Italian Ministry for the Environment and Territory
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ASSESSMENT OF PROJECTS' POTENTIAL IN THE FIELDS OF RENEWABLE ENERGY SOURCE, ENERGY EFFICIENCY AND FOREST MANAGEMENT, IN THE FRAMEWORK OF THE CLEAN DEVELOPMENT MECHANISM FORESEEN BY THE KYOTO PROTOCOL IN THE REPUBLIC OF ALBANIA

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ABREVIATIONS AND ACRONYMS

ACM	Approved Consolidated Methodology
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CHP	Combined Heat and Power
CoP	Conference of the Parties
DGFP	Directorate General for Forests and Pastures
DH	District Heating
DNA	Designated National Authority
EBRD	European Bank for Reconstruction and Development
EEC	Energy Efficiency Centre
ETS	Emissions Trading System
ERE	Electricity Regulatory Entity
ERPA	Emission Reduction Purchase Agreement
EU	European Union
FNC	First National Communication
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Green House Gases
HFO	Heavy Fuel Oil
HPP	Hydro Power Plants
IMET	Italian Ministry for Environment and Territory
JI	Joint Implementation
KP	Kyoto Protocol
LFG	Landfill Gas
LPG	Liquid Petroleum Gas
LULUCF	Land-Use, Land-Use Change and Forestry
MoU	Memorandum of Understanding
MSW	Municipal Solid Waste
NEA	National Energy Agency
KESH	Albanian Power System
SHPP	Small Hydro Power Plant
TPP	Thermal Power Plant
UNDP	United Nations Development Program
UNECE	United Nations Economic Commission for Europe
UNFCCC	UN Framework Convention of Climate Change
WB	World Bank

THE KYOTO PROTOCOL AND CARBON FINANCE

Introduction

The Kyoto Protocol is an international treaty aimed at contrasting climate change through stabilization of green house gas emissions. The Kyoto Protocol sets emission reduction targets for selected industrialized countries. Parties to the Protocol may comply with their target either by reducing their own emissions through domestic policies and measures or by acquiring carbon credits generated by emission reduction projects. Reduction projects may take place within countries Parties to the Protocol which in turn may or may not have own national reduction targets. In the cases of countries with emissions target credits are generated through the Joint Implementation (JI) flexible mechanism, while in countries without targets credits are generated through the Clean Development Mechanism (CDM). Credits generated through JI and CDM can be used for compliance within either Kyoto or the newly developed European Union Emission Trading System (EU ETS). The EU ETS is a system which sets emission quotas (or ceilings) to installations operating within selected sectors of the European Union. Similarly to the trading mechanisms developed by the Kyoto Protocol, companies may comply with such limits by either reducing their emissions, acquiring emission allowances from other companies or acquiring carbon credits through the JI and CDM mechanisms.

The entry into force, in early 2005, of both the Kyoto Protocol and the EU ETS, have exponentially accelerated carbon market activity aimed at trading carbon emission allowances and carbon credits.

The possibility in the near future of using JI and CDM credits in the EU ETS will bring the prices on the EU ETS and JI/CDM markets to slowly converge. Current and expected prices of JI/CDM credits provide interesting opportunities for industrial initiatives in the JI and CDM countries. Revenues from the sale of carbon credits may have significant impacts on the financial sustainability of projects and has mobilized cross border international investment flows in energy projects together with the associated transfer of clean technology. As a result carbon finance is expected to play a significant role in contributing to both global sustainable development and national economic development of JI and CDM countries.

The Albanian - Italian Cooperation Program

Republic of Albania ratified the United National Framework Convention on Climate Change (UNFCCC) on October, 1994 and it entered into force on 1 January 1995. As a non-Annex I party to the Convention, Albania has finalized and submitted its First National Communication at CoP 8 on October 2002.

Country has finished the first step in the process of preparation of the Second National Communication, by finalizing the self-assessment exercise and by producing the Synthesis Report on stocktaking of climate change activities. As a follow up to the stocktaking exercise, in March 2005, Albania has started UNDP-GEF funded project for preparation of the Second National Communication.

The Kyoto Protocol was ratified in December 2004 (law No. 9334, dated 16/12/2004) and responsibilities of the Designated National Authority have the Climate Change Unit of the Ministry of Environment, Forests and Water Administration.

On May 30, 2005 the Italian Ministry for the Environment, Land and Sea has signed with the Albanian Ministry of Environment, Forestry and Water Management, the Memorandum of Understanding, aimed at developing programme of technical assistance in evaluation of interventions focused on emission reductions. The main objective of this programme of assistance is the introduction of preconditions for development of emission reduction projects (recognized at the international level) into the Albanian institutional and legal system, through establishment of a permanent local unit able to implement provisions of United Nations Framework Convention on Climate Changes (UNFCCC) and Kyoto Protocol.

Development of emission reduction projects within the Clean Development Mechanism

During the first session of the Joint Committee, established under the MoU on cooperation in the field of the Clean Development Mechanism (CDM) foreseen by the Art. 12 of the Kyoto Protocol, between the Italian Ministry for the Environment, Land and Sea and the Albanian Ministry of Environment, Forestry and Water Administration, the respective Work Plan has been approved, foreseeing assistance to the competent environmental institutions, in regard to the participation of the country in the flexible mechanism of the Kyoto Protocol on one hand, and assistance in the identification of potential CDM projects on the other.

CDM carbon opportunities

The Republic of Albania presents an attractive opportunity in terms of carbon finance, taking into account that the Kyoto Protocol has been ratified and the DNA designated.

As described in more detail in the sections below, preliminary analysis estimates the aggregate CDM carbon potential of the Republic of Albania to be around 2,5 Mt CO_{2eq} per year.

Table 1. Summary of the CDM carbon potentials

Sector	Sub-sector	Carbon potential per year, ktCO2eq
Energy Sector	Industry	180
	Agriculture	6
	Residential	75
	Others	135
	TOTAL	396
Renewable Energy	Hydro	1.200
	Biomass	50
	Solar	15
	Wind	42-62
	Geothermal	NA
	TOTAL	1.307-1.327
Waste Sector (MSW + Manure treatment)		110
LULUCF		620
TOTAL		**2.433 – 2.453**

When valued at expected market prices ranging between 6€ and 9€ per ton of CO_2, the resulting potential carbon investment can be expected to range between 14,5 million€ and 22 million€ per year. In the following paragraphs the sector level potential is examined in more details, while the next chapter looks at specific opportunities identified.

ENERGY SECTOR

Over the transition period from a centrally-planned to a market-based economy, the country of Albania, like most other transitional countries, experienced deterioration in different sectors, including the energy sector. In an attempt to address the fundamental issues affecting the energy sector, the Government of Albania is initiating an action to reverse the deterioration in sector performance. Despite the encouraging start, however, the sector's problems are so deep-rooted that sustained efforts will be needed for a considerable period of time, supported by critically needed investments.

From a historic peak of 3,3 Mtoe in 1989, when all Albanian economy operated in its full capacity, the primary energy supply in Albania dropped by more than 50% or to 1,5 Mtoe in 1992. Since then, the primary energy supply has remained relatively constant around the level of 1,6-1,7 Mtoe. Currently, the energy sector contributes to approx. 10% of the GDP and employs approximately 17.000 employees.

The total installed power generation capacity up to date is 1.659 MW, including 1.446 MW of hydropower. The rest of installed capacity refers to thermal power, but out of eight TPPs installed in Albania, only the power plant in Fier is still partially in operation, i.e. the total installed generating capacity at Fier TPP is 159 MW, but only 8 MW are operational. Therefore, domestic electricity production relies mainly on hydro power (more than 95% of total energy supply), while significant amount of electricity is being imported.

The thermal based generation has remained stable over the years and accounts for 100 GWh per year. However, World Bank, European Bank of Investments and European Bank for Reconstruction and Development have expressed their support to finance a new combined-cycle TPP, fueled by distillate oil at a six-hectare Greenfield site about six km north of Vlore adjacent to an offshore oil tanker terminal. The plant would be designed to allow conversion to natural gas if and when imported gas is brought to Albania. The plant size would be 85 MW - 135 MW depending on the evaluation of bids, which would be requested for this range of plant size.

In regard to energy consumption, in 1990, the industry consumed 50% of the total sources, declining to 35% in 1992 and 17% in 2001. Transport was the sector that experienced a continuous increase of the energy sources consumption. In 1990 the transport sector consumed 6% of the total energy, reaching the value of 44% in 2001. Another sector that experienced changes was the residential sector, with a consumption of 14,6% of the total in 1990 reaching a level of 21% in 2001. Service sector also experienced high rates of increase of energy consumption passing from 5,4% in 1990 to 16,5% in 2001.

Table 2. Electricity consumption disaggregated per sector

Consumption (GWh)	2001	2002	2003	2004	2005
Households	2.444	2.640	2.644	2.642	2.623
Industry	741	836	878	939	1.005
Big Industries	260	318	350	383	433
Services	406	641	689	741	795
Water supply	197	204	207	211	215
Agriculture	72	81	90	100	111
Total	**4.120**	**4.720**	**4.858**	**5.016**	**5.182**

The Action Plan (2003-2006) to the Energy Strategy has foreseen several proposals on electricity prices, i.e. increase of average tariff every year by 8% for all consumers' categories (10% for residential consumers and 5% for other consumers) and abolishing of privileged consumers in year 2008, except for water main enterprises, that will last until year 2009.

Another issue related to tariffs (especially residential ones) is the two-block division and low limit level of monthly electricity consumption. New tariff system should contribute to reduction of electricity consumption (particularly for space heating), promotion of efficient electricity use and use of alternative energy sources, and all that in order to meet new investments and to reduce Government's subsidies for electricity import.

Legal and institutional framework

The Ministry of Economy, Trade and Energy is responsible for the entire energy sector (oil, gas, electricity and renewable energy sources). Its principal task is to push forward the process of reforms in the energy sector while opening the energy market for private investors and adapting it to satisfy European directives.

The National Energy Agency (NEA), which serves as an advisory institution, has prepared a number of studies and scenarios on the Albanian energy sector. NEA also designed the national energy strategy, which has been approved in June 2003 by the Government of Albania, according to the Decision of the Council of the Ministers no. 424 dated 26/06/2003. The strategy that is now in the process of updating, foresees the development of the energy sector until 2015 and forms the basis for new negotiations on the future orientation and structuring of the energy market. It also provides recommendations for action in the energy sector.

