electricity losses in the distribution network to 14% by 2017;
- Increase cash collections from electricity sales to 93% by 2020;
- Strengthen interconnection of electricity grids with Kosovo and integrate into the ENTSO-e network;
- Align the electricity sector's legal and regulatory framework with the EU Acquis and satisfy obligations of the Third Package of the internal energy market of the EU.

Albania's first NEEAP was developed in 2009 by decision of the Ministerial Council of the Energy Community to comply with the transposition of the European Union (EU) Directive 2006/32/EC (the Energy Services Directive). The NEEAP was adopted by the Government of Albania in September 2011 and envisages annual

energy savings of 3% in 203 and 9% in 2018, calculated as a proportion of the average final energy consumption of the five-year period 2004–2008 inclusive.

8.3. MUNICIPAL FRAMEWORK

8.3.1. Relevant acts and documents of the municipality of Gjirokastra

- Office design (plus terms of reference) on the General Regulatory Plan for the City of Gjirokastra 2007
- Strategy and action Plan for the Tourism in Gjirokastra 2011-2012
- General Local Plan 2012
- New General Local Plan according to the new territory division (foreseen deadline December 2016)
- Strategy of Urban Development will be ready on middle of the year 2017
- Regulatory Plan of Gjirokastra (map year 1983)

8.3.2. Budget of the Municipality

Through law, Gjirokastra Municipality is empowered with the authority to independently obtain revenue to finance the exclusive functions under their jurisdiction. The budget allocation and spending is according to the decision of the Municipality's council.

Gjirokastra Municipality, on conformity with the Law on Local Government, ensures the financing from the following sources:

- Local taxes and levies on the economic activity of small businesses and on hotel residency, restaurants, bars and other services;
- Local taxes and levies on the personal income derived from donations, inheritances, testaments, and from local lotteries; and
- Other taxes and levies provided by law.
- Local taxes and levies on movable and immovable property, as well as on the transactions conducted on them;

The central government provides funds to the Municipality to meet the requirements for the provision of shared and delegated functions. The law on the Local Government Tax System defines the tax base as well as the minimum and/or maximum rates. For local taxes, local government can modify the tax base by +/- 30% of the tax rate by a decision of the local council. Communes and municipalities have the right to decide whether or not to apply a local tax. In case Gjirokastra Municipality decide to apply the tax, they choose the tax rate, as well

[3] While the declared intermediate target is 3%, a lower target of 26 ktoe (approximately 1.4% of the reference quantity) is indicated in Table 5 of Page 14 of the 1st NEEAP, to reflect a realistic goal at the time of adoption.

as the manner for collection and administration within the limits and criteria set forth in the respective law.

In addition to revenues with a fiscal nature, the Municipality can generate revenues from the economic activities, rents, and sale of property and from donations, interest income and penalties.

The Law on Local Government Borrowing No. 9869, dated February 4, 2008, allows the local government to borrow:

- For cash flow and investment purposes,
- From the capital market—financial institutions and banks, and
- On the domestic and international markets.

The loan maturity can be both short and long.

Short-term loans can be issued for:

- Maturity shorter than one budgetary year; and
- To finance temporary cash flow deficits, when operational expenditures are higher than revenues.

The request for a short-term loan should be first sent to the Ministry of Finance (MoF). If the MoF declines the request; the mayor may borrow directly from banks only if the following condition is fulfilled: Short-term debt shall not at any one time exceed 10 percent (10%) of total actual revenues of the local government from local taxes and fees and shared taxes of the previous fiscal year.

The Local government also derives revenues from local fees for:

- Public services provided by the local government;
- The right to use municipal public property; and
- The issuance of licenses, permits, authorizations and issuance of other documentation, at the discretion of local government.

Long-term loans can be issued and used for:

- Investment for public purposes; and

- Covering local functions—own, shared (and delegated if necessary).

The debt maturity must not be longer than the useful time of investment. The long-term debt is negotiated by the mayor (his staff) but the final decision is made by the local council. Annual outstanding debt service must not exceed:

- 20% of unconditional revenues (including owns source revenue, shared taxes, and unconditional grants) in previous three fiscal years; and
- 7.1 % of operational surplus (ratio between net gross income and outstanding debt should be 1.4).

Outstanding Debt (cumulative) must not be higher than 130% of unconditional revenues.

8.3.3. Approved target programs for the development of infrastructure in Gjirokastra

The recent municipal infrastructure investment plan is approved for the next 15 years and comprises[4]:

- Construction of 1 new school, Retrofit of all schools
- Transport: city road bypass, rural connection
- Tourist: 2nd license for new tour operator
- Fixing public spaces: parks, playground
- Waste water treatment plan

The following projects are detailed on the strategy of the territory development of Gjirokastra:

- The project of the bypass North ring;
- Rehabilitation of almost administrative public buildings of all Gjirokastra's villages as well as all Administrative Units (within the Gjirokastra city);
- Reconstruction of urban areas on "Murat Çelebiu" quarter;
- Reconstruction of the facades for the buildings at city entrance;
- Restoration and maintenance of the architectonic view of Managalem area;
- Restoration of amortized buildings and building of the fire protection infrastructure, in historic areas;
- Establishment of signals and security measures along cultural and passage itineraries;
- Rehabilitation of the riverbed of the Osumi river;
- Integrated management of Osum River waters, etc.

Additional committed projects are:

- Water supply is being implemented by KfW;
- Investment on sewage system will be realized by KfW in 2017-2020;
- Urban Waste management is under the preparation an agreement between Min. of Urban Development, Swiss Embassy and Region of Gjirokastra on feasibility study and a landfill, but not financed not guarantee;
- AADF plans to financially support the construction of 2 pedestrian zones, but Street lighting is not included;
- UNDP committed to sponsor the construction of accommodation of gipsy families in two multi store buildings and rehabilitate their kindergarten;
- University of Milano prepared a concept study for electric transport to castle.

[4] Thedevelopment was supported by USAID; consultant Coplan/Albanian as Non Governmental Organisation,

9. Annex 1: Funding sources and financial delivery mechanisms for the energy efficiency program

In the following a number of existing external financing sources as well as applicable financial delivery mechanism are briefly outlined. It is at the discretion of the municipal administration to approach donors and financiers to proposing financing of components of the municipal energy efficiency plan which are eligible under the respective international financing facilities or programs.