The Albania-EU Energy Efficiency Centre (EEC) began as an action under the SYNERGY Programme in April 1993 and was officially established in November 1995 with the full support of European Commission and Albanian Government. By establishing EEC, the Albanian Government has fulfilled part of its commitment under "The Protocol of the Energy Charter Treaty for Energy

Efficiency and the Environmental Aspects concerned with it", which Albania signed in 1995. EEC is collaborating with other countries to promote and improve the energy efficiency of the Albanian economy and to protect the environment. EEC provides the technical and other expertise to make this possible. It also promotes the use of renewable energy sources, which besides having a lower environmental impact reduce the rate of depletion of conventional fuels. EEC is the only specialised institution in Albania that works in the above mentioned fields, and now it has become a self-financed organisation through providing services in the field of the rational use of energy, renewable energies, and through its involvement in various programs and activities with the support of the Albanian Government and European Commission.

Korporata Elektroenergjitike Shqiptare (KESH) - the only actor on the Albanian electricity market to date is the state-owned enterprise KESH-operator of Albanian Power System (APS), which is a completely vertically integrated power utility. KESH was transformed into a state-owned joint-stock company in 1995. However, with the collapse of the financial system in 1997, the privatization of KESH and those three firms – the local utilities in the Elbasan, Vlore and Shkoder districts – was put aside indefinitely, and the pilot firms were re-integrated into KESH.

Regulatory Agency for Electricity (ERE) is responsible for the regulatory affairs in the sector of electricity in Albania. It was established in May 1996 with a three-member steering council. According to the Law on Power sector, No. 9072, dated 22/05/2003, and in the context of harmonizing national regulatory system with the Stabilization and Association process, the Agency has become fully independent from the Government and it is directly responsible to the Parliament. This way the basic ground for non-discrimination, competition and efficient functioning of the electricity market has been established. The Agency is responsible for the monitoring of functioning of the electricity market, in line with the Article 23 of the EU Directive 2003/54/EC.

Adopted Basic Laws in the Energy Sector

In compliance with the Law No. 9072, dated 22/05/2003, the Regulatory Agency has prepared draft of the Market Model of Electricity Market. This model meets all requirements foreseen by the National Energy Strategy, the Energy Policy Document, the EU Directive 2003/54, the Athens Memorandum II, as well as Law on Power sector, No. 9072 dated 22/05/2003.

The development of the electricity market is based on a transitory model approved by the Albanian Government in 2004 and EU Directive on electricity 2003/54. The Transitory Market Model for Albania takes into account the lack of New National Dispatching Centre, the insufficient capacities of interconnections with the neighboring systems and the restructuring process of KESH.

It is expected to be possible for Albania to actively participate in the Regional Electricity Market after 2007.

Operating of energy market in Albania relies mainly on the following legal instruments:

Law on power sector, No. 9072 dated 22/05/2003, which intends to ensure the conditions for energy supply to consumers. The text of the Law reflects the requirements of the EU Directive 2003/53/EC;

Law on police for electricity, No. 8637 dated 6/7/2000, has established an enforcement body to prevent illegal connecting to the grid or any other illegal activity related to supply of electricity;

Decision of the Council of Ministers on approval of the transitory model of the electricity market, No. 539 dated 12/08/2004, based on the gradual implementation of EU Directives No. 96/92/EC and 2003/54/EC;

Power sector Policy Document that was approved by the Government in 2002;

Law on ratification of the Treaty establishing the Energy Community, No. 9501 dated 03/04/2006.

Law no 9663, of 18.12.2006 on “Concessions”; DCM no 27, of 19.1.2007 on “The adoption of the rules for the evaluation and granting of concessions”.

Energy savings potential

The actions that lead to the reduction of GHG emissions should consist of the increase of energy efficiency, energy savings and usage of economic, regulatory and legal instruments. The most common measures identified so far include introduction of thermal insulation and solar water heating systems in households, services, and public buildings, DH and CHP systems, LPG and fuel wood as energy source, and increase of public transport share.

When it comes to electricity demands, according to the active scenario by the year 2015, the energy savings are expected to be around 22,48% of the total energy consumption. The contribution in these savings by 2015 shall come from transport sector (27,28%), industry (24,58%), agriculture (24,67%), service (17,86%), and residential sector (7,4%).

In regard to the energy consumption in industrial sector, the sub-sectors that accounts for roughly 45% of all industrial energy consumption are iron and steel, chemicals, pulp and paper, petroleum refining and cement.

The main industries responsible for the direct and indirect GHG emissions are cement, lime, chromium, iron and steel, due to obsolete and unproductive technologies, low quality of fuel, etc.

The most important changes regarding energy efficiency improvement are the replacement of old and inefficient technologies and production processes, as well as increasing usage of mechanization. Considering manufacturing and mining as a whole, energy intensities in physical terms decreased by about 18% for electricity and increased by about 22% for heat uses. Audits have shown very low figures of power factors ($\cos \varphi$) in the range of 0,55-0,7.

Renewable energy potential

Hydro-energy

Albania has a major hydropower potential of which only 35% is being exploited so far. Hydropower capacity installed up to 2002 is 1.446 MW. Average output from hydropower is 4.162 GWh. The total hydropower reserves are estimated around 3,000 MW and the potential of annual generation may reach 10 TWh. The new probable Hydro Power Plants (HPPs) to be constructed in the future are those on Drini river: Bushati HPP [84 MW], Peshkopi (Skavica 1) [130 MW]; (Skavica 2) [350 MW], on Vjosa river: Kaludha HPP [75 MW]; Dragot-Tepelena HPP [130 MW] and Kalivaci HPP [100 MW], and on Devoll river: Bratila HPP [115 MW] and Banja HPP [80 MW].

In regard to the small hydro power plants, installed capacities in Albania range from 50 kW to 2.5 MW. Until 1988, there were 83 SHPPs (SHPP means less than 3 MW) built, with capacity ranging from 5 to 1200 kW, with a total capacity of 14 MW and annual output of 12 GWh. Out of 83 SHPP, 20 are not operational, 15 are sold in auction and 48 are under concession. Out of 15 sold in auction, 6 are operational and out of 48, which have been given for concession, 20 are operational. From the studies already performed only 19 SHPP could be economically refurbished at a total cost of USD 7,3 million in total. The average life of these SHPPs is 25 years.

In terms of possible new locations, there is potential to install total capacity if 140 MW in 100 locations and for 20, out of 100, concession has been already given. However no SHPP has been constructed in these locations up to date.

Private operation of small HPPs in Albania began in 1999 with the enactment of the Law on privatization of state assets in the power sector. Privatization of small HPPs, which were previously operated by KESH, was started and undertaken by the Ministry of Economy and Privatization and the Albanian Privatization Agency, and were followed by the Ministry of Industry and Energy. Albanian Electricity Regulatory Entity (ERE) sets purchasing tariffs. New price for 2007 is 4,50 Lek/kWh (0.0350957 Euro/kWh). Tariffs applied by ERE are available on: http://www.ere.gov.al/en/index.htm. These tariffs are valid only for one year with a possibility of renewal. Commercial relations between KESH and private operators were established in 2002, and up to date several power purchase agreements were signed.

Legislative framework includes: (i) Law on privatization of local HPPs, No. 8527, dated September 23, 1999, amended with the Law No. 9470 dated 2/02/2006; (ii) Law on power sector No. 9072 dated 22/05/2003; (iii) Decision of the Council of Ministers on approval of the National Strategy of Energy, No. 424, dated June 23, 2003; (iv) Law on providing facilitating conditions for construction of new resources for power generation, No. 8987, dated December 24, 2002; (v) Decision of the Council of Ministers on approval of Transitional Electricity Market Model, No. 539, dated December 8, 2004, and (vi) Law on energy efficiency, No. 9379 dated 28/4/2005. The secondary legislation includes: (i) Electricity Market Rules of Albania, approved by ERE; (ii) Electricity Transmission Code of Albania, approved by ERE; (iii) Electricity Metering Code of Albania, approved by ERE and the Tariff

calculation methodology of power generation from independent power producers, which is under the drafting process. The Electricity Distribution Code of Albania has been drafted and is currently under the process of approval.

Biomass

In Albania, in the year 1980, the total amount of agriculture crop residues was around 800 toe, while in 2001, it was around 130 toe.

Energy potential of agricultural residues has been calculated to be approx. 43.004 GJ in the year 1995, while forestry biomass resources accounted for approx 460 millions of GJ in the same year. Data on forest resources are based on inventories made every 10 years from the General Directorate of Forests and Pastures. It has been estimated that total forest biomass resources reach some 125 million m^3.

Geothermal energy

Geothermal resources consist of thermal water springs and wells of low enthalpy (temperatures reach values of up to 60°C) which cover a wide territory from South, near the Albanian-Greek border to the Northeast districts in Diber region, and deep oil and gas wells, where there are thermal water fountain outputs with a temperature that varies from 32°C to 65,5°C. Kruja geothermal area is the zone, which has the biggest geothermal resources in Albania, with a length of 180 km and a width of 4-5 km. The most important resources explored until now are located in the northern part of the Kruja geothermal area, where the values of the specific reserves vary between 38,5 and 39,6 GJ/m^2.

Solar energy

Albania has a typical Mediterranean climate. Solar radiation is estimated to be on average 4 kWh/m^2/day, with a maximum of 4,6 kWh/m^2/day and a minimum of 3,2 kWh/m^2/day. According to radiation measures undertaken by the Albanian Institute of Hydrometeorology the global annual radiation varies between 3,2 kWh/m^2/day in the North East part of Albania and 4,6 kWh/m^2/day in Fier (the highest value), with a country average of 4,06 kWh/m^2/day. Therefore, Albania must be seen as a country with a good solar energy regime. Number of solar hot water units is approximately 3.000 in households sector (3.000/728.000 =0,41% rate of penetration). Also, today there are around 15 solar panel systems (big units) installed in Albania. There is no industry association, representing the manufacturing sector, in part because there is very little manufacturing capacity in the country. If Albania develops solar collectors systems on scale similar to Greece in per capita terms, the production of hot water would be equivalent to about 360 GWh (or 75 MW installed capacity). These figures corresponds to a total collector surface of about 400 thousand m^2 (0,5 m^2/family) and may be taken as indicative for Albanian market potential over the next 20 years.

Wind energy

There are no operational wind energy power plants and none known projects in planning. The most promising sites are located along the Adriatic coast, as well as on hills and mountain passes, but

also along the two big lakes at the Macedonian border. Estimated installed capacity: 50 MW. At the moment, there is no wind atlas available. Pre-feasibility studies have shown the highest wind speed zones are those on the seashore lowland. In these zones average speed of wind, throughout the year, is around 4-6 m/s (10 m height), and the average annual energy density of 150 W/m^2. According to the newly adopted energy strategy, feasibility study should be done for selection of the best sites of installation of wind power farms with total capacity of 100-150 MW in the future. In Albania conditions, it is estimated that by 2020, around 4% of the generated power can come from wind energy (some 400 GWh/year).

WASTE SECTOR

During the last 15 years, the problem of solid waste becomes an important issue in Albania due to the generation of large quantities of urban waste, as a consequence of rapid increase of urban population and the development of market economy. The main solid wastes produced in Albania are urban domestic waste, industrial waste and ho spital waste. The average composition of urban domestic waste for some cities shows high content of organic substances. The production of urban waste in Albania is estimated to be around 0,7 kg/person/day or 255 kg/person/year. The major five cities Tirana, Durres, Vlora, Shkodra and Elbasan, contribute with about 44% of the total production of urban waste, while Tirana, the capital, contributes with about 116.000 ton, or 22% of the total amount generated in the country. The country situation is characterized by the increase of the production of waste, which is estimated to reach the value of 1,1 to 1,2 kg/person/day towards 2010. At the same time, Albania is faced with the inappropriate management of urban wastes. The only way of waste disposal in Albania is dumping. Existing dumpsites do not have any drainage or waste compacting systems. The technologies used for final disposal of urban solid waste do not include differentiation of wastes and methane recovery and utilization systems. According to the Albania's First National Communication, the national GHG inventory for the base year 1994, pointed out that the share of waste sector to the overall GHG emissions from waste sector is 4,81% or 339,65 $ktCO_2$ equivalent. Estimates show that CH_4 and N_2O emissions released from waste category are 13,94 kt and 0,152 kt respectively. The main source of CH_4 emissions is agriculture sector which has a share of 77,74%, while the waste category contributes with a share of 13,60% to the total CH_4 emissions. The net annual CH_4 emissions are released by unmanaged landfills or dumpsites. According to the baseline scenario in 2020, the annual methane emissions from waste sector are expected to increase to 66,97kt or around five times more compared with the base year, 1994.

The main institutions responsible for the waste management in Albania, at the national level, are the Directorate for Pollution Prevention, the Directorate for Policies, Integration and Legislation, both in the Ministry of Environment, Forests and Water Administration, and the Environmental Institute. Then, the Ministry of Territorial Adjustment and Tourism for solid waste, the Ministry of Health for hospital waste, the Ministry of Industry and Energy for industrial waste and voluminous waste from industry, the Ministry of Agriculture and Food for agricultural and livestock waste and the Ministry of Transport and Telecommunication for end-of-life vehicles and used parts.

Legal issues within the sector are regulated by following set of legislation:

- Law on environmental protection, No. 8934, dated 05/09/2002;
- Law on environmental administration of solid waste, No. 9010, dated 13/02/2003;
- Decision of the Council of Ministers on the approval of rules and procedures for importation of waste for the purpose of use, processing and recycling, No. 803, dated 04/12/2003;
- Decision of the Council of Ministers on the approval of the Albanian List of hazardous Waste;

- Law on organization and functioning of local government (year 2000) requires the municipalities to be involved in management of urban waste (collection, transport, treatment and elimination) at local level. The Law on local taxes empowers municipalities to levy local taxes for cleaning the public space;
- Law on management of hazardous waste, No. 9537, dated 18/5/2006;
- Decision of the Council of Ministers on classification of waste according to approved categories, No. 99, dated 18/2/2005, based on Law on environmental administration of solid waste, No. 9010, dated 13/2/2003;
- Decision of the Council of Ministers on environment monitoring, No. 103, dated 31/03/2002.

In regard to the manure management, it contributes with 5,12% to CH_4 emissions from agriculture sector. After 90's, state livestock farms and agriculture cooperatives were privatized and therefore the livestock breeding shifted from intensive to extensive and this represents the main problem for development of economically attractive CDM project. The baseline scenario developed for the agriculture category predicts higher values of CH_4 emissions from manure management systems, nearly 10 times higher [40 kt] in 2020 compared to 1994 [4,08 kt]. Also the scenario predicts higher values (around 10 times) for N_2O emissions released from manure management systems. Anaerobic digester lagoon with methane gas recovery could be established in the coastal area of Albania where winter temperatures are mild, permitting anaerobic digestion all year around.

The administration of activities in agriculture falls under the Ministry for Food and Agriculture. The legal framework regarding the emissions into atmosphere released from the agriculture directly or indirectly is relatively recent. The most important legislation with respect to the manure management issues comprise following laws:

- Law on land, No. 7501, dated 19/07/1991;
- Law No. 7715, dated 2/06/1993 that introduce changes and additions to the Law No. 7501;
- Law No. 7763, dated 25/10/1993 that introduce changes and additions to the Law No. 7501;
- Law No. 7855, dated 29/07/1994 that introduce changes and additions to the Law No. 7501;
- Law No. 8752 dated 26/03/2001, related to creation and operation of land protection and administration structures;
- Law on water resources, No. 8093, dated 21/3/1996 and respective bylaws;
- Law No. 8375, dated 15/07/1998 that introduce changes and additions to the Law No. 8093;
- Law No. 8605, dated 20/04/2000 that introduce changes and additions to the Law No. 8093;
- Law No. 8736, dated 1/02/2001 concerning some changes and additions to the Law No. 8093;
- Law on regulatory framework on water supply sector and removal/treatment of waste waters, No. 8102, dated 28/03/1996;
- Decision of the Council of Ministers on allowed norms on liquid discharges and zones criteria of host water habitat, No. 177, dated 31/3/2005.

LAND USE LAND USE CHANGE AND FORESTRY

Albania's forests cover 1.030 ha, roughly 36% of the total land area, whereas pastures covers 14%. Natural forests have a share of 91,2% of the total forest cover. The total pasture area at the moment is estimated at 415.900 ha and 60% of pastures have been transferred to communes for use. The main objective of the decentralization of forests and pastures management was to transfer the state forests and pastures, as well as their management competencies, to the local government units for use.

There were no changes in the use of the agricultural area at the national level during the year 2002. The agricultural land fund has remained unchanged for the last ten years. However, around 50% of agriculture land, which is situated higher than 300 m from the sea level, is very fragmented, with stones, with very few potential capacities for irrigation, it is salted, eroded and with little feeding possibilities. There are around 120.000 ha of abandoned agricultural lands. Despite of reforestations, the share of forests has been decreasing in the past 50 years because of deforestation made in order to enlarge the share of arable land. It was also impacted by the change in definition on "forest" that allowed large part of forest area to be included in pastures. Annual growth, despite relatively favorable growing conditions stands at about 1,34 m^3/ha/year.

Primary responsibility for the administration and development of the forestry and pasture rests with the DGFP that is directly under the Ministry of Environment. Under the DGFP, a Commission is established, in charge of giving licenses for participating in the timber auctions to private and public entities.

Albania's forest area is composed mainly of the broad-leaf species, but estimations from Albania's FNC show that forests do not serve only as a sink but also as a source of GHG emissions, due to the bad management. Wood cutting in Albania is higher (over three times) than annual increment of forests and the biggest contribution comes from illegal cutting. The CO_2 emissions from biomass burned for energy purposes contribute with 21,4% to the emissions coming from LULUCF sector. It is still common practice in the rural area to use wood to meet the demand for space heating, cooking and hot water supply in the households.

The predicted reforestation area is about 15.000 ha, with an average rate of reforestation about 775 ha/year. However, total area suitable for plantation or natural revegetation, eligible for the CDM activities, has been estimated to be 1.765.845 ha. Implementation of the coppice forest conversion, in the forest area of around 100.000 ha, currently is being conducted with an average annual rate of 5.000 ha/year.

Legal framework in this sector includes:

- Law on Forest and Forest Service, No. 9385, dated 4/5/2005;
- Law on pasture and meadows, No. 7917, dated 13/4/1995;
- Decision of the Council of Ministers on the National Development Strategy for institutional reform on forest and pasture sectors, No. 247, dated 23/4/2004;

- Decision of the Council of Ministers on approval of the National Strategy on fire protection of forests and pastures, No.290, dated 30/4/2004;
- Law No. 9533, dated 15/5/2006 that introduce changes and additions to the Law No. 9385.
- Law on changes and additions to the Law on Forest and Forest Service, No. 9385, dated 4/5/2005, No. .9791, dated 23.7.2007

ASSESSMENT OF THE PROJECTS' POTENTIAL

Specific credit generating project opportunities

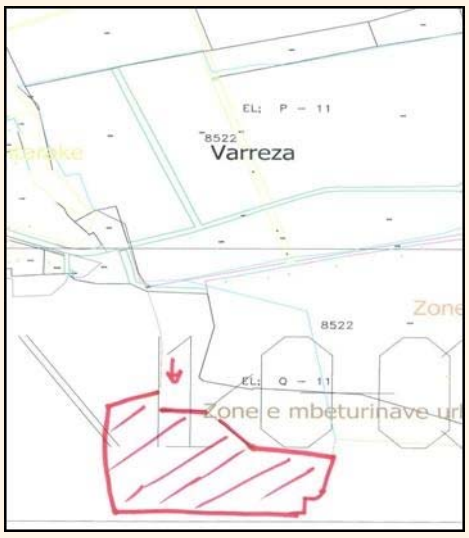
The tables in this chapter present specific credit generating opportunities in Albania. An initial summary table providing a general overview is followed by project specific descriptions.

SUMMARY TABLE

	PROJECT TITLE	REDUCTION [tCO_{2eq}] 2008 – 2018	PARTNERS	STATUS
	WASTE MANAGEMENT AND MANURE TREATMENT			
1.	**DURRES DUMP SITE GAS RECOVERY AND FLARING**	**127.000**	Municipality of Durres	Pre-feasibility
2.	**ELBASAN DUMP SITE GAS RECOVERY AND FLARING**	**81.000**	Municipality of Elbasan	Pre-feasibility
3.	**VLORE DUMP SITE GAS RECOVERY AND FLARING**	**65.000**	Municipality of Vlore	Pre-feasibility
	RENEWABLE ENERGY			
4.	**SHPP ZALLI I BULQIZES**	**118.000**	Local private company Teodori Sh.p.k. Ministry of Economy, Trade and Energy	Pre-feasibility
5.	**SHPP LURE 1,2,3**	**250.540**	Local private company ERDAT Sh.p.k. Ministry of Economy, Trade and Energy	Project concept
	ENERGY EFFICIENCY			
6.	**ENERGY EFFICIENCY IN THE BALLSH REFINERY OF ARMO (ALBANIAN REFINERY MARKETING OIL COMPANY)**	**700.000**	The Ballsh Refinery of ARMO (Albanian Refinery Marketing Oil Company)	Pre-feasibility
7.	**ENERGY EFFICIENCY IN THE STEEL FACTORY IN ELBASAN**	**588.000**	Kurum Steel Factory, Elbasan International Company	Energy audit Pre feasibility