9.1. EU funds

- **FP Funds (Research Framework Program);** More information can be found at http://web.jrc.ec.europa.eu
- **TAIEX:** Technical Assistance and Information Exchange is an EU instrument that helps partner countries become acquainted with, apply and enforce EU law, and monitor their progress in doing so.
- **IPA Funds (Instruments for Pre-accession Assistance)**
  - The Instrument for Pre-accession Assistance (IPA) is the means by which the EU supports reforms in the 'enlargement countries' with financial and technical help. IPA funds are intended to build up capacities of the countries throughout the accession process, resulting in progressive, positive developments in the region.
  - The City of Gjirokastra can receive funding under component 3 of the IPA Program; Regional Development – for investment in transport, environment and economic cohesion, and associated technical assistance. Participating in such programs should help beneficiary countries to use EU regional funding more effectively once it becomes available through accession

9.2. Albanian Energy Efficiency Fund (as in New Energy Efficiency Law)

According to the new Law on Energy Efficiency - approved on November 2015 – The Fund is suggested as an important financial instrument for energy efficiency, including the following activities:

- improvement of energy efficiency in public lighting;
- improvement of energy efficiency in water supply and waste water disposal
- development of demonstration projects in order to investigate and test new energy technologies or new organizational solutions for the energy sector;
- energy audits carried out in public sector;
- improvement of metering and informative billing
- awareness campaigns and education activities regarding energy efficiency
- investments aiming at the improvement of energy efficiency in private and public buildings, industrial enterprises, and the transportation sector;
- investments aiming at the improvement of energy efficiency in extraction, production and transportation or transmission of energy;

9.3. Multi-beneficiary programs

- GIZ – Open Regional Fund for South Eastern Europe (ORF)
- European Investment Bank (EIB)
- German Bank for Reconstruction (KfW)

- Green for Growth Fund (GGF).….www.ggf.lu
- Western Balkan Investment Facility - WBIF …; http://www.wbif.eu
- The Western Balkans Sustainable Energy Direct Financing Facility (WeBSEDFF); http://www.websedff.com

9.4. Local banks

The Albanian financial market has a relatively normal cost of debt financing conditioned since, for time being the interest rates are relatively low. Banks are lending at the range of 4.9-5.5% on secured loans, and 7-8.5% on unsecured loans.

- The banks have high liquidity (over-liquidity) and are in the market for new financial products, most banks are in active search of new lending products.
- The above mentioned banks had dedicated energy efficiency loan credit lines. Energy efficiency is directly or indirectly covered by various loan products in other banks through their multi-purpose/ all-purpose loans.

Technical assistance is needed especially for carrying out energy audits, preparation of bankable project, tendering for EE equipment, selection of the contractor, monitoring and commissioning.

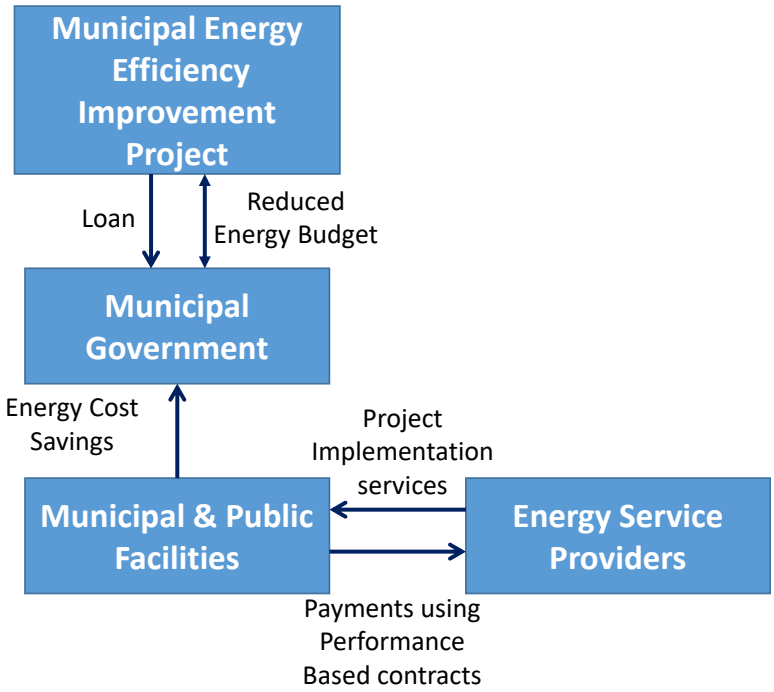
Commercial banks have recognized the investment potential in the energy efficiency sector, which is clearly seen in specialized lines of credit for energy efficiency and renewable energy projects. Pro Credit, BKT and Credins are main banks in Albania which are financing since 2010 EE&RES Projects in Albania. For time being only Pro Credit and BKT have loan to two municipalities: Korca and Pogradec and not related to EE, but for road construction.

9.5. Mechanisms of financing the energy efficiency plan implementation

9.5.1. Budget financing with capital recovery

The flow of funds to pay for energy efficiency improvements follows the same flow as the normal appropriations from the MOF. The repayment to MOF could be complete or partial; the partial approach encourages municipal utilities and public agencies to participate in the program because they retain a share of the savings achieved. Figure 7 below shows a typical structure of a municipal energy efficiency improvement project using budget financing. Under this approach, financing is provided by a government agency, such as a finance ministry, using a combination of government budget allocations and IFI or donor funds. This funding covers the investment costs of the energy efficiency projects in public buildings and facilities of municipal governments. The funding recipient “repays” the funds using the savings generated by the investment project in the form of reduced budgets for energy bills of the municipal government in future years (“budget financing”). The size of the reduced outlay is usually based on the amount of energy cost savings.