8.	**ENERGY EFFICIENCY IN THE ELECTRICITY DISTRIBUTION AREA OF KUCOVA**	**174.000**	Kucova Distribution Zone, KESH (Albanian Power Company); Kucova - Albania	Pre-feasibility
9.	**CHP IN THE UNIVERSITY HOSPITAL CENTER**	**71.720**	Mother Tereza University Hospital Center; Ministry of Health, Republic of Albania	Energy audit Pre feasibility
10.	**ENERGY EFFICIENCY IN THE UNIVERSITY DORMITORY CENTER IN TIRANA**	**67.700**	Student City – Rr. Pjeter BUDI, Tirane; Ministry of Education and Science	Energy audit Pre feasibility
	CARBON SEQUESTRATION			
11.	**REFORESTATION IN KUKES DISTRICT**	**Up to 2.084.000**	Directorate of Forestry and Pastures Policies, Ministry of Environment, Forestry and Water Administration	Project concept

Project title Ref. No.1	**DURRES DUMP SITE GAS RECOVERY AND FLARING**
Project description	The objective of the project is to extract, collect and flare the LFG from Durres dump site, thus converting its methane content into CO_2 and reducing its GHG effect. The project baseline is the amount of methane that would be emitted from the dump site to the atmosphere during the crediting period, in the absence of the CDM project activity. Dump site Porto Romano was opened at 1998 and is situated 10 km north-west from the city of Durres in the wetland, covering 5 ha. The dump site serves around 180.000 inhabitants and receives almost all MSW of the Municipality of Durres or 120 tones per day. Almost all waste going to dump site is composed of urban domestic solid waste with a high organic content. Disposal site does not have any system to protect groundwater against leaching of hazardous substances. Currently, LFG collection is not carried out on the Durres dump site, so the LFG and its methane content are released to the atmosphere. The dump site is about to be closed. The project activity requires an investment in a gas recovery and collection system together with equipment for LFG flaring. The system and equipment will be composed of vertical collection wells, horizontal gas collection pipes, gasholders, measuring instruments, blower and LFG flaring module. Dumping is practically the only way of MSW management without any previous treatment aimed to the environmental protection in Albania. Public utility that manages the dump site, doesn't possess the technical know-how, human resources, and financial sources to implement LFG collection and flaring on the dump site. Legislation requiring mandatory collection of LFG from the dump site doesn't exist either in legal framework the Republic of Albania or in the legal framework of the Municipality of Durres. The only requirement is to vent the LFG in order to avoid the risk of explosion.
Applied methodology	AMS. III.G – ***"Landfill methane recovery"***
GHG offset	It is estimated that the project has a capacity to reduce GHG emission of nearly ***127.000*** tCO_{2eq} for the period 2008 – 2018.
Sustainability	The project itself recognizes non-GHG related environmental benefits, identified as follows: • The project will increase the safety at the dump site, due to reduced risks for explosion or poison from uncontrolled migration of LFG; • The project will reduce obnoxious smells inside and outside the dump site area; • Providing of employment opportunities at the dump site during the construction of gas flaring plant; • The project might have additional positive effect with respect to wetland restoration as an important and growing environmental field.
Current status	Specific technical information through questionnaires and site visit have been collected and the local site owner agrees on the project implementation.
Estimated investment cost	Total investment needed is approximately 600.000 €.
Local partners	Municipality of Durres

Project title Ref. No.2	**ELBASAN DUMP SITE GAS RECOVERY AND FLARING**
Project description	The objective of the project is to collect and flare the LGF, thus converting its CH_4 content into CO_2 and reducing the GHG effects. The project baseline is the amount of methane that would be emitted from the dump site to the atmosphere during the crediting period, in the absence of the CDM project activity.  The Elbasan dump site has been operational since 1985. The dump site covers an area of 35 000 m^2 and receives almost all MSW of Municipality of Elbasan. The amount of MSW carried into dump site is estimated at 75 tones per day. Almost all waste going to dump site is composed of domestic household solid waste. This disposal site does not have any system to protect groundwater against leaching of hazardous substances. Currently, LFG collection is not carried out and that is the reason why LFG is released to the atmosphere. The project requires an investment in a gas collection system and equipment for LFG flaring. The system and equipment will be composed of vertical collection wells, horizontal gas collection pipes, gasholders, measuring instruments, blower and LFG flaring module. Public utility that manages the dump site, does not possess the technical know-how, human and financial resources to implement LFG collection and flaring on the waste disposal site. Legislation requiring the mandatory collection of LFG sites doesn't exist either in legal framework the Republic of Albania or in the legal framework of the Municipality of Elbasan. The only requirement is to vent the dump site gas in order to avoid the risk of explosion.
Applied methodology	AMS. III.G – ***"Landfill methane recovery"***
GHG offset	It is estimated that the project has a capacity to reduce GHG emission of nearly ***81.000*** tCO_{2eq} for the period 2008 – 2018.
Sustainability	The following non-GHG related environmental benefits have been identified as a result of the project: • Landfill site odour, fire and explosion prevention • Short-term employment creation effect through project realization
Current status	Specific technical information through questionnaires and site visit have been collected and the local site owner agrees on the project implementation.
Estimated investment cost	Total investment needed is approximately 600.000 €.
Local partners	Municipality of Elbasan

Project title Ref. No.3	**VLORE DUMP SITE GAS RECOVERY AND FLARING**
Project description	The purpose of the project activity is to implement an LFG recovery and flaring system at the dump site, in order to reduce CH_4 emissions for the benefit of global climate and thus to generate CERs. The baseline for this project activity is the amount of methane that would be emitted from the dump site to the atmosphere in the absence of the project activity. The dump site was open during 1960's and it is situated about 2 km away from the town. It covers 6,5ha and serves around 114.000 inhabitants. The amount of MSW carried into the dump site is estimated to be around 60t per day. Almost all waste going to the dump site is composed of domestic household solid waste. This disposal site does not have any system to protect groundwater against leaching of hazardous substances. Currently LFG collection is not carried out, so the LFG is released to the atmosphere. The project requires an investment in a gas collection system and equipment for LFG flaring, which will be composed of vertical collection wells, horizontal gas collection pipes, gasholders, measurement equipment, blower and LFG flaring module. Public utility that manages the dump site, does not possess the technical, human and financial resources to implement LFG collection and flaring on the dump site. Legislation that requires mandatory collection of LFG from dump site sites doesn't exist either in legal framework of the Republic of Albania or in the legal framework of the Municipality of Vlore. The only requirement is to vent the LFG gas in order to avoid the risk of explosion.
Applied methodology	AMS. III.G – ***"Landfill methane recovery"***
GHG offset	It is estimated that the project will reduce app. ***65.000*** tCO_{2eq} for the period 2008 – 2018
Sustainability	The following non-GHG related environmental benefits have been identified as a result of the project: • The project will increase the safety on the dump site due to reduced risks of explosion or poisoning through an uncontrolled migration of LFG, • The project will result in reduced pollution of ground water resources due to promotions of capping activities, • The project will reduce obnoxious smells inside and outside the dump site area, • The project will provide employment of staff during the construction.
Current status	Specific technical information through questionnaires and site visit have been collected and the local site owner agrees on the project implementation.
Estimated investment cost	Total investment needed is approximately 600.000 €.
Local partners	Municipality of Vlore

Project title *Ref. No.4*	**SHPP "ZALLI I BULQIZES"**
Project description	The objective of the SHPP Zalli i Bulqizes project activity is to generate renewable electricity using hydroelectric resources and to sell the generated output on the basis of power purchase agreements (PPAs), using the Distribution Network of Albanian Power Utility (KESH). The project activity will generate GHG emission reductions by avoiding electricity generation, and CO_2 emissions, from fossil fuel-fired power plants that would be generating the same amount of electricity otherwise. This hydropower plant, located on the Zalli Bulqizes River, is of derivation type utilizing the differences of level of water's fall. This technology utilizes waters of natural resources with high energy potential of Zalli Bulqizes River, or other water works, without changing the physical-chemical features of water and without damaging ecosystem balances in the area where the plant will be built. There is already existing water channel "Zalli Bulqiza", constructed at the same time as Ternova's lake, for irrigation's purposes. Water supply to this channel comes from Zall Bulqiza, in place called "Ura e Qytetit" (City Bridge). The channel uses waters of Zall Bulqiza during the period of June-August and it is constructed with conducted capacity of 1,5 m^3/sec. The channel goes till the place where the powerhouse is ought to be located. Its length is 7,5 km for option H=85 m, and 10 km for option H=110 m. The slopes vary from 0,001 to 0,002. The state of channel is currently very bad, because for over 12 years, there hasn't been any maintenance work done and it is almost out of usage. The interventions are necessary not only to improve its current condition, but also to increase the capacity, and existing demand for electricity. It should be underlined that with relevant interventions on the channel, no interruptions of irrigation are foreseen. At the same time, through its improvement the channel basin would be conserved, the conductor's capacity increased and the endurance elevated. The time of using water for the electricity production is October-June of each year, and the rest of period is utilized for irrigation. Hydrological, hydromechanics, energy and pre-feasibility studies have defined the best solution for constructing Zalli Bulqizes SHPP with those parameters: Average Inflow: Qllog — 6,90 m3/s Average Inflow: Qmin — 0,72 m3/s Gross Head — 91,35 m Net Head — 90,60 m Capacity — 5.350 kW Annual Electricity Generation — 25.117.930 kWh
Applied methodology	AMS-I.D – ***"Renewable electricity generation for a grid"***
GHG offset	It is estimated that the project has a capacity to avoid emission of approximately ***118.000*** tCO_{2eq} for the period 2008-2018.
Sustainability	Aside from the global environmental benefit of GHG emissions abatement, the project would significantly improve the quality of electricity service in the Bulqiza region, as well as the

	quality of water supply. Furthermore, since a major problem in the region is lack of access to electricity, rural electrification of local communities would be a great local benefit. The project would also provide employment to local people, both during the SHPP construction and operation, in the area where permanent and reliable positions are scarce.
Current status	Specific technical information through questionnaires and site visits have been collected and the concessionaire Teodori Sh.p.k. agrees on the project implementation.
Estimated investment cost	The preliminary estimated investment cost is 5,5 millions EUR.
Local partners	Teodori Sh.p.k - Local company; Ministry of Economy, Trade and Energy.

Project title *Ref. No. 5*	**SHPP LURE 1,2,3**
Project description:	This project activity comprises three bundled SHPP locations: Lura 1,2,3 on Lure river, with total installed capacities of 10.993 kW and with an average annual electricity generation of app. 53 GWh. SHPPs Lure "1", "2" and "3" would operate in a cascade regime using the energy of Molla Lure river in Dibra town. This watercourse is a tributary of Drini river and flows in Lura area around 50 km in north-east of Peshkopia city. From the energetic point of view, the height difference between first and third cascade could be of around 500 m. All hydro powers would be derivation type, with no dam or flooding, and thus with very little environmental impact. The production of the electrical power is guaranteed for the entire year. The parameters for any stations are: ***Lura 1*** Average discharge: Qm 1,6 m3/s Net head 342,5 m Installed capacity 4812,0 kW Electricity generation. 24.075.468, 0 kWh ***Lure 2*** Average discharge: Qm 1,19 m3/s Net head 246,5 m Installed capacity 2549,0 kW Electricity generation 10.961.419,0 kWh ***Lura 3*** Average discharge: Qm 3.96 m3/s Net head 105.6 m Capacity min. 3632,0 kW Electricity generation min. 18.271.377,0 kWh
Applied methodology	AMS-I.D – ***"Renewable electricity generation for a grid"***
GHG offset	The estimation of emission reductions is **25.054** tCO_{2eq}/year and **250.540** tCO_{2eq} for 2008-2018 Kyoto commitment period.
Sustainability	The following sustainable development criteria have been considered: • the project will considerably contribute to the sustainable development of the area of Municipality of Dibra by mitigating the negative effect of GHG emissions using renewable energy source for electricity generation and by creating new jobs; • the project will contribute to the improvement of the quality of life of local inhabitants by

	providing electricity to local households.
Current status	The described project activity has been defined according to data from the existing official documents such as strategies, technology needs, assessments and so on and the concessionaire ERDAT Sh.p.k agrees on the project implementation.
Estimated investment cost	The estimated investment cost is 12,5 millions EUR.
Local partners	ERDAT Sh.p.k - Local company; Ministry of Economy, Trade and Energy

Project title *Ref. No. 6*	**ENERGY EFFICIENCY IN THE BALLSH REFINERY OF ARMO (ALBANIAN REFINERY MARKETING OIL COMPANY)**
Project description:	The objective of the proposed project activity is to reduce GHG emissions by introducing different energy efficiency measures to the Ballsh Refinery of ARMO (Albanian Refinery Marketing Oil Company). The emission reductions are ought to be achieved by increasing energy efficiency through reducing heavy fuel oil and electricity consumption in the oil chain industry with a very high energy intensity. The Ballsh and the Fier are currently the only operating refineries, but due to some difficulties, e.g. decline in crude oil production, only 30% of their capacity is operational. The Ballsh refinery, commissioned in 1978, is the only complex refinery in the country that is composed of old plants, which produce a large range of oil by-products. Although the refinery was built in 1978, the technology used dates from '60. It should be underlined that the parameters for many technological processes, such as oil desalination or water cleaning, do not comply with the environmental requirements and there is an evident need for rehabilitation of the refinery. At the moment, there are only two TPPs in the country operating partly as cogenerations plants: the Fier and the Ballsh. The TPP Ballsh has two units with a total installed capacity of 24 MW and about 65 MW. The Ballsh power plant hasn't been producing electricity for the grid since 1996. It only serves the nearby refinery. Both power plants are old and in very poor operating conditions. The maximum continuous power outputs of generating units are significantly lower than their rated power. The refinery electricity consumption last year was 46 GWh/year and therefore ERE gave to Albanian Refinery Marketing Oil Company sh.p.k status of eligible customer. However, the company still hasn't taken the advantage of this status. The Refinery commenced operations in 1978. The theoretic processing capacity is estimated to be around 1.000.000 tons of crude oil per year. The refinery is made up from the following units: 1. Atmospheric distillation unit 2. Hydrogen production unit 3. White products hydro-cleaning unit 4. Catalytic reforming unit 5. Gas filtration and sulphur production unit 6. Oil gas filtration unit The main outputs produced are: Gas oil (accounts for 28% of production), Coke Coal (15.6%), Gasoline (11%), Solar Fuel (14%), Masut (11%). Actually the refinery is operating in reduced capacity due to lack of raw material. In order to achieve technical readiness for full capacity realization, continuous reparations and investment are necessary. For its activity, the refinery consumes: • Electricity, • Heavy fuel oil. The electricity consumption last year was 46 GWh and the amounts of HFO, used in the

steam generation for producing very high process heating, for the year 2005 were 65.000 ton.

Introducing the energy efficiency measures and CHP technology in the Ballsh Refinery, reductions of 22% in electricity consumption would be achieved. By improving burners in residual fuel oil furnaces, fuel consumption would be reduced up to 30 - 33%.

Possible energy savings measures which could be undertaken in the above mentioned units are as follows:

Improving Electrical Energy Efficiency and Improving Energy Efficiency of Burner Systems

Based in the preliminary estimations the improvement of electricity system could reduce electricity consumption by 10-12%. In order to optimize the burning process, control of O_2 flow rate and analyzer of waste gasses have been envisaged. The preliminary assessment showed that improvement of burners would reduce HFO consumption by 10-12%.

Thermal Insulation of all District Heating Pipes

The thermal energy is generated at the thermal power plant, which is currently working in the heat-only mode and it is being used for process heating needs of refinery. All the underground pipes are very bad thermally insulated and covered with concrete tiles. Thermal losses are enormous (the maximum accepted is 12-15 % for the networks of several km). So, by reducing thermal losses in the pipelines, 10-15% of energy savings could be achieved.

Rehabilitation of the Ballsh Refinery

During the period 1960-1980, Combine Heat and Power Plants (CHP) in Albania have been more developed than Heat-Only Boilers (HOB), which from their side are used only in hospitals, Student City, industry, institutional buildings and in any other small places.

The CHP Ballshi is a plant working in the heating only mode and provides heat only to the respective refinery. Through rehabilitation of this CHP, total electricity and fuel consumption would be reduced by 15%-20%.

Summary of energy savings and GHG reductions

As it was mentioned there are three groups of energy saving measures in the whole Ballshi Refinery. Total annual GHG emission reductions, which would result from these measures, accounts for 70.000 tons of CO_{2eqv} (Figure. 1).

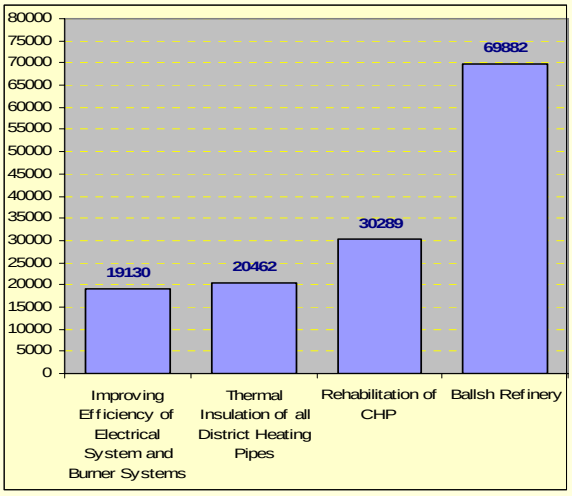


Figure 1. Annual GHG emission reduction in tons of CO2eqv

Applied methodology	The above mentioned energy saving measures could be divided in the two project activities. First one could be the bundling of two first measures: improving efficiency of electrical energy consumption and thermal insulation of all district heating pipes, and second rehabilitation of existing CHP plant. Therefore, in both cases the methodology for the small scale project **"*Energy efficiency and fuel switching measures for industrial facilities*"** II.D could be applied.
GHG offset	It is estimated that the project has a capacity to avoid emission of app. ***700.000*** tCO_{2eq} for the period 2008-2018 (with the steady production intensity).
Sustainability	The project will contribute to sustainable development of the local area by mitigating negative effects related to high energy consumption and GHG emissions per unit of production, through increased energy efficiency in the refinery.
Current status	Specific technical information through questionnaires and site visit have been collected and the local site owner agrees on the project implementation. This one could be divided in more than one project activity
Estimated investment cost	NA
Local partners	The Ballsh Refinery of ARMO (Albanian Refinery Marketing Oil Company)

Project title *Ref. No. 7*	**ENERGY EFFICIENCY IN THE STEEL FACTORY IN ELBASAN**
Project description:	Kurum Elbasan Steel currently operates with Electric Arc Furnace (EAF) technology, smelting ferrous metal scrap. Globally, scrap supply moves into difficult times, a situation that puts Elbasan Steel and similar factories in vulnerable situation since there is no more adequate scrap in Albania to operate the factories at full capacity. The company has invested in leveling off environmental pollution, but the steel plant, in the long run, must shift to modern technologies and less-scrap, more pig iron or sponge iron in order to survive. Previously, Elbasan Steel was incepted as an integrated plant processing iron and ferro-nickel. In that respect, there is abundant ferro-nickel, and titano-magnetite resource in Albania that is given for utilization to Kurum Elbasan Steel, located 90km from Durres. The reserves have shown to be promising, together with available coal that would yield as much as 6,000kcal. Primary objective of Steel Factory at Elbasan is to increase production while retaining the environmental hazards at lowest possible levels. Up to date, the factory spent around 7.5 million USD for the measures to decrease environmental pollution, and by September 2007 it is planned to complete the optimization of the filtering system. The objective of the proposed project activity is to reduce GHG by introducing different energy efficiency measures. By increasing energy efficiency in the industry of high energy intensity, the project will generate GHG emission reductions, which would come from reductions in heavy fuel oil and electricity consumption. The annual steel production in the years 2003, 2004 and 2005 was 86.120, 96.103 and 123.055 tons of steel, respectively. As an example, a 60-tons Electric Arc Furnace consumes approximately 800,000 kWh/day of electricity to produce steel billets through continuous casting. Three graphite electrodes conduct the electrical current and form the arc for the metallic charge. The high temperatures facilitate the melting of every steel grade irrespective of the charge (scrap, sponge iron, hot metal or any related mixture). Due to the utilization of electric arc furnace technology, the electricity consumption is growing steadily. Given that the electricity consumption last year was 212 GWh/year, the ERE gave to Kurum International sh.p.k. status of eligible customer. The company, however, hasn't exercised yet this status effectively. Therefore, the company has to take very fast actions to reduce the cost of energy by increasing energy efficiency. The factory consumes: • Electricity, • Heavy fuel oil (HFO). • Electricity (used widely in the arc furnace). The annual electricity consumption of Kurum Factory in the years 2003, 2004 and 2005 was 61,44, 104,33 and 156,71 GWh, respectively. The average annual HFO consumption for the industrial processes in the years 2003, 2004 and 2005 was 5.050, 6.025 and 9.330 tons, respectively. The average annual coke consumption for the same period was 2.280, 3.000 and 3.750 tons, respectively. Different energy efficiency measures and introduction of new arc technology could reduce electricity consumption by 25-28%. By improving burners of residual fuel oil, furnace fuel consumption could be reduced up to 20-23%.

Based on the market research, the Directly Reduced Iron (DRI) technology could be the best solution in the case of Kurum Elbasan Steel.