Figure 7: Structure of a Municipal Energy Efficiency Project Using Budget Financing



9.5.2. Direct IFI lending to municipal utilities

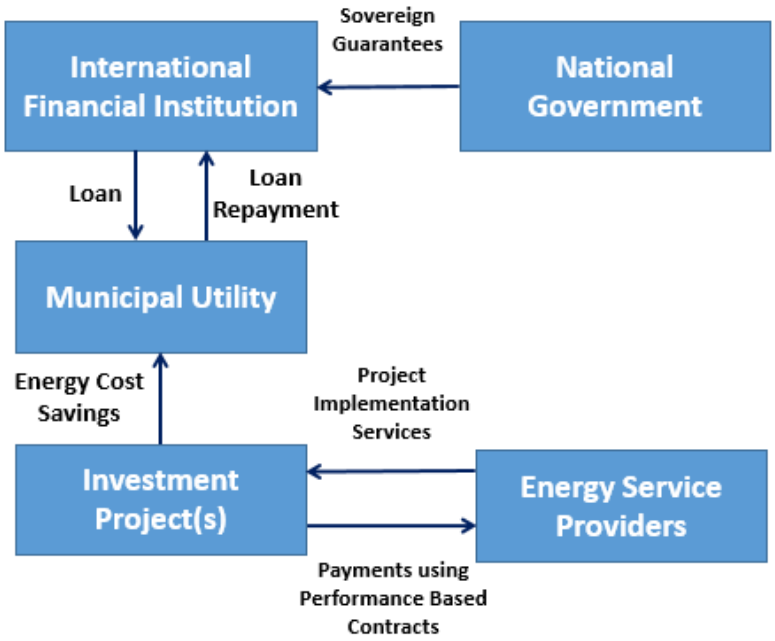
Figure 8 shows the structure of this financing option. Improving energy efficiency in municipal utilities often entails large infrastructure investments. In such cases, an IFI may provide a loan directly to a municipal utility, with a sovereign guarantee from the national government. The advantages of this option are as follows:

- While the municipal utility may be capable of repaying the loan with low risk, it may not meet the creditworthiness requirements of commercial banks, and may therefore not be able to get the needed financing without the IFI loan.

- Incentives are aligned between the lender and borrower to seek approval for, and systematic adjustment of, economically justified tariffs from the national regulator.
- The IFI and the utility can closely work together during project preparation and implementation, creating an opportunity for customized capacity building in areas such as feasibility analysis, procurement, and financial management.

A disadvantage of this approach is that it requires the IFI to appraise each loan, which makes it impractical to serve the needs of many small and medium-sized municipal utilities.

Figure 1: Direct Lending by IFI to Municipal Utilities

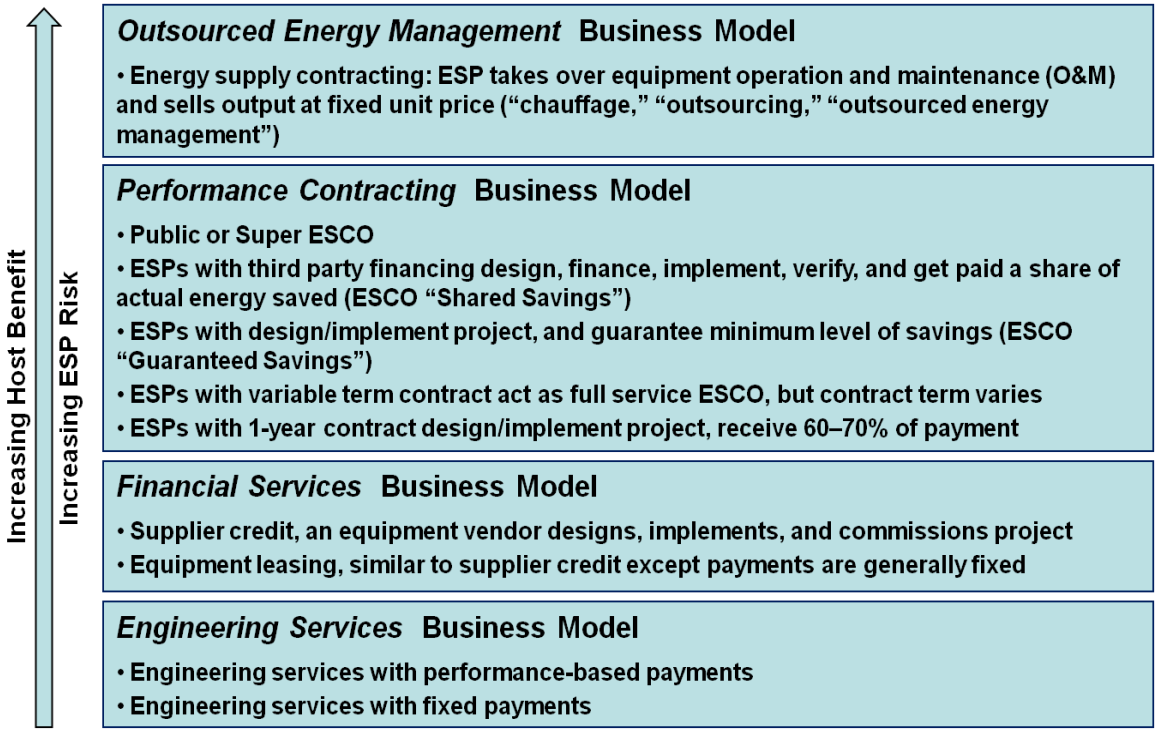


9.5.3. Leveraging commercial financing with private ESCOs

"Energy performance contracting" according to the Albanian Energy Efficiency Law approved in November 2015 means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, where investments in that measure (labor, supply or service) are paid from the beneficiary in relation to a contractually agreed level of energy efficiency improvement. In order to be implemented ESCO (equal to "Energy performance contracting") under the above mentioned EE Law it is important to be approved the respective secondary legislation, which is not yet prepared. Performance contracting refers to energy efficiency implementation services offered by private ESCOs under energy savings performance contracts (ESPCs). The business models typically utilized by ESPs are illustrated in the figure below.

Private ESCOs can help overcome important barriers to scaling up implementation of public sector energy efficiency projects. They can (a) offer a range of services spanning the energy services value chain and (b) provide the technical skills and resources needed to identify and implement energy efficiency opportunities, perform services using performance based contracts (thereby reducing the risks to the municipal utilities and public agencies), facilitate access to financing from commercial lenders, and enable energy users to pay for services out of the cost savings achieved.

Figure 2: Summary of Business Models for Energy Service Companies (ESCOs)



Before an energy service market for the public sector can be developed, the government must first undertake a set of legislative, regulatory, and policy initiatives targeted at:

- Creating a large and stable demand for energy services projects in the public sector;
- Removing barriers to public procurement of energy efficiency services and establishing clear regulations, rules and procedures for public agencies to work with private ESCOs; and
- Facilitating adequate and affordable financing of private ESCO projects.

ESPCs have the following key attributes:

- Under the performance contract, ESCOs offer specific performance guarantees for the entire project (as opposed to individual equipment guarantees offered by equipment manufacturers or suppliers) and generally guarantee a level of energy and/or cost savings.
- Payments to the ESCO are contingent upon demonstrated satisfaction of the performance guarantees.
- Most of the technical, financial, and maintenance risk is assumed by the ESCO, thereby substantially reducing the risks to the energy user.
- ESCOs offer a complete range of implementation services, including design, engineering, construction, commissioning, and maintenance of energy efficiency measures, and monitoring and verification of the resulting energy and cost savings.
- ESCOs provide or arrange financing (often 100 percent) and undertake "shared savings" or "guaranteed savings" contracts, such that the payments to the ESCO are less than the cost savings resulting from the project implementation.

10. Green House Gasses Reduction for Gjirokastra Municipality

The GHG inventory in the TNC is developed using the 1996 revised IPCC Guidelines. It has a narrower and deeper analysis than the previous inventory (i.e., more detailed activity levels, data permitting) with the baseline year of 2005, the last year for which it is anticipated that as complete a data record as possible will be available. Given the role of the energy activity, the inventory adopted the higher tiers of the IPCC methodology and maintained a strong data validation focus on the energy and transport sectors. The inventory covers the refined time-series for the period 2000-2009. Since the SNC, there have not been any major studies to improve emission factor or other estimates. A legal framework is recommended as part of the TNC to address the basis for future updates to the GHG inventory. The IPCC Good Practice Guidelines is applied to all categories. Specific institutional arrangements were put in place to ensure the sustainability of the process of preparing the GHG inventories. Four professionals were engaged to form the GHG inventory team (each of them responsible for one or more sectors) and capacity building of the relevant structures within Ministry of Environment and its relevant Environment Agency, other line ministries/agencies, academia, universities and interested professionals in order to ensure the continuous and regular updating of the national GHG inventories and the possible establishment in the near future of a Monitoring, Reporting and Verification (MRV) system. Training materials were prepared for each sector, including a step-by-step process for completing inventory tables, explanation of good practices and sources of data and emission factors.

Data for each activity rate, emission and conversion factor were documented directly in the sectorial and sub-sectorial MS Excel worksheets of the IPCC software (1996 IPCC Software for National Greenhouse Gas Inventories). This documentation procedure increases the long-term sustainability and transparency of the Inventory Process. As above-mentioned, relevant recommendations are provided in the form of a draft Governmental Decree to ensure a legally binding national system for collecting/managing and processing the necessary data to developing the Greenhouse Gas Inventory on a regular basis (please look at the attachment No.1). As part of the Process, the National Climate Change Steering Committee has been appointed and regularly updated with the TNC Process, providing information and policy guidance, to furthermore ensure the streamlining of the results of the TNC to sectorial policies and/or strategies. The Steering Committee comprises representatives of Ministry of Environment, Ministry of Energy and Industry, Ministry of Transport and Infrastructure, Ministry of Urban Development, Ministry of Economy and Tourism, Ministry of Agriculture, Ministry of Health, Ministry of Internal Relations, Academy of Science, Agency of Environment, Institute of Geosciences, Water and Environment, and environmental related NGOs. As part of the efforts to mainstream climate change into sectorial policies, the Interministerial Committee on Climate Change has been established by an Order of the Prime Minister on April, 2014, led by the Deputy Minister of Environment with all other line ministries siting there at the level of the general technical directors. The Interministerial Committee has been updated accordingly. All activity data concerning each sector are national. The main activity data source/provider are Ministry of Environment, Ministry of Transport and Infrastructure, Ministry of Energy and Industry, National Agency for Natural Resources, Ministry of Agriculture and Rural Development, Extractive Industries Transparent Initiative, and the INSTAT, although they did not provide activity data for GHG inventory purposes according to the IPCC nominations. Other data providers/sources are Bank of Albania, General Directory of Customs and different data bases, surveys and studies assisted by international organizations (like the World Bank,

UNDP, EBRD, EIB, FAO, EU, etc.), public/private universities and different NGOs. As regards the emission factors, they are represented by default factors provided by IPCC 1996 Revised Guidelines.

Methodology: The TNC inventory is based on the IPCC's Revised 1996 Guidelines. It has a narrower and deeper analysis than the previous inventory and has addressed all emission/sink categories called for in the IPCC methodology with particular focus on bottom-up and detailed focus on the energy/transport sector. The baseline is the year 2005.

- *Industrial cement production*: Given the increase in cement production, there was a need for a detailed study on CO_2 equivalent emissions from cement factories which took the form of a small study for activity data validation and/or macroeconomic impact: related NAMA.
- *Fuel wood consumption/Transport Sector*: Given the role of the energy activity, particularly the transport sector, the inventory has maintained a strong data validation focus on the energy and transport sectors.
- *Data uncertainties:* There was foreseen a high data uncertainty in the mining and solvents sectors, due to both data shortcomings and lack of trained inspectors. To overcome this, the TNC identified the policy developments in the mining sector. As for solvents, given their negligible importance to the inventory it was advised that they be excluded from the TNC inventory. The evaluated uncertainty is **9.925%** and the main contributor is fuel wood consumption from different sector (residential, service (public and private) and small agro-food industries) (more detail analysis is presented at chapter 9). Second contributor of uncertainty of GHG emissions inventory is data activity by industrial cement factories. As previosly mentioned, the uncertainty in the cement industry is mitigated by much more elaborated data coming from a separate study related to preparation a a NAMA (National Appropriate Mitigation Action) on using non-hazardous waste as fuel for the cement industry (look at the Attchement 2). On the other hand, a biomass survery is carried out to mitigate the uncertainties regarding the fuel wood consumption.
- *Barriers*: The liberalization, privatization and subsequent fragmentation of the oil and energy sector has made it much more difficult to obtain data. The TNC inventory team however managed in close cooperation with the Directory of Hydrocarbons Policy within the Ministry of Energy and Industry to apply appropriate estimation techniques to develop the GHG inventory for energy and to undertake the necessary internal consistency checks, including spot surveys for data collection as needed.
- *Sector-specific limitations.* The TNC provided information on whether and how recent studies in the transport sector have improved data reporting. Also, the TNC managed to address the issue of inventory uncertainty with regards to wood collection, particularly illegal cutting and individual collection by implementing a field data testing program. This was needed because the SNC inventory team found it difficult to harmonize the Energy and LULUCF components of the IPCC's methodology regarding fuel wood consumption. Limited field fuel wood surveys and data testing helped as well to validate consumption levels and establish benchmarks that can be used to harmonize results.