The advantage of this technology is that the minerals with iron ore could be reduced by using the local coal (or imported coal). The output would be sponge iron or pig iron that could be used in the Electric Arc Furnace, together with scrap, to minimize GHG emissions. Through such technologies, not only standard steel, but stainless steel and ferro-titan could also be produced in the Elbasan Steel Factory.

The possible energy savings measures, which could be undertaken, are listed below.

Steel mill

In this unit, the change of the electric arc furnace and burner system has been envisaged. The improvement of electricity arc could reduce electricity consumption by 22-25%. In further calculations, the lower estimation of 22% has been taken into account.

In order to optimize the burning process, control of O_2 flow rate and analyzer of waste gasses have been envisaged. This will result in decrease of the HFO consumption. It is expected that improvement of burners would reduce electricity consumption by 20-23%. In further calculations, the lower estimation of 20% has been taken into account. Final calculation shows that annual GHG reductions in the steel mill could be 37.000 tCO_{2eqv}.

Rolling mill

In this part of the Kurum complex, the main energy saving potential is related to the optimization of the burning process, which could be achieved through changing 17 burners in the process furnace and reusing of the high temperature waste gasses. This would result in the decrease of HFO consumption, as well as O_2 necessary for the burning. Since the distance between steel and rolling units is almost 500m, the heat losses are significant, as the blades have temperature of app. 560^oC after the melting process. In regard to this, the losses could be reduced by designing the most optimal transport of the blades from one unit to another. Under these circumstances, the blades are completely cooled before entering in the furnace, where the temperature reaches 1.100^oC.

It has been estimated that improvement of electric efficiency could reduce electricity consumption by 10-13% in the rolling mill. In further calculations, the lower estimation of 10% has been taken into account. Energy efficiency, due to transportation of blades in the thermal insulation “package” and due to increasing efficiency of burners, could result in reduction of consumption by 50-55%.

Final calculation shows that annual GHG emission reductions in the rolling mill could be 20.420 tCO_{2eqv}.

Lime production unit

In this process unit exists the possibility to optimize the shaft furnace for melting limestone and coke, as well as to change the rotating system of the furnace’s bottom. This would result in the decrease of coke consumption, as well as in decrease of electricity consumption.

The improvement of energy efficiency could reduce electricity consumption by 10-12% in the lime production unit. In further calculations, the lower estimation of 10% has been taken into account. Energy efficiency, due to improvement of burning process of coke, would result in the consumption reduction of 22%. Final calculation shows that annual GHG emission reductions in the lime production unit could be 1.400 tons of CO_{2eqv}.

Summary of energy savings and GHG reductions

As mentioned before, there are three groups of energy efficiency measures which need to be undertaken, in order to obtain optimal electricity and fuel savings and GHG emission reductions. Total annual GHG emission reductions are shown in the Figure 2.

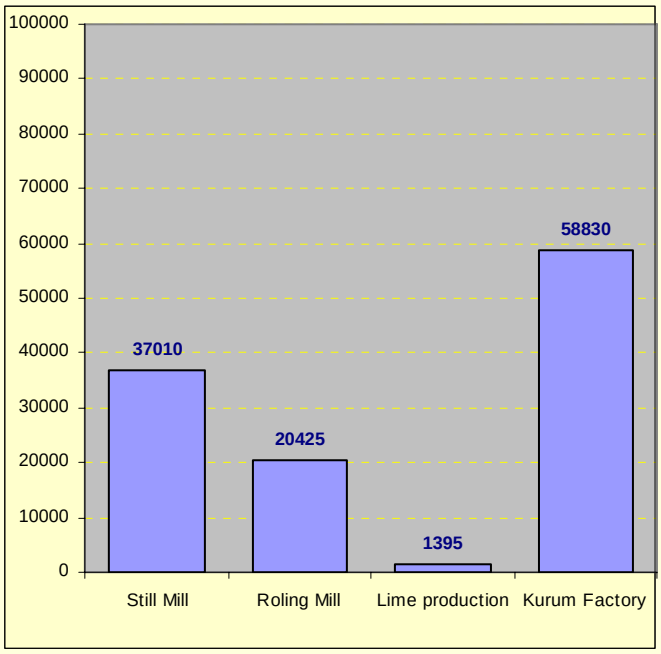


Figure 2. Annual GHG emission reduction in tons of CO2eqv

Applied methodology	The project activity is small-scale energy efficiency project, with the total saving less than 60 GWhe (180 GWh_{th}) . The estimation of the emission reduction could be calculated by using the simplified methodology for small scale projects ***"Energy efficiency and fuel switching measures for industrial facilities"*** II.D.
GHG offset	It is estimated that the project has a capacity to avoid emission of app. ***588.000*** tCO_{2eq} for the period 2008-2018 (with the steady production intensity).
Sustainability	The project will considerably contribute to sustainable development by mitigating the negative effects which are at the present are very high, due to intensive energy consumption and GHG emissions per unit of production.
Current status	The Elbasan metallurgy complex, operated by Kurum International sh.p.k, will very soon expand its capacity, diversify production and continue with investments related to environmental protection. Kurum International sh.p.k is working to achieve the objective of producing 600.000 tons of steel per year and annual exportation rate of 250.000 tons of steel.
Estimated investment cost	According to the preliminary assessment done by Kurum the total investment costs for all measures defined above can be up to 64 millions EUR.
Local partners	Kurum International Sh.p.k

Project title
Ref. No. 8

ENERGY EFFICIENCY IN THE ELECTRICITY DISTRIBUTION AREA OF KUCOVA

Project description:

The objective of the proposed project activity is to reduce GHG by introducing energy efficiency measures to the Distribution Area of Kucova that supplies electricity to different categories of consumers like households, service, industry and agricultural sector. By increasing energy efficiency in this distribution area, the project activity will generate GHG emission reductions through reducing electricity consumption in this zone.

Albanian Energy System in general and Kucova power network in particular is facing serious problems due to the insufficient development of the transmission system and the actually lack of rehabilitation and upgrading of the equipment during the last 15 years. This has considerably reduced the reliability of system operation and the quality of electricity supplied, and has limited the exchange capacity with neighboring countries. Technical losses in transmission networks accounts for around 9%. The main existing problems are the following:

- Overloading of several 220 kV transmission lines causes losses, lower voltage level than standard and load shedding;
- Lack of system flexibility and the inadequate operation, reduces the reliability and capacity of the transmission system;
- Lack of possibility to operate in an optimal way and non-balancing of the reactive power,
- Many assets of the 220/110 kV substations are old and during the last years the maintenance operations barely existed,
- Limitation of electricity exchange capacity with neighbouring countries,
- The old and inefficient communication means of controlling system.

Within the Distribution Area, the main cables and the main distribution system feeders are 6 kV, 10 kV and 20 kV. The distribution equipment is in a very bad condition due to the long working period. Extreme overload conditions, which are characteristic for the winter period with the high consumption of electricity for space heating, damage the distribution system. Technical losses in the distribution are very high and accounts for 16%.

Electricity consumption for the Distribution Area of Kucova, for the time period 1995-2005 is given in the following table:

Electricity Consumption for the Kucova Distribution Zone (GWh/year)										
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
GWh	254	261	273	282	294	311	319	327	336	343

Based on the strategy for reduction of technical losses, the distribution system plan of Kucova Region has been developed. Following are the measures identified:

- Gradual substitution of 35/10-6 kV system with 110/20 kV system, aiming to substitution of all 110/20 kV transformers at the end of the rehabilitation phase. This will reduce technical losses from 15,8% to 5%. At the same time, approx. 300 transformers with standardized characteristics 20/04 kV, 100 kVA will be constructed and placed in pillars in rural zones, resulting in reduction of technical losses. Existing transformers in urban zones will be modified from 10-6 kV to 20 kV and new standardized 20/04 kV ones will be adjusted with underground cables, with a capacity of 400 kVA, in order to have impact in reduction of technical losses;
- Installation of electric meters for all consumers categories.

Applied methodology	The estimations of the GHG reductions were done using the simplified methodology for small scale projects AMS-II.B. ***"Supply side energy efficiency improvements – transmission and distribution"***, since the electricity savings are less than 60 GWh.
GHG offset	It is estimated that the project has a capacity to avoid emission of approximately ***174.000*** tCO_{2eq} for the period 2008-2018.
Sustainability	The project contributes to the sustainable development by increasing efficiency in the electricity distribution and by mitigating negative effects of technical and non-technical distribution losses.
Current status	Specific technical information through questionnaires and site visit have been collected and the local site owner agrees on the project implementation
Estimated investment cost	Total investment needed for reduction of technical losses is approximately 7.5 millions EUR.
Local partners	Kucova Distribution Zone, KESH (Albanian Power Company); Municipality of Kucova - ALBANIA

Project title *Ref. No. 9*	**CHP IN THE UNIVERSITY HOSPITAL CENTER**

Project description:

The University Hospital Centre “Mother Teresa” in Tirana has 28 buildings and represents the biggest hospital centre in Albania.

The general layout of University Hospital Centre “Mother Teresa” - Tirana and the heat distribution network are shown on the following Figure 3.

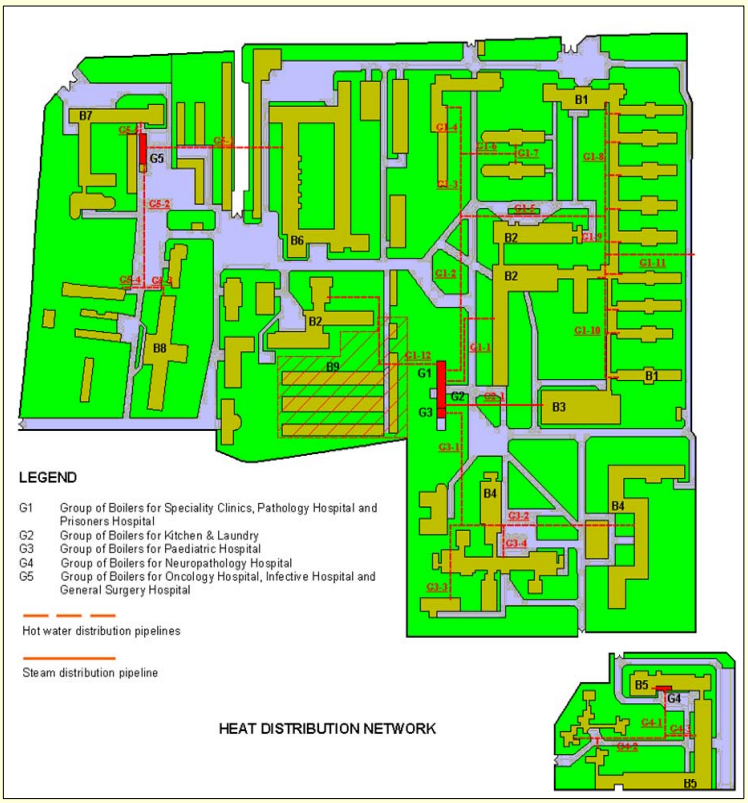


Figure 3. Hospital-Centre-boiler houses and Heat-network

This hospital centre is established in 1925 and it has had continuous extensions since that time. It should be mentioned that although the number of hospitals has been increased continuously, its infrastructure, i.e. the distribution networks for drinkimg water, sewerage, power, hot water for showers and space heating of all hospital buildings, has remained the same as of the years of ‘40. It should be underlined that in the extensions plans of the University Hospital Centre “Mother Teresa”, the construction of a new six-floor hospital is under the tendering process. The new hospital will be financed under a French government grant. During the analyses of future energy needs, it should be also taken into consideration energy required in the new part of the hospital center.