Albania's third GHG inventory covers all sources and sinks as well as all gases as mandated by 10/CP2: it considers five main modules such as energy, industrial processes, agriculture, waste, and LULUCF, as guided by revised IPCC of 1996. The national inventory has considered three direct GHGs such as: CO_2, CH_4 and N_2O and three indirect GHGs such as: CO, NO_x, and SO_2. Estimates of key sources have been provided as well. Aggregated GHG emissions and removals expressed in CO_2 equivalent have been provided too.

Dioxide carbon emissions released from energy & transport, have been estimated by utilization of two approaches: top-down (total for 4,501.55 kt) and bottom–up (total for 4,493.32 kt), according to which, emissions from separate sectors and source categories are estimated, and then emissions are also summarized. Usage of these two approaches allowed Albania to judge on the fuel spectrum of the carbon dioxide emissions (top-down), and on the sector distribution (bottom-up). In both approaches, the default IPCC emission factors for each fuel type are used. Performed estimation showed that difference between the two approaches is about 0.18%. Also a detailed analysis is done concerning CO_2 emissions from other sectors: Land Use, Land Change and Forestry, Agriculture, Waste and Industrial Processes.

Methane emissions coming from the Agriculture, Waste, Energy & Transport, Industrial Processes and Land Use, Land Use Change & Forestry are also estimated. To evaluate the amount of emissions from coal mining and hydrocarbon fuel extraction the amount of extracted fuel was multiplied by the emission factor, which depends upon the type of coal mining or upon the stage of fuel processing in the oil and gas sector. Methane from oil extraction industry has been increased slightly related to the increase of crude oil production. Methane emissions from livestock are evaluated by multiplying the livestock population (cattle, sheep, etc.) by the corresponding emissions coefficients.

Nitrous oxide emissions from fossil fuel combustion are obtained by multiplying the energy content of coal, oil products, and gas consumed by the corresponding emission factors, as given in the IPCC Guidelines. Emissions of **indirect greenhouse gases** such as carbon monoxide and nitrogen oxides are estimated as well according to the IPCC Methodology. Total direct GHG emissions (CO_2, CH_4, N_2O) for Albania for the base year 2005 amount to 9,830.16 kt CO_2 eqv. by five main categories Energy, Industry, Agriculture, Waste and LULUCF. The time series of emissions per sector for the period 2000 – 2009 are presented in Table 8.

Table 8: Anthropogenic greenhouse gas emissions in Albania, (kt)

Gases	Sectors	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CO_2	1 Energy	3,992.89	4,024.08	4,142.96	4,311.75	4,556.10	4,493.32	4,530.38	4,579.05	4,632.29	4,969.44
	2 Industrial Processes	520.00	852.00	806.00	966.00	1,043.00	1,118.00	1,195.00	1,470.00	1,547.00	1,623.12
	3 Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4 Land-Use Change & Forestry	3,303.00	2,506.00	2,055.00	1,719.00	1,790.00	1,715.00	1,638.00	1,617.00	1,179.00	911.00
	5 Waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**7,815.89**	**7,382.08**	**7,003.96**	**6,996.75**	**7,389.10**	**7,326.32**	**7,363.38**	**7,666.05**	**7,358.29**	**7,503.56**
CH_4	1 Energy	4.36	4.39	4.56	4.78	5.06	4.99	5.03	5.09	5.15	5.15
	2 Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3 Agriculture	73.74	71.74	69.55	70.09	67.02	66.63	65.29	60.93	57.17	53.66
	4 Land-Use Change & Forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5 Waste	24.14	24.24	24.19	24.65	26.69	26.96	30.30	30.66	29.08	35.28
	Total	**102.24**	**100.37**	**98.30**	**99.52**	**98.77**	**98.58**	**100.62**	**96.68**	**91.40**	**94.09**
N_2O	1 Energy	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10
	2 Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3 Agriculture	0.010	0.010	0.009	0.009	0.008	0.007	0.006	0.005	0.004	0.003
	4 Land-Use Change & Forestry	1.01	1.04	1.01	1.01	1.02	1.01	1.02	1.01	1.01	1.03
	5 Waste	0.27	0.27	0.27	0.27	0.28	0.28	0.28	0.28	0.28	0.28
	Total	**1.38**	**1.41**	**1.38**	**1.39**	**1.40**	**1.40**	**1.40**	**1.40**	**1.40**	**1.41**
CO2eqv	1 Energy	4112.35	4144.17	4266.62	4443.13	4693.36	4629.11	4667.01	4716.94	4771.44	5108.59
	2 Industrial Processes	520.00	852.00	806.00	966.00	1043.00	1118.00	1195.00	1470.00	1547.00	1623.12
	3 Agriculture	1551.55	1509.46	1463.319	1474.509	1409.798	1401.367	1372.986	1281.095	1201.774	1127.733
	4 Land-Use Change & Forestry	3616.10	2829.02	2368.41	2033.03	2104.65	2028.72	1952.96	1930.41	1493.03	1229.99
	5 Waste	590.64	592.74	591.69	601.35	647.29	652.96	723.1	730.66	697.48	827.68

(Source: IPCC Methodology-Albania, years 2000-2009)

GHG emission for Gjirokastra for both scenarios will be calculated based on the energy demand for residential and service sectors for both scenarios. Energy demand for both sectors, residential and service sectors, has been sum up and it is presented in the **Figures 9** and **10** for all services and for both scenarios.

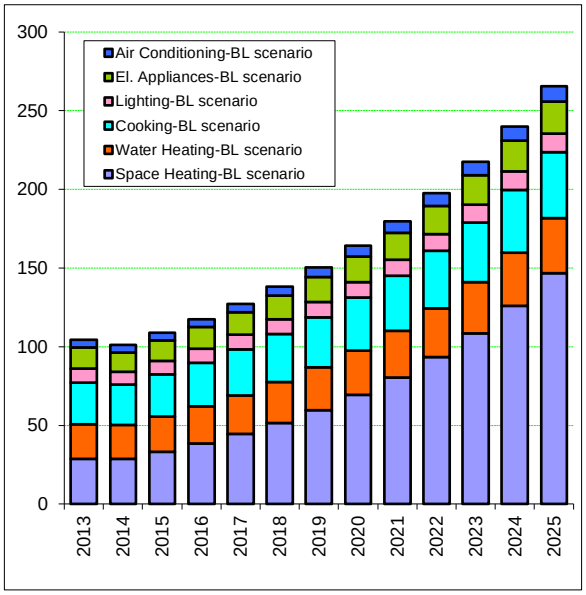


Figure 9: Energy Demand for all End-users of Residential and Service Sector according to Baseline Scenario (ktoe)

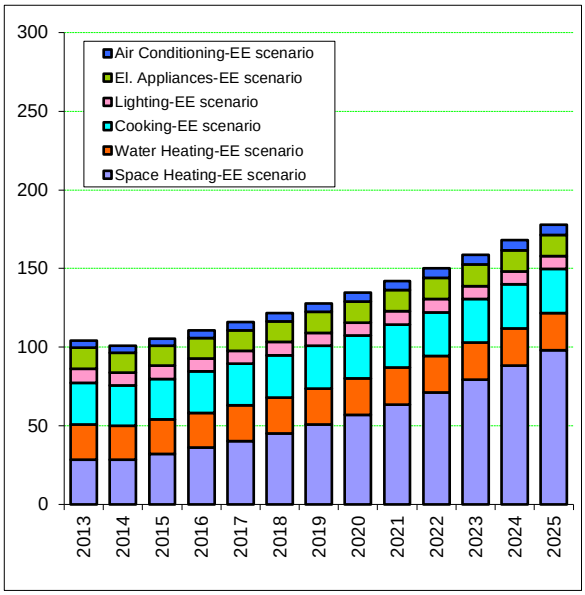


Figure 10: Energy Demand for all End-users of Residential and Service Sector according to EE Scenario (ktoe)

Energy demand for both sectors, residential and service sectors, has been sum up and it is presented in the **Figures 11** and **12** for all energy commodities and for both scenarios.

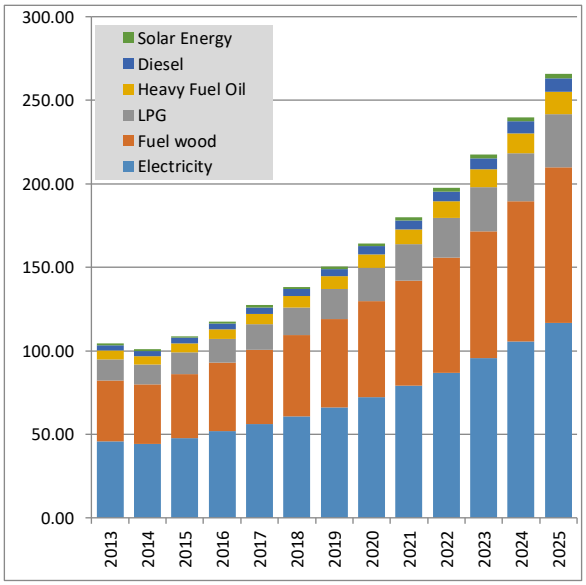


Figure 11: Energy Demand for all End-users of Residential and Service Sector according to Baseline Scenario (ktoe)

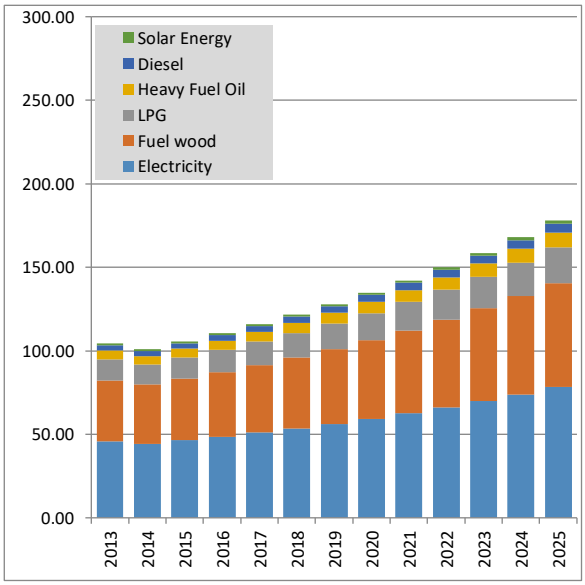


Figure 12: Energy Demand for all End-users of Residential and Service Sector according to EE Scenario (ktoe)

Energy demand for both scenarios and both residential and service sectors has been sum up and it is presented in the **Figure 13**. In the same graphs are presented also the energy savings for Gjirokastra Municipality and it could be reached to 33%. In addition, in the **Figure 14** it is shown the calculation of energy savings for all commodities and for both sectors.

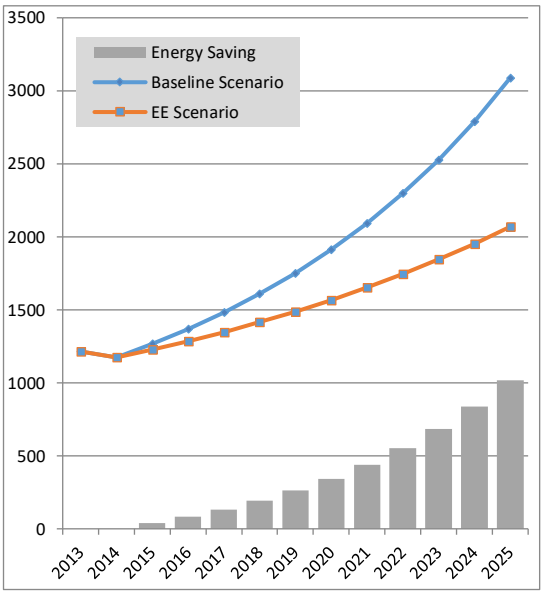


Figure 13: Energy Demand for all End-users of Residential and Service Sector according to Baseline and EE/RES Scenarios (GWh)