The objective of the proposed project activity is to reduce GHG by introducing different energy efficiecy measures at the Mother Tereza University Hospital Center. The monthly average number of patients for the years 2003-2006 is 6.995, 6.845, 6.800 and 6.855, respectively. The number of employed personnel for all units in the hospital center is in total 1.695 taking into account doctors, paramedics, sanitary and administrative personnel.

The consumption of energy sources in the University Hospital Centre is made for providing the following main services: space heating, cooking, lighting, hot water preparation for showers

and the laundry, air conditioning and domestic appliances such as TVs, tape recorders, refrigerators, etc.

The hospital center during its activity uses electricity, residual fuel oil and LPG for cooking in kitchen.

The annual average energy consumption in the hospital center for the period 2003-2006 was:

Electricity – 8.800, 9.400, 9.900 and 10.600 MWh, respectively;

Residual fuel oil – 3.420, 3.660, 3.760 and 3.960 tons of residual fuel oil, respectively;

LPG – 20.450, 20.810, 21.410 and 21.170 kg, respectively.

The potential energy savings measures, which could be undertaken in the Mother Tereza University Hospital are as follows:

Space Heating: Thermal Insulation of all Buildings and Introduction of Double Glass Windows

In the Eastern and Central Europe (including Albania), the energy consumption for space heating in the residential and public buildings is often 2-3 times higher than the similar buildings in the Western Europe, what means that the energy consumption for electricity and space heating is in the range of 250-400 kWh/m^2 per year.

Increasing the thermal insulation level and reducing the losses from natural and mechanical ventilation, one can reduce greatly the energy consumption in the buildings of the Mother Teresa hospital center. If a building should be renovated, e.g. replacement of old windows, roof improvement, etc, it is reasonable to combine these steps with energy efficiency measures, because the energy consumption reduction can shorten the turn-over period. Apart from reduction of energy consumption, the thermal improvement can increase also the lifespan of the building and, at the same time, reduce the emissions into the atmosphere from fuel burning.

The possible annual GHG emission reductions, by implementing the above mentioned measures, could be up to 2.030 tons of CO_{2eqv} per year and could decrease electricity and residual fuel oil consumption.

Space Heating: Thermal Insulation of all District Heating Pipes

The thermal energy for heating all the hospitals and clinics of the University Hospital Centre “Mother Teresa” is generated at so called Boiler Houses. Connected to the Boiler Houses, there are about 2.500 m of primary pipeline (hot water distribution pipeline), secondary pipeline (networks that connect the buildings with the distribution pipeline) and the internal pipeline networks, which sent the hot water into radiators. The overall length of the mentioned pipelines is approximately 22 km. All the underground pipes lay in ducts paved in brick wall and held by metal supports, thermally insulated and covered with concrete tiles. It is to be said that after 50 years of work, these pipes are in very bad condition, so even the water of 90 ºC generated in the boilers reaches the consumer (distant not more than 1km) with the temperature not higher than 40-50 ºC.

Simple calculations show that losses from the hot water network reach 50-60% of the demand for thermal energy. So, by reducing thermal losses in these pipelines, energy saving of 15-20% could be achieved. Energy saving in electricity and in residual fuel oil could be 486 MWh and 327 tons, per year, respectively. The possible GHG emission reductions could reach the value of 1.150 tons of CO_{2eqv}/year.

Space and Water Heating: Introduction of CHP System

Space heating of the hospitals and clinics included in the University Hospital Centre is provided from five different Boiler Houses. Each of these boiler houses is separate from one another without taking into account a proper energy plan. Space heating of all hospitals and clinics included in the University Hospital Centre is provided during the period 22 November-28 March of each year and currently is in very bad condition.

Therefore, the introduction of the CHP system will have a worthwhile overall advantage, resulting not only to energy saving but to quite relevant value of the GHG emission reduction. The preliminary possible scheme of the CHP system in the Mother Teresa hospital has been shown in the following figure.

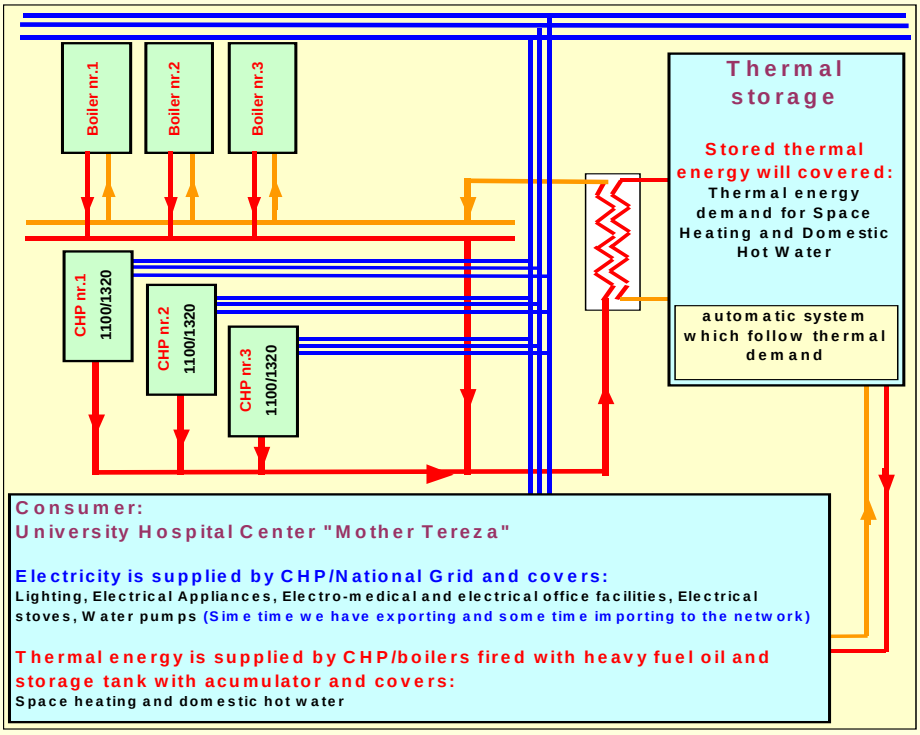


Figure 4. The possible scheme of CHP system

The possible GHG emission reductions in this case could reach the value of 3.491 tons of CO_{2eqv}/year.

Introduction of Efficient Lighting

Another energy efficiency measure, which could be undertaken in this hospital center, is introduction of new energy efficient lighting system. For the specific lighting intensity, the required power depends on the lighting equipment efficiency (types of lamps, incandescent or fluorescent etc.), on designed lighting system and proposed regime for maintaining the system. In the clinics, and other buildings of University Hospital Centre ”Mother Teresa”, the calculations related to electricity consumption for lighting are based on the number of lamps in each building, the average lamp power, and the average time of their operation, during the summer and winter periods.

It should be underlined that the highest energy consumption for lighting is during winter months and the lowest consumption is during summer months. By replacement of the existing 60W incandescent lamps with 18W fluorescent lamps, which have a lifespan of 1.000 hours and

8.000 hours, respectively, the annual reduction of 256 tons of CO_{2eqv} could be achieved.

Introduction of Efficient Equipment

Old electrical equipment in the hospital can be replaced by introducing efficient technologies. Those technologies would bring energy savings of 511 MWh per year, as well as reductions of 245 tons of CO_{2eqv} per year.

Summary of energy savings and GHG reduction from all measures

As mentioned previously, there are three groups of energy savings in the whole hospital. Those measures will be bring electricity and fuel savings, related to space and water heating and lighting, as well as GHG reductions. Total annual GHG emission reductions could be 7.172 tons of CO_{2eqv} (see the following figure).

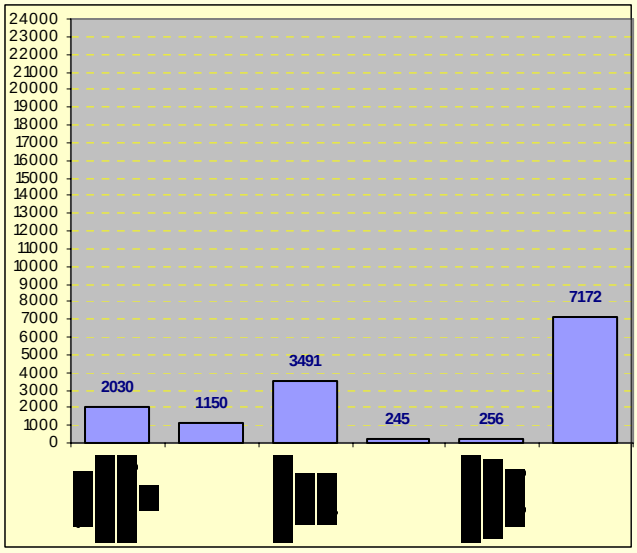


Figure 5. Annual GHG emission reductions in tons of CO2eqv

Applied methodology

The project activity is a small-scale energy efficiency project, with the total saving less then 60 GWh of electricity per year. Estimation of the emission reduction could be calculated by using the simplified methodology for small scale projects ***"Energy efficiency and fuel switching measures for buildings"*** II.E.

GHG offset

It is estimated that the project has a capacity to avoid GHG emission of app. **71.720 tCO_2eq** for the period 2008-2018.

Sustainability

The project will contribute to the sustainable development by mitigating the negative effects, which are at present very high due to high energy consumption and GHG emissions.

Other benefits that could be gained through implementation of this project are as follows:

- Improvement of energy efficiency at national level,
- Reduction of technical losses and energy transportation cost through local electricity production,
- Reduction in environmental pollution,
- Increase of employment and upgrade of expertise through introduction of new

	technologies, • Increase of investments in public sector.
Current status	Energy Survey and Audit of Boiler Houses at the University Hospital Centre “Mother Teresa” has been performed.
Estimated investment cost	The assessment has shown the investment cost for all above mentioned measures of approx. 5,7 millions EUR.
Local partners	Mother Tereza University Hospital Center, Ministry of Health, Republic of Albania

Project title *Ref. No. 10*	**ENERGY EFFICIENCY IN THE UNIVERSITY DORMITORY CENTER IN TIRANA**

Project description:

The objective of the proposed project activity is to reduce GHG by introducing different energy efficiency measures at the Student City Dormitory Center.