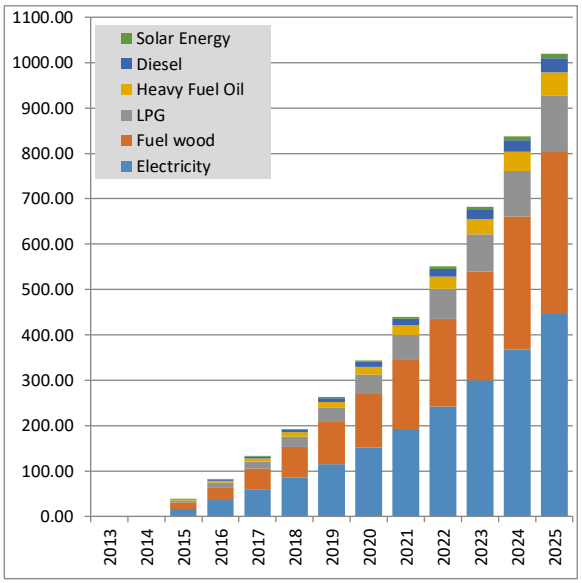


Figure 14: Energy Saving for all End-users of Residential and Service Sector according to EE Scenario (GWh)

The energy savings for Gjirokastra Municipality could be reached to 1,020 GWh. This value is equal to 10% of total energy consumption of Albania for all commodities and for both sectors.. Analysing the energy demand will give the possibility to calculate GHG emission for baseline and EE/RES Scenario of Gjirokastra Municipality.

GHG emission for both scenarios and both residential and service sectors has been sum up and it is presented in the Figure 15. In the same graphs are presented also the GHG reduction for Gjirokastra Municipality and it could be reached to 35.55%. In addition, in the Figures 16, 17, 17 it is shown the calculation of SO2, NOx and NMVOx reductions for all commodities and for both sectors and both scenarios.

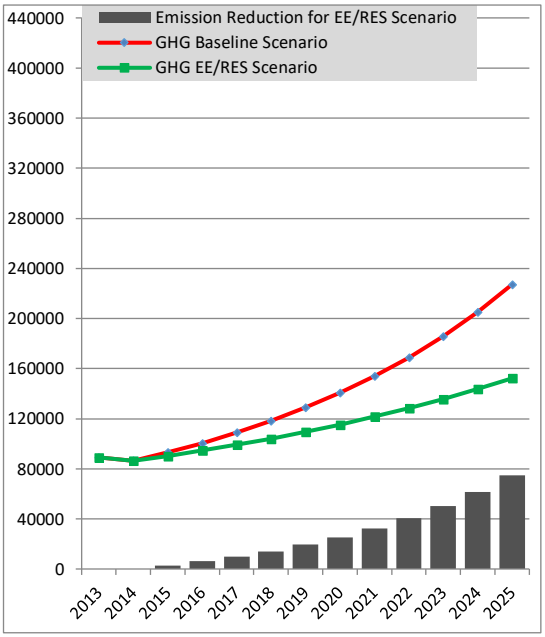


Figure 15: GHG emissions for all End-users of Residential and Service Sector according to Baseline Scenario according to Baseline and EE/RES Scenarios (tons CO2 eqv)

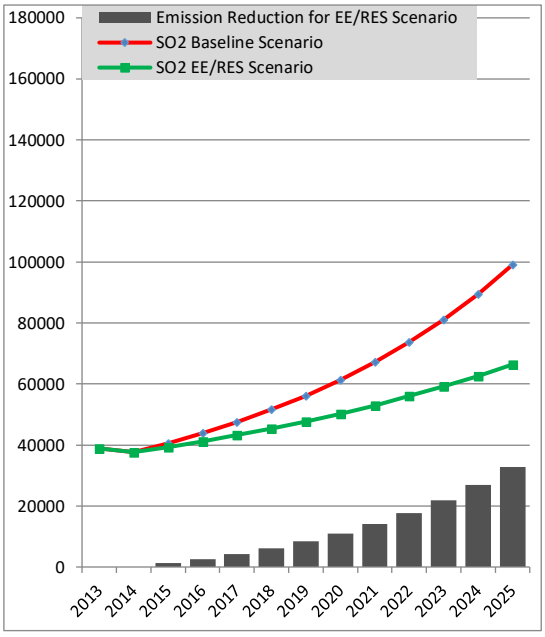


Figure 16: SO2 emissions for all End-users of Residential and Service Sector according to Baseline Scenario according to Baseline and EE/RES Scenarios (tons SO2)

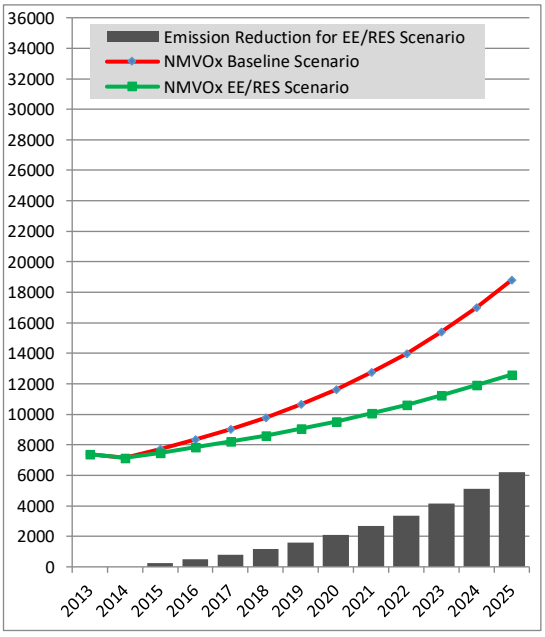


Figure 17: NOx emissions for all End-users of Residential and Service Sector according to Baseline Scenario according to Baseline and EE/RES Scenarios (tons NOx)

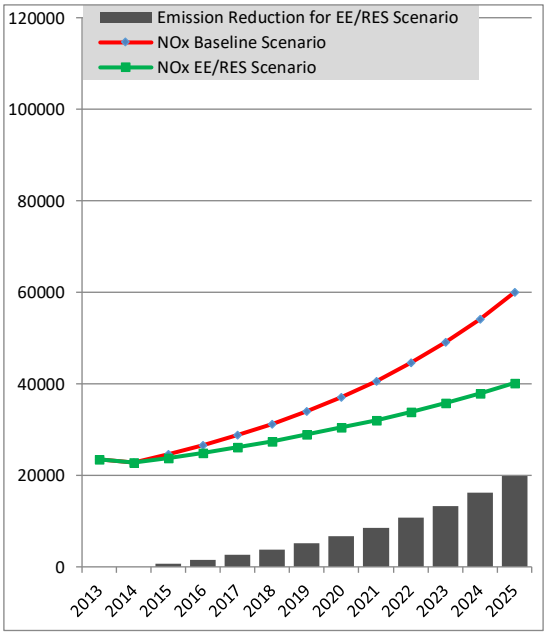


Figure 18: NMVOx emissions for all End-users of Residential and Service Sector according to Baseline Scenario according to Baseline and EE/RES Scenarios (tons NMVOx)