The Student City in Tirana is the biggest student centre in Albania and consists of 29 dormitories, some dining halls and social cultural buildings.

The total number of residents in the Student City is 8.162, while the number of rooms is 3.000. The average number of residents per room is 3 persons/room. Furthermore, there are in operation 2 libraries, 4 dining halls, the police station, the laundry, the shopping area, and the cinema hall. It should be underlined that, according to the plans for enlarging the areas of Student City, three other buildings and a new cinema hall are ought to be built.

Regarding the Student City location, it should be mentioned that in its vicinity the Faculty of Economics is located, as well as the Faculty of Foreign Languages and the Faculty of History-Geography.

Figure 6. Student City, Centre-boiler houses and Heat-network

The consumption of energy sources in the Student City Dormitory Center is made for providing the following main services:

- space heating,
- cooking,
- lighting,
- hot water preparation for showers and the laundry,
- air conditioning,

- domestic appliances such as: TVs, tape recorders, refrigerators, etc.

The Student City Dormitory Center during its activity uses:

- Electricity,
- Residual fuel oil.
- Coal.

The annual average energy consumption in the Student City for the period 2003-2006 was:

- Electricity – 16.715, 17.551, 18.077 and 18.873 MWh, respectively,
- Residual fuel oil – 862, 914, 932 and 960 tons of residual fuel oil respectively,
- Coal – 3.408, 3.612, 3.720 and 3.880 tons, respectively.

Different energy efficiency measures and introducing efficient technologies will reduce electricity, residual fuel oil and coal consumption.

The possible energy savings measures which could be undertaken in the Student City Dormitory Center are as follows:

Space Heating: Thermal Insulation of all Buildings and Introduction of Double Glass Windows

In the Eastern and Central Europe (including Albania), the energy consumption for space heating in the residential and public buildings is often 2-3 times higher than the similar buildings in the Western Europe, what means that the energy consumption for electricity and space heating is in the range of 250-400 kWh/m^2 per year.

Increasing the thermal insulation level and reducing the losses from natural and mechanical ventilation, can reduce greatly the energy consumption in the buildings.

The possible annual GHG emission reductions by implementing the above mentioned measures could reach the value of 3.150 tons of CO_{2eqv} and could decrease electricity and residual fuel oil consumption by 2968 MWh, 243 tons of coal and 810 tons of RFO, respectively.

Space Heating: Thermal Insulation of all District Heating Pipes

The thermal energy for the heating purposes of all building of Student City Dormitory Center is generated at the Boiler Houses.

During the period until the year 1984, the old boiler house provided space heating for the 11 dormitories, the showers and the laundry. The use of electric heaters, both for space heating and hot water preparation, was strictly prohibited. At the old boiler house were installed two boilers, with a convective heating area of 100 m^2 each.

During the years 1988-1989, the new boiler house of Student City was designed and built. The boiler house consists of five coal-fired boilers. In parallel with the construction of this centre, was reconstructed the entire hot water distribution network with two lines: one line for providing space heating for each dormitory and the other one for providing hot water for showers that would be installed in each floor of the dormitories and the laundries.

Also, during the period 1988-1990, the Government of constructed more than 7 new dormitories in order to face the high flux of students during those years. These dormitories were constructed within a very short period of time and as a result, the space heating installations were of a bad quality, and none of them was operating during that period. Even today, these space heating installations are out of operation.

The new boiler house is an industrial four-floor building and was built in two phases. In the first phase, during the years 1988-1992, three boilers were installed, and in the second phase, during the period 1993-1994, two additional boilers were installed. So, altogether, in the new boiler house are installed five boilers, each has the following parameters:

1. the steam production of 4 tonne/hour,

2. the steam pressure of 13 bar,

3. the steam temperature of 194 ºC.

Based on some simple calculations done at the Student City Dormitory Center, it was calculate that losses from the hot water network reach 50-60% of the demand for thermal energy. So, by reducing thermal losses in the pipelines, energy saving up to 10-12% could be reached. Energy savings in coal and in residual fuel oil are 77 tons and 256 tons, respectively. The possible GHG emission reductions could reach the value of 550 tons of CO_{2eqv}/year.

Space Heating and Domestic Hot Water: Introduction of CHP System

Space heating in the Student City Dormitory Center is present in all the buildings. It is operational during the period 22 November-28 March of each year. In time, space heating with hot water through the relevant boiler houses has started to aggravate.

Therefore, the introduction of the CHP system would have an overall advantage, resulting not only in energy savings but also in GHG emission reductions.

GHG emission reductions in this case could reach the value of 2.400 tons of CO_{2eqv}/year.

Introduction of Efficient Lighting

Another energy efficiency measure which could be undertaken at the Student City Dormitory Center is introduction of new energy efficient lighting system. The calculations related to electricity consumption for lighting were based on the number of lamps in each building, the average lamp power, and the average time of their operation, during the summer and winter periods.

It should be underlined that the highest energy consumption for lighting is during winter months and the lowest consumption is during summer months. By replacement of the existing 60W incandescent lamps with 18W fluorescent lamps, which have a lifespan of 1.000 hours and 8.000 hours, annual reduction of 150 tons of CO_{2eqv} could be achieved.

Introduction of Efficient Equipment

Introduction of efficient technologies could bring annual energy savings of 1.100 MWh, as well as annual reductions of 520 tons of CO_{2eqv}.

Summary of energy savings and GHG reductions:

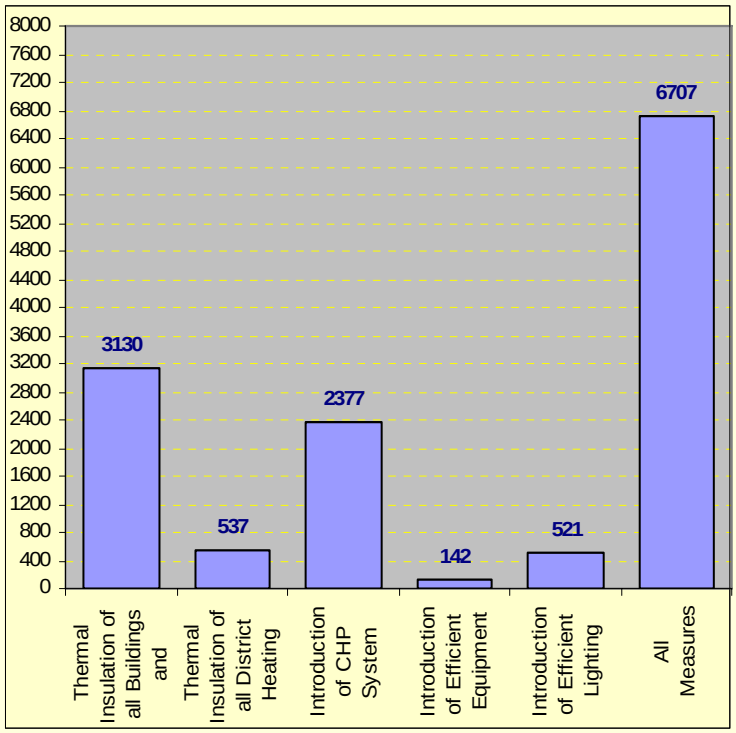


Figure 7. Annual GHG emission reduction of tons of CO2eq at Student City Dormitory Center

Applied methodology

The project activity is small-scale energy efficiency project, with the total saving less then 60 GWhe. The estimation of the emission reduction could be calculated by using the simplified methodology for small scale projects ***"Energy efficiency and fuel switching measures for buildings"*** II.E.

GHG offset

It is estimated that the project has a capacity to avoid GHG emission of nearly ***67.700*** tCO_{2eq} for the period 2008-2018.

Sustainability

The project will considerably contribute to the sustainable development of increasing energy efficiency in the Student City Dormitory Center by mitigating the negative effects which the present are very high related with energy consumption and GHG emissions.

Other benefits by implementation of this project are as follows:

- Improves the national energy efficiency,
- Realize the local electricity production - This reduces technical losses and energy transportation cost,
- Reduces environmental pollution,
- Increase the employment and the expertise by introducing new technologies,
- Increase investments in the public sector.

Current status	Energy Survey and Audit of Boiler Houses of Student City Dormitory Center - Tirana has been performed.
Estimated investment cost	NA
Local partners	Student City – Rr. Pjeter BUDI, Tirane Ministry of Education and Science

Project title *Ref. No. 11*	**REFORESTATION IN KUKES DISTRICT**
Project description:	In Kukes district, there are 54.845 ha of land eligible for afforestation / reforestation under the CDM. The project could take place on communal forestland and pastureland owned by the state but given to communes for use. The main technique applied could be to exclude selected sites from grazing and, in addition, to promote revegetation and planting, on most degraded land, taking into account that majority of the area is, at least in part, covered with grass and shrubs. The most degraded land is the one exposed to uncontrolled grazing, which prevents establishment of protective vegetation cover, and the one exposed to uncontrolled forest harvesting and poor forest management. Assisted natural regeneration of the forests could be achieved through temporary displacement of grazing activities and coppicing of the most degraded plots, while reforestation could be performed through direct planting and / or seeding. Plantations can be harvested in short or long rotations and then regenerated through planting and coppicing. Number of ecological, financial, technical and institutional barriers could be identified and overcome if the project would be realized under the framework of CDM.
Applied methodology	AR - AM0003 – ***"Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing"***.
GHG offset	Cumulative GHG offset calculated for 54.845 ha, which are eligible for CDM reforestation activities, can be **up to *2.084.000*** tCO_2 for the period 2008-2018.
Sustainability	• Appropriate selection of native species would contribute to biodiversity conservation, i.e. it would lead to increase in species diversity, while mosaic habitat formation would enhance habitat diversity; • The project would support sustainable development of rural communities by generating employment opportunities in rural communities with rather high rate of unemployment and by establishing necessary environment for of various forest products; • Result of forest cover and root development would be also reduction of soil degradation, improvements in soil stabilization and soil fertility and enhancement of the water retention capacity of the land.
Current status	The described project activity has been defined according to the data from the existing official documents such as strategies, technology needs, assessments and so on.
Estimated investment cost	It was estimated that 25% of the project area would be suitable for plantations, while the rest would suitable for natural revegetation. In that respect, the cost of afforestation of the project area suitable for plantations would be up to app. 24,5 mil EUR.
Local partners	Directorate of Forestry and Pastures Policies, Ministry of Environment, Forestry and Water Administration

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