Table 9: Yearly figures for CO2, SO2, NOx and NMVOx reductions for all commodities and for both sectors and both scenarios

CO2		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Electricity	0	0	6346	13713	22279	32256	43896	57501	73431	92119	114080	139930	170406
	Fuel wood	0.00	0.00	132.84	287.06	466.38	675.21	918.87	1203.66	1537.14	1928.34	2388.04	2929.16	3567.12
	LPG	0	0	1192	2575	4183	6057	8242	10797	13788	17297	21421	26274	31997
	Heavy Fue	0	0	495	1070	1738	2516	3424	4485	5728	7185	8898	10915	13292
	Diesel	0	0	297	642	1043	1510	2054	2691	3437	4311	5339	6549	7975
	Solar Ener	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	0	0	8463	18287	29710	43013	58535	76677	97921	122841	152126	186597	227237
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	GHG Base	89201	86358.81	93088.58	100578	108935.6	118286.8	128777	140574.8	153875.8	168907	185931.8	205256.5	227237
	GHG EE/RE	89201	86358.81	90295.93	94543.35	99131.39	104092.4	109460.4	115271.4	121561.9	128369.3	135730.2	143679.5	152248.8
	Emission R	0	0	2792.658	6034.682	9804.203	14194.41	19316.55	25303.47	32313.93	40537.67	50201.58	61576.94	74988.19

SO2		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Electricity	0	0	3006	6496	10553	15279	20793	27237	34783	43636	54038	66283	80719
	Fuel wood	0.00	0.00	66.42	143.53	233.19	337.61	459.43	601.83	768.57	964.17	1194.02	1464.58	1783.56
	LPG	0.00	0.00	71.29	154.05	250.28	362.35	493.11	645.94	824.90	1034.83	1281.53	1571.92	1914.28
	Heavy Fue	0.00	0.00	341.60	738.16	1199.25	1736.27	2362.81	3095.13	3952.65	4958.58	6140.68	7532.11	9172.59
	Diesel	0.00	0.00	204.96	442.90	719.55	1041.76	1417.68	1857.08	2371.59	2975.15	3684.41	4519.27	5503.55
	Solar Ener	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	0.0	0.0	3690.3	7974.5	12955.7	18757.1	25525.7	33437.1	42701.1	53568.3	66338.6	81370.5	99092.7
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	SO2 Base	38898	37659.06	40593.76	43859.73	47504.26	51582.1	56156.64	61301.4	67101.66	73656.38	81080.5	89507.54	99092.72
	SO2 EE/RE	38898	37659.06	39375.94	41228.15	43228.88	45392.24	47733.14	50267.15	53010.31	55978.85	59188.76	62655.28	66392.12
	Emission R	0	0	1217.813	2631.584	4275.384	6189.852	8423.496	11034.25	14091.35	17677.53	21891.73	26852.26	32700.6

NOx		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Electricity	0	0	167	361	586	849	1155	1513	1932	2424	3002	3682	4484
	Fuel wood	0.00	0.00	92.99	200.94	326.46	472.65	643.21	842.56	1076.00	1349.84	1671.63	2050.41	2496.98
	LPG	0.00	0.00	1639.68	3543.19	5756.42	8334.08	11341.48	14856.63	18972.73	23801.20	29475.25	36154.15	44028.41
	Heavy Fue	0.00	0.00	208.75	451.10	732.88	1061.05	1443.94	1891.47	2415.51	3030.25	3752.64	4602.96	5605.47
	Diesel	0.00	0.00	125.25	270.66	439.73	636.63	866.36	1134.88	1449.31	1818.15	2251.58	2761.78	3363.28
	Solar Ener	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	0.0	0.0	2233.7	4826.8	7841.8	11353.3	15450.1	20238.7	25846.0	32423.6	40153.2	49251.7	59978.5
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	NOx Base	23544	22794.15	24570.45	26547.27	28753.22	31221.44	33990.3	37104.31	40615.07	44582.49	49076.14	54176.83	59978.51
	NOx EE/RE	23544	22794.15	23833.34	24954.44	26165.43	27474.87	28891.76	30425.53	32085.91	33882.69	35825.58	37923.78	40185.6
	Emission R	0	0	737.1136	1592.836	2587.79	3746.573	5098.546	6678.776	8529.165	10699.8	13250.56	16253.05	19792.91

NMVOx		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Electricity	0	0	501	1083	1759	2547	3465	4540	5797	7273	9006	11047	13453
	Fuel wood	0.00	0.00	26.57	57.41	93.28	135.04	183.77	240.73	307.43	385.67	477.61	585.83	713.42
	LPG	0.00	0.00	81.98	177.16	287.82	416.70	567.07	742.83	948.64	1190.06	1473.76	1807.71	2201.42
	Heavy Fue	0.00	0.00	56.93	123.03	199.88	289.38	393.80	515.86	658.78	826.43	1023.45	1255.35	1528.76
	Diesel	0.00	0.00	34.16	73.82	119.93	173.63	236.28	309.51	395.27	495.86	614.07	753.21	917.26
	Solar Ener	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	0.0	0.0	700.7	1514.1	2459.8	3561.3	4846.4	6348.5	8107.3	10170.6	12595.2	15449.2	18814.0
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	NMVOx Ba	7385	7150.042	7707.232	8327.318	9019.278	9793.505	10662.04	11638.84	12740.09	13984.58	15394.15	16994.12	18813.99
	NMVOx EE	7385	7150.042	7476.015	7827.679	8207.543	8618.285	9062.733	9543.846	10064.67	10628.28	11237.73	11895.89	12605.37
	Emission R	0	0	231.2169	499.6391	811.735	1175.221	1599.306	2094.991	2675.419	3356.3	4156.419	5098.237	6208.